HGCA

PROJECT REPORT No. 173

INTEGRATED FARMING SYSTEMS

(a field-scale comparison of arable rotations)

VOLUME II: THE ECONOMIC EVALUATION OF INPUT DECISIONS

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LINK INTEGRATED FARMING SYSTEMS
(a field-scale comparison of arable rotations)
VOLUME II: THE ECONOMIC EVALUATION OF INPUT DECISIONS

by

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PART I

1. SUMMARY

This report outlines the results from a five-year study, which commenced in April 1993. The study was designed to strengthen the economic interpretation of the main integrated Farming Systems project (0068/1/91) by checking the validity of each major input decision. The project was located at four sites: ADAS Rosemaund, Hereford; ADAS Boxworth, Cambs.; ADAS High Mowthorpe, North Yorkshire; Pathhead, Midlothian.

The LINK funded, Integrated Farming Systems experiment compared a conventional rotation with a sustainable, integrated farming system (IFS). The conventional practice reflected local practice of farmers who where 'technically competent, financially aware and risk-averse'. The IFS system incorporated where possible the latest results of research and development to optimise inputs in an 'advanced management system'. The objective was to maintain profitability, while reducing off-farm inputs, by a process of modifying the crop rotation and management techniques to minimise or avoid major pest and disease problems and nitrogen leaching. The validation experiment was designed to check the validity of each major input decision. For each decision made on the IFS rotation, a single factor comparison between the basic IFS and an alternative 'test' treatment was made. This resulted in 87 individual experiments on all sites, spread over six crop types, resulting in a total of 757 comparisons. Assessments were done in each experiment to establish the efficiency of treatments on disease, pest or weed incidence, and to measure yield and crop quality. A financial evaluation was also done.

Trial design began as randomised blocks but the design was altered in 1996 and 1997 to improve the precision (i.e. the power to detect significant differences between treatments). The majority of the trials were α designs (optimal set of incomplete blocks), a few trials were designed with fractional factorial treatment structures. The statistical evolution of the validation experiments over time has allowed the accurate estimation of differences between any two of the treatments. The information on experiment design from this study should be applicable in the wider arable experimentation context and it is recommended that it be considered by other researchers for other projects.

The use of the validation experiment has allowed testing of alternative or 'conventional' treatments. This information can then be used in future years to refine decisions made in the developing IFS system. The inclusion of these trials has provided a valuable management tool in determining the factors limiting further reductions in inputs, and optimising profitable output.

The validation experiment has indicated areas of importance to be considered when developing an Integrated Farming system. Overall, this study demonstrated that the treatment adopted in the LINK-IFS project had been bettered by alternatives selected for test in the validation studies in only 7.0% of cases. Showing that decisions were optimised in the LINK-IFS project in the vast majority of cases. In cereals, variety choice has a key impact on the profitability of the farming system when reducing inputs. Initially, herbicide decisions in the Integrated system moved away from the use of autumn residual herbicides to try and minimise the risk of pesticide leaching, and contact-acting products (with a theoretically lower leaching risk) were used in the spring. The validation experiments demonstrated that where early weed

control was important, then autumn residual herbicides produced better more consistent results. A prediction system to indicate the numbers and species of weeds to be tackled would be a valuable tool in development of an Integrated Farming System. Generally nitrogen rates calculated from use of ADAS Fertiplan and soil nitrogen analysis were optimal for winter wheat, However in the small number of cases where estimates were sub-optimal, yield losses were severe and profitability severely decreased. Nitrogen rates calculated from soil nitrogen analyses were 30 kg/ha too low overall on spring barley at Pathhead.

The fungicide programmes applied within IFS have been optimal, only 6.3% of alternative validation decisions resulted in higher yields than the IFS. There were limited occasions for the use of insecticides but only one validation treatment out of 41 comparisons in wheat lead to a higher yield than the integrated system, this was due to prevention of re-infestation by aphids during grain filling.

Weed control in spring beans was very difficult in the absence of pre-emergence residual herbicides, where opportunities for post-emergence control are limited and expensive. Information on appropriate fungicide dose for disease control in winter beans is limited and more research is required to optimise fungicide inputs and evaluate effects of disease control, which may not always be economically viable in such crops.

Mechanical weeding in potatoes was a successful technique used in most seasons when soil conditions were dry at the time of the first weed flush. It was most successful when used in conjunction with low-dose post-emergence herbicides. There were less opportunities to use mechanical weeding in combinable crops due to the combination of dry soil conditions, small non-tap rooted weeds and early crop growth stage which are required to optimise its effectiveness.

The majority of decisions (93%) made on the winter linseed were correct, but there is a need to increase the information on disease control programmes for winter linseed, a relatively new crop in the UK, to optimise crop output.

The results from the main LINK-IFS report state a non statistically significant production margin difference between the conventional and integrated systems of only £17 /ha. From the validation experiment yield was significantly bettered by alternatives in only 7.0% of cases, but these were not always associated with improvements in gross margin. The results indicate scope for improving the gross margins of the IFS system up to the level of the conventional system, through optimising weed control, better prediction of nitrogen requirements and maximising production from breakcrops. Generally improved decision making is needed to refine Integrated Farming Systems and minimise inputs by allowing better targeting, and better prediction of problem situations, allowing growers to balance risks with the benefit of the best information available. Decision support systems which can give growers more information about the likely risk of decisions would help to give growers confidence about their decision making and allow them to more readily adopt integrated systems. Thresholds used in such systems must be well established and robust if growers are to have the confidence to move to more integrated systems. As well as sophisticated decision support systems, growers also need access to simple biological information about pests and diseases to allow identification and determination of pest and disease levels.

The information from the validation study has quantified the effects of some of the risks taken within the LINK Integrated Farming Systems project. A technique such as the validation study should be used extensively within any field scale experiments with limited replication. The statistical design has been shown to be an important factor in this type of study and the field experimenter and statistician should work closely to optimise benefits from the research.

2. INTRODUCTION

Economic, political and environmental constraints now affect all farming decisions. In an attempt to develop production systems that take account of environmental considerations while maintaining profitability six sites in the UK were used to compare a conventional rotation with an 'Integrated Farming System' (IFS) under a LINK-funded contract (0068/1/91). The objective of the LINK-IFS study was to compare the two systems of production for economic viability and environmental impact on a whole field scale, comparing split fields (Wall, 1992). The IFS system attempted to maximise profitability with a different balance of inputs, directed towards environmental benefits, to those employed on the conventional system (Ogilvy *et al.*, 1994). The split-field comparison used does not supply the information needed to disentangle the contribution of each input to the system as a whole. The contribution of individual components in the management strategy should be assessed and this can only be achieved if the individual components are tested in isolation (Jordan, Hutcheon and Perks, 1990). Detailed information on separate system components should identify areas of particular strength or weakness in the IFS management strategy providing pointers for development and refinement of the IFS system adopted.

3. OBJECTIVES

This study was designed to strengthen the economic interpretation of the LINK-IFS project by checking the validity of each major input decision and to quantify any increase in risk associated with the IFS management system.

i) To validate the crucial decisions, e.g. nitrogen and pesticide input of the LINK-IFS rotation to complement the field investigations.
ii) To measure the effect of these decisions on yield and profitability and strengthen the interpretation of the systems study.

4. DURATION

Five years starting April 1993.

5. MATERIALS AND METHODS

5.1 *Sites*

The project was located at four sites in the UK with a wide geographic spread and range of soil types (Table 1).

Table 1. Location of sites and soil types

Site name	Abbr.	Location	Soil type
ADAS Rosemaund	RM	Lower Hope Farms, Ullingswick, Hereford.	Silty clay loam
ADAS Boxworth	BX	ADAS Boxworth, Boxworth, Cambs.	Clay
ADAS High Mowthorpe	HM	ADAS High Mowthorpe, Duggleby, Malton, North Yorkshire.	Shallow stoney silt clay loam over chalk
Pathhead	PH	SAC, Edinburgh, Rose Mains, Pathhead, Midlothian.	sandy loam/sandy clay loam

5.2 *Treatments*

The LINK funded, Integrated Farming Systems study compared a conventional rotation with a sustainable, integrated farming system (IFS). The conventional practice reflected practice of farmers who where 'technically competent, financially aware and risk-averse'. The IFS system incorporated the latest results of research and development to optimise inputs in an 'advanced management system'. The objective was to maintain profitability, while reducing off-farm inputs, by a process of modifying the crop rotation and management techniques to minimise or avoid major pest and disease problems and nitrogen leaching.

The experimental design of the IFS project made comparisons with half or quarter fields as paired plots, one half managed in an integrated system and the other to local conventional practice (Fig. 1). This experimental design simply compared the two systems without supplying the information required to disentangle the contribution of each input to the system as a whole.

The validation trial plots were superimposed on all crops in the IFS rotation each year (with the exception of the set-aside phase of the rotation). The validation exercise was designed to check the validity of each major input decision. The comparisons generated were of two types:

1. Where the crop was the same in both the conventional and IFS system, an application made to the integrated crop was evaluated within the integrated system, by substituting the 'conventional' input decision for the 'integrated' input decision.
2. In other situations, or where the conventional and IFS crops differed in the same paired-field plots, the IFS decision was compared to possible alternative treatments. The aim of this was to test the effect of further minimising inputs, or evaluate alternative treatment effects on output. In some cases, the alternative treatment was a whole change in strategy, rather than a single change in one input.

Some examples of treatment decisions are shown below:

Possible IFS decision for field area	Validation experiment - small plot treatment
Disease resistant variety (Rosemaund only)	Variety selected for conventional rotation
Nitrogen applied modified according to soil mineral nitrogen level levels in field	Nitrogen applied according to Fertiplan alone (i.e. as conventional practice)
Autumn insecticide not needed due to delayed emergence	Pyrethroid applied as a routine spray
GS 32 fungicide delayed due to low disease pressure	Appropriate rate fungicide applied at GS 32
Flag leaf fungicide applied at appropriate dose based on latest product dose rate information	Recommended rate fungicide based on current local practice
Ear fungicide omitted (dry weather predicted)	Appropriate ear rate spray
No grain aphicide applied (i.e. just below threshold or high parasitic activity)	Grain aphicide applied
No autumn herbicide applied	Autumn residual herbicide

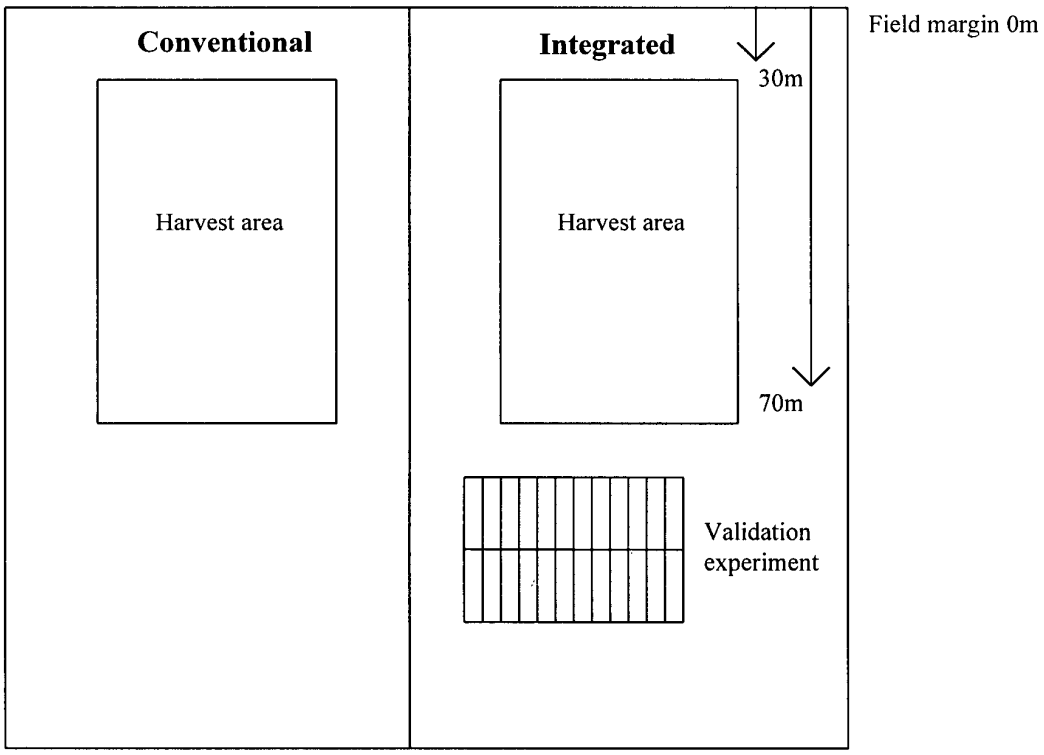

Fig. 1. Typical Layout of validation experiment within the IFS field

5.3 *Experiment design*

At each of the four sites a series of small plot experiments was positioned within each integrated crop of the main LINK-IFS project (Fig. 1). Plot sizes varied between 32.0 m^2 and 72.0 m^2 depending on site and crop. With the exception of the treatment under test all other inputs for each plot were identical to the main IFS study.

For each major input decision made on the IFS rotation, a single factor comparison between the basic IFS and an alternative treatment was made (i.e. a change in dose rate, timing, product or specific strategy (i.e. fungicide or weed control strategy)). The IFS crop management strategy depended upon day-to-day decisions made according to detailed crop monitoring. Treatments under test in this supporting study could not be specified in advance but developed through the season in accordance with disease, pest and weed pressure etc., and crop fertiliser demand. There were 87 experiments in total and these were spread over six crop types. Details of the number of experiments and treatments are in Table 2. The number of comparisons in each crop is a function of the frequency of occurrence of the crop in the IFS rotations of the sites tested, and the normal range of inputs applied to the crop which offer alternative approaches to treatment.

Table 2. Number of trials and treatment comparisons made in IFS crops

Crop	Number of trials	Number of treatments in each category							Total number of comparisons
		Herbs.	Fungs.	Insects.	PGRS	Nitrogen	Varieties	Other*	
Winter wheat	45	99	198	41	51	51	6	2	492
Beans	17	20	34	11	0	0	0	4	83
Potatoes	9	18	10	1	0	5	0	6	48
Linseed	6	13	31	0	1	1	0	0	52
Spring barley	5	9	10	5	0	9	0	4	41
Spring oilseed rape	5	10	11	7	0	5	0	3	41
Total	87	169	294	65	52	71	6	19	757

* includes micronutrients

5.4 *Assessments*

Assessments done were as follows:

i) Yield and crop quality
ii) Disease or pest incidence at time of decision making and again at appropriate timing to establish the efficiency of the treatment.
iii) Financial evaluation of each treatment.

Sprays were applied using Oxford Precision Sprayers, nitrogen was applied by hand or toolkit mounted spreader. Combinable crops were harvested using plot combines, minimum harvest area was 30 m^2. Potatoes were harvested by hand digging (5 x 20 m of row). Grain nitrogen content was measured in all combinable crops. In cereals, specific weight (all cereals), SDS and Hagberg Falling Number (quality wheats) were assessed. At SAC Pathhead, screening levels were assessed on cereals.

Disease and pest incidence were measured using appropriate methods for each crop and disease.

For the financial evaluation, the final gross margin figures were calculated using actual crop selling prices achieved immediately after harvest. Area aid payments were not included and an allowance was made for application costs. The pesticide prices used were the same as those of the main LINK-IFS project representing a mean UK price for inputs calculated from ADAS surveys.

5.5 *Statistical analysis*

The major concern of the IFS validation trials was whether the experimental design was powerful enough to detect small differences in yield between the different treatments from the background variation. It was deemed necessary to detect differences of about 5% due to the sensitivity of profit to yield.

A problem particular to the validation trials was that at the start of the trial the experimenter did not know all the treatments that were to be used. Throughout the season applications were be made to the main IFS trial based on weed, disease and pest pressure. The maximum number of possible treatments was estimated and the experimental plots marked out. In each validation trial, at least one treatment was the control and received the same inputs as the main IFS, all other treatments were compared to this.

From 1993 to 1995 the IFS validation trials were designed using randomised complete blocks i.e. each block contained one replicate of each treatment. For the trials in 1996 and 1997 their statistical design was changed so to improve the precision (the power to detect significant differences between treatments). Improvements were made to both the blocking structure and the treatment structure. As a result the trials were designed using incomplete blocks i.e. each block only contained a subset of the total number of treatments. The improved blocking structure consisted of between 4 and 6 plots per block. Most of the 1996 and 1997 trials were designed using α designs (Patterson *et al.*, 1978) which are an optimal set of incomplete block designs appropriate for these trials.

As an alternative, a few trials were also designed with factorial treatment structures. In an experiment with a factorial structure, the effects of a number of different factors are investigated simultaneously. A factor is a set of treatments that can be applied to the experimental plots. A level of a factor is a particular treatment from the set of treatments which constitute the factor i.e. a factor could be herbicide and the different levels could be (1) none applied, (2) a half rate applied and (3) a full rate applied. The experimental treatment applied to a plot comprises one level from each factor in the experiment. Some of these trials

took the form of fractional factorials as there were more treatment combinations than experimental plots available.

6. RESULTS AND DISCUSSION

Between 1993 and 1997 a total of 87 validation experiments have tested 757 treatments on the LINK-IFS crops. The results of these experiments (Fig. 2) demonstrated the success of the management strategies which have been incorporated into the main IFS study. Overall, the main IFS treatment had been bettered by alternatives in the validation studies in 7.0% of cases, with most of this attributable to alternative fungicide, nitrogen and herbicide decisions to that adopted in the LINK-IFS system.

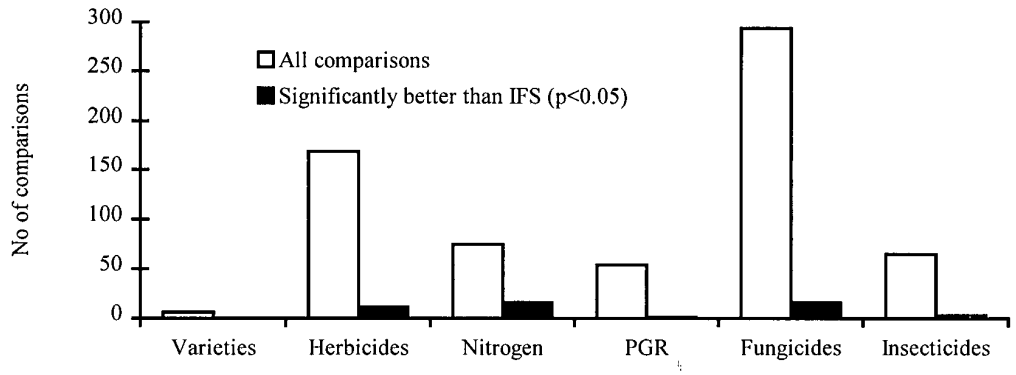

Fig. 2. Total number of validation treatments for all crops, 1993-1997, and the number of treatment with a significant yield increase compared to IFS.

The following results sections have been split into crop type (and the cereals split further into herbicides, fungicides, insecticides, nitrogen and plant growth regulators (PGR) and varieties), to discuss the key findings and help identify strategies to refine and improve the Integrated Farming Systems tested at each site. Preliminary results were reported by Laverick *et al.* (1996).

6.1 *Cereals*

6.1.1 Cereal variety

Within the validation experiments there was little scope to evaluate the choice of variety but this was done for 6 site years at Rosemaund. Within the Integrated Farming System, drilling of wheat at this site was delayed by 1-2 weeks compared to the conventional system following the combinable break crops. This was done to reduce the need for insecticides to control aphid vectors of BYDV, reduce disease pressure principally from *septoria tritici*, reduce lodging risk and increased opportunity for germination of weed seeds prior to drilling. The other wheat in the rotation followed potatoes grown principally for the baking market and therefore tended to be late drilled. It was felt that choosing a variety suitable for later drilling would allow these objectives to be achieved either with no or a positive impact on gross margin. Foulkes *et al.* (1994) identified the speed of development of a variety as being important in

determining its response to sowing date. Soissons was the variety selected for the IFS system due to its short phyllochron (Foulkes *et al.*, 1994) and low photoperiod response (Worland *et al.*, 1994) both of which imply fast development. It also possesses good agronomic characteristics which suited it to the integrated system namely; good resistance to the main diseases at the site (*septoria tritici* and mildew), early maturity and market demand for the grain. In the validation experiment Soissons was replaced by Brigadier, the variety grown in the conventional treatment, this variety then received all applications made to the IFS. In 5 out of 6 years the Brigadier yielded less and sometimes significantly so (Table 3). In low disease years, 1995 and 1996 (Hardwick *et al.*, 1997), the Brigadier yielded similarly but did not receive any of the milling premiums and was therefore less profitable than the Soissons. In the high disease year, 1997, the Brigadier yielded significantly less (up to 2.8 t/ha), specific weight, thousand grain weight and SDS were all significantly lower also. Growing Brigadier under an integrated system resulted in a mean decrease in gross margin of £121. Clearly variety choice has a key impact on the profitability of the farming system when reducing inputs.

Table 3. Variety choice, grain yield and gross margin, Rosemaund 1995-1997

	Treatment	Yield t/ha	GM £/ha	SPWT kg/hl	TGW g	Protein %	HFN	SDS
1995	Soissons	5.39	467	81.4	37.8	13.8	361	70.5
	Brigadier	5.86	495	**77.2**	39.7	**12.2**	**306**	**53.3**
1995	Soissons	6.45	544	82.7	42.9	13.9	358	71.1
	Brigadier	6.41	509	**75.4**	41.2	**12.9**	**310**	**47.5**
1996	Soissons	9.50	897	80.9	41.8	-	-	-
	Brigadier	**9.08**	**693**	**75.2**	40.9	-	-	-
1996	Soissons	8.75	844	74.6	39.2	-	-	-
	Brigadier	**8.46**	**665**	**70.9**	39.9	-	-	-
1997	Soissons	7.00	384	73.9	40.6	11.4	218	94.9
	Brigadier	**4.20**	146	**62.8**	**33.7**	11.4	**164**	**67.6**
1997	Soissons	7.48	448	72.4	41.0	11.4	253	91.9
	Brigadier	**6.32**	**347**	**64.3**	**36.9**	**11.0**	238	**58.6**

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level.

6.1.2 Weed control in cereals

Herbicide strategies in the IFS included the use of mechanical weeders. Due to the design of the LINK-IFS experiment and the location of the validation experiments it was not always possible to avoid the validation plots when the mechanical weeder was used on the main crop. Any test comparisons for herbicide programs therefore included mechanical weeding if used across the whole LINK-IFS field plot. The interaction of mechanical weeding and herbicide program was the basis of a further LINK funded study (Blair *et al.*, 1995). Site objectives in

many IFS cereal crops was to avoid the use of autumn residual herbicides to minimise risk of pesticide leaching and to rely on contact products used in the spring in combination with a mechanical weeder. In the absence of high weed numbers or pernicious grass weeds this approach had been satisfactory in the early years, but at sites where weeds became a problem, the decision to omit an autumn herbicide resulted in a reduction in crop yield. This confirms similar findings (Proven *et al.*, 1991; Cook & Clarke, 1997), where it has taken about three years for weed numbers to increase under reduced herbicide regimes.

In winter wheat, there were 99 validation treatments done on weed control, of these there were only seven in which the validation trial treatment resulted in a significantly higher yield than the IFS treatment, thus reflecting a correct choice in the vast majority of cases (Table 4).

Table 4. The effect of a change in herbicide strategy resulting in a significant ($p<0.05$) yield increase and the increase in gross margin.

Year	Site	Variety	IFS programme	Validation treatment	Yield response (t/ha)	GM response* (£/ha)
1994	BX	Spark	bromoxynil (200 g ai/ha) + ioxynil (200 g ai/ha) + mecoprop-P (800 g ai/ha) April	**alternative program** isoproturon (1950 g ai/ha) + diflufenican (50 g ai/ha) March	0.24	7
1995	RM	Soissons	metsulfuron-methyl (4 g ai/ha) + fluroxypyr (60 g ai/ha) April	**alternative program** diflufenican (50 g ai/ha) + isoproturon (500 g ai/ha) Autumn	1.25	**130**
1995	PH	Hunter	benazolin (50 g ai/ha)+ bromoxynil (125 g ai/ha)+ ioxynil (62.5 g ai/ha) + fluroxypyr (100 g ai/ha) April	**alternative program** isoproturon (900 g ai/ha) + trifluralin (600 g ai/ha) diflufenican (50 g ai/ha) + isoproturon (500 g ai/ha) Autumn	0.72	**78**
1996	HM	Hereward	fluroxypyr (150 g ai/ha) May	**alternative program** bromoxynil (200 g ai/ha) + ioxynil (150 g ai/ha) + diflufenican (37.5 g ai/ha) Nov.	2.71	**285**
1996	PH	Hunter	No autumn herbicide	**additional herbicide** diflufenican (50 g ai/ha) + isoproturon (500 g ai/ha) Nov.	0.41	**49**
1997	BX	Reaper	mecoprop-P (1380 g ai/ha) + bromoxynil (250 g ai/ha) + ioxynil (250 g ai/ha) April	**reduced herbicide level** mecoprop-P (1380 g ai/ha) April	0.23	**23**
1997	RM	Soissons	isoproturon (500 g ai/ha) Feb.	**Alternative herbicide** diflufenican (40 g ai/ha) + isoproturon (1000 g ai/ha) Feb.	0.41	**25**

* NB: Figures in bold are significantly different from the Integrated treatment at the 5% level.

Overall, most yield increases (6 out of 7 occasions) were seen where a pre- or post-emergence residual herbicide was applied rather than a spring applied contact herbicide. The residual herbicides used tended to be active on grasses and were also applied earlier in the season, prior to weed emergence, or when weeds were at the seedling growth stages when more susceptible to control. If the alternative program had been followed in the integrated system then the mean gross margin increase would have been £52/ha (Table 4).

Table 5. 1995 ADAS Rosemaund, Field name: Barnfield - winter wheat, estimated weed population, nos./m², GS 69, 16 June 1995

Treatment	AMG	Wild oats	Cleavers	Chickweed	Pansy	Vol. OSR	Vol. Potato
AS IFS, Appendix 11	47.5	0.4	0.2	0.0	28.8	0.1	0.8
diflufenican (50 g ai/ha) + isoproturon (500 g ai/ha) Autumn	**1.0**	0.3	0.2	0.0	**0.5**	0.0	0.3

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level.

At Rosemaund in 1995 use of an autumn residual herbicide significantly increased yield. The integrated treatment was mechanically weeded on 15 April, the operation having been delayed by a combination of poor soil structure associated with the preceding potato crop, and high winter rainfall that caused waterlogging in the early spring. In addition there were high numbers of weeds in the spring (Table 5). The combination of this delay and the decision to use low rates of metsulfuron-methyl + fluroxypyr resulted in a significant yield and gross margin increase from the addition of an additional autumn residual herbicide; diflufenican + isoproturon (Table 4). Reliance on mechanical weeding alone in the integrated treatment would have resulted in an even greater yield loss and financial penalty. This reliance on accurate timing of inputs or operations highlights the reduced level of insurance in such systems. This result was surprising. Previous work has rarely shown a response to controlling such populations of annual meadow grass (Sherrott, 1987) and pansy (Wilson & Wright, 1990). It is therefore suggested that in this case, the timing of control was an important criteria, rather than the product choice.

At Pathhead, in 1995, heavy rainfall delayed the spring herbicide application and allowed the continued development of volunteer oilseed rape (20.0 /m²). This delay meant that the application of benazonil + bromoxynil + ioxynil + fluroxypyr was not enough to reduce weed competition to a level which would not reduce yield (Table 4), whereas the autumn applied herbicides controlled the rape). In 1996, application of 500 g a.i./ha isoproturon + 50 g a.i./ha diflufenican resulted in good annual meadow grass control, a higher yield and gross margin, the advantages of this early weed control were enhanced by wet weather again delaying application of the spring herbicide. In these situations the yield response due to the addition of an autumn residual herbicide was greater than would normally be expected on this site.

At sites where grass weed populations are lower but where broad-leaf weed populations can be high, for example at High Mowthorpe, a combination of low rates of contact herbicides and mechanical weeding or mechanical weeding alone were employed with good effect. In 1995, the IFS strategy was to apply diflufenican (50 g a.i./ha) + isoproturon (500 g a.i./ha) (IPU/dff) in the autumn followed by mecoprop-P (480 g a.i./ha) + fluroxypyr (100 g a.i./ha) in the

spring. The addition of a further 50% to the rate of the autumn product to bring the application rate up to that of the conventional had no significant effect on weed numbers, crop yield or profitability. The avoidance of any autumn herbicide, relying on the contact spring applied herbicides and mechanical weeding alone in 1995 also did not adversely affect crop yield but significantly improved the gross margin (Table 6). In 1996, season long control of weeds was achieved by application of an autumn residual herbicide in the validation experiment (Table 7). The spring applied fluroxypyr in the integrated system was unable to effectively control the vigorous flush of weeds, the application had been delayed by poor weather conditions. A late application of metsulfuron-methyl had controlled the chickweed which developed rapidly in wet spring conditions, but there was no yield response, most of the weed competition damage having already been done. The temptation to use such 'fire brigade' tactics in difficult situations can lead to increased herbicide input and further losses in profitability of the crop currently in the ground. However, this experiment was not able to measure the impacts of allowing seed return on future crops.

Table 6. 1995 ADAS High Mowthorpe, winter wheat cv Hereward, herbicide programme, grain yield and weed populations

Treatment	Yield (t/ha)	Gross margin (£/ha)	*Avena fatua* (/m²)	*Poa annua* (/m²)
IFS	8.18	1066	0.3	0.5
+ dff (25 g a.i./ha) + IPU (250 g a.i./ha)	8.25	1069	0.3	0.5
- dff (50 g a.i./ha) + IPU (500 g a.i./ha)	8.44	1118	0	0.5
SED (df)	0.135 (27)		NS	NS
CV%	2.3			

Table 7. 1996 ADAS High Mowthorpe, winter wheat cv Hereward, herbicide programme, grain yield and weed populations.

Treatment	Yield (t/ha)	Chickweed (% ground cover)	Speedwell (% ground cover)	Mayweed (% ground cover)
IFS - fluroxypyr (150 g ai/ha) April	6.39	52	75	33
bromoxynil (200 g ai/ha) + ioxynil (150 g ai/ha) + diflufenican (37.5 g ai/ha) Nov.	**9.10**	0	1	1
metsulfuron-methyl, late season	6.31	45	68	22

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level.

The validation treatments demonstrate that when early control of mainly annual grass weeds and sometimes broad-leaved weeds was required, autumn residual herbicides, generally produced better, more consistent weed control, higher yields and gross margins than a sequence of purely contact products (predominantly spring-applied) and mechanical weeding (Table 4). This was particularly apparent where weed populations were high, where there was

an annual grass weed problem and where spring applications were delayed. In addition, herbicide programs that relied on mechanical weeding and low dose spring herbicides were dependent on good ground conditions early in the spring for optimum weed control from the mechanical weeding. Previous cropping and soil type therefore assumed even greater importance in the IFS decision process, to maintain a good soil structure. The difficulty in optimising the spring weed control strategy is an important area of future concern. From a wildlife point of view, overwintering weeds may be of value. However, this work clearly shows that it is important to know how many weeds and of which species in the overwinter period may cause yield loss, and have the ability to robustly remove them in the spring.

There is a need to develop weed prediction systems; this has been done on a limited basis in the LA Life project. Here, soil samples are taken pre-drilling, placed in trays in a glasshouse and a record made of the number and species of weed seedlings, these data were then used as an aid to herbicide choice (Farmer *et al.*, 1997). This system has limitations as some weeds may not germinate, and results may not be available prior to the application of a pre-emergence residual herbicide. Any prediction of weed risk is of value. Further discussion of weed control within the main IFS experiment can be found in the paper by Coutts and Prew (1996) and the final report.

6.1.3 Nitrogen and plant growth regulators

Within the IFS project, nitrogen inputs for the integrated treatments were calculated to match crop and yield expectations. The estimate of yield was made by each site for each crop, based on previous experience. This was then amended according to the measured level of available soil mineral nitrogen present in the spring. Where the application rate was lower than the conventional system, the conventional rate was applied as a test treatment on the validation plots. Additional treatments to examine the effects of application rate, date and nitrogen source on grain protein content were applied to bread making wheats.

In 98% of cases, the validation trials support the nitrogen fertilisation strategy employed in the Integrated Farming System. The nitrogen rates have generally been optimised in winter wheat, but have been consistently 30 kg/ha too low in spring barley in Scotland, leading to significant ($p<0.05$) reductions in gross margin by a mean of £53/ha (Table 8). At Pathhead, the heavier clay soils at Rose Mains farm (as opposed to lighter textured soils at Turniedykes Farm) tended to show a greater response to extra applied nitrogen in all crops tested. The site manager was possibly a little too 'risk averse' in setting nitrogen rates for spring barley crops at Rose Mains (but not Turniedykes), as the soil mineral nitrogen data tended to show low levels of available nitrogen in the Rose Mains fields. The greatest financial risk in the Pathhead rotation would have been the loss of the large malting premiums that were achieved regularly (every LINK-IFS spring barley crop gained a premium over the five years), but also the LINK-IFS margins could have been improved if a little more nitrogen had been applied.

In situations where significant ($p<0.05$) yield responses to additional nitrogen have occurred, these have generally resulted from extra nitrogen applied as part of the main dressing in May (Table 9). In these situations, grain protein contents were increased, whilst Hagbergs were generally unaffected. Gross margins were not significantly ($P<0.05$) affected in four out of seven cases, on average the increase in gross margin from the additional nitrogen was £43.

Table 8. Significant (P<0.05) yield responses where additional nitrogen and plant growth regulator treatments were applied to spring barley; and their effect on gross margin and grain nitrogen content - Pathhead

Year	Farm	Variety	Validation treatment	Yield response (t/ha)	GM response * (£/ha)	Grain nitrogen content (%)	
						IFS	Validation
1993	Turniedykes	Chariot	+ 30 kgN/ha as 34.5% solid	0.62	**49**	1.47	1.50
1993	Turniedykes	Chariot	+ 30 kgN/ha as 34.5% solid + 2-chloroethylphosphonic acid 305 g ai/ha + mepiquat chloride 155 g ai/ha	0.74	**51**	1.47	1.36
1994	Rose Mains	Chariot	+ 30 kgN/ha as 34.5% solid	0.52	**65**	1.74	1.75
1995	Rose Mains	Chariot	+ 30 kgN/ha as 34.5% solid	0.54	**79**	1.38	1.43
1995	Rose Mains	Chariot	+ 30 kgN/ha as 34.5% solid + 2-chloroethylphosphonic acid 305 g ai/ha + mepiquat chloride 155 g ai/ha	0.93	**129**	1.38	1.51
1996	Turniedykes	Chariot	+ 30 kgN/ha as 34.5% solid	0.28	**32**	1.47	1.92
1996	Turniedykes	Chariot	+ 30 kgN/ha as 34.5% solid + 2-chloroethylphosphonic acid 305 g ai/ha + mepiquat chloride 155 g ai/ha	0.28	**20**	1.47	1.95
1997	Turniedykes	Chariot	+ 30 kgN/ha as 34.5% solid	0.53	**37**	1.40	1.41
1997	Turniedykes	Chariot	+ 30 kgN/ha as 34.5% solid + 2-chloroethylphosphonic acid 305 g ai/ha + mepiquat chloride 155 g ai/ha	0.48	15	1.40	1.52

*NB: Figures in bold are significantly different from the Integrated treatment at the 5% level.

Table 9. Occasions of significant (p<0.05) yield responses to additional nitrogen and its effect on gross margins

Year	Site	Variety	Validation treatment	Yield response (t/ha)	GM response* (£/ha)
1994	RM	Soissons	+ 30 kgN/ha as 46% foliar, GS 39	0.49	50
1994	PH	Hunter	+ 40 kgN/ha as 34.5% solid, May	0.78	**92**
1996	BX	Consort	+ 40 kgN/Ha as 46% foliar, July	0.26	7
1996	HM	Hereward	+ 72 kgN/ha as 34.5% solid, May	0.81	**59**
1996	PH	Hunter	+ 40 kgN/ha as 34.5% solid, May	0.72	**64**
1997	BX	Reaper	+ 20 kgN/ha as 34.5% solid, May	0.30	12
1997	BX	Soissons	+ 115 kgN/ha as 34.5% solid, May	0.39	7
1997	BX	Reaper	+ 130 kgN/ha as 34.5% solid, May	1.63	**72**

*NB: Figures in bold are significantly different from the Integrated treatment at the 5% level.

At Boxworth, throughout the duration of the experiment, soil mineral nitrogen levels increased due to a combination of dry winters and droughty summers (Fig 3). In 1997, the discrepancy between traditional methods of estimating fertiliser rates and using information from mineral nitrogen sampling resulted in large differences in predicted optimum nitrogen rate, this difference was applied as a validation treatment (Table 9). However, in 1997 the soil nitrogen was not well utilised by the crop and yields were lower in the Integrated system.

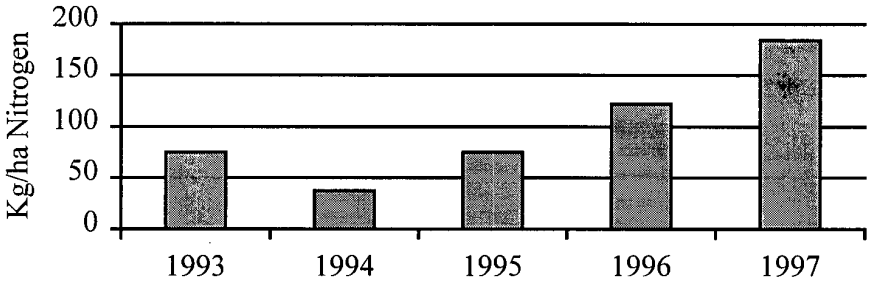

Fig. 3. ADAS Boxworth, spring soil nitrogen levels 1993-1997

The nitrogen strategy at Rosemaund in most cases involved applying 30 kg/ha N as foliar urea at GS 72 to increase grain protein level (Table 10). The validation treatments supported this approach, showing that the use of foliar urea at Rosemaund has resulted in higher grain protein levels than where 30 kg/ha ammonium nitrate (34.5%) was applied in the spring. In 1994, ammonium nitrate was applied in May and its uptake was aided by moist soil. Grain protein content was raised as successfully as with foliar urea. Similar increases in protein content to the application of nitrogen as foliar urea had been observed at other sites (Table 10). The true benefits of this within IFS are site dependent. On sites of lower yield potential, (where grain protein content was not diluted by high yield) the increase in grain protein achieved by use of foliar applied nitrogen did not have significant economic benefit (Table 10). Generally for late 'protein specific' applications e.g. 'milky ripe', nitrogen as a foliar spray is generally regarded as better than as a solid as the risks of insufficient moisture to get it into the crops are minimised.

Measuring soil mineral nitrogen levels to modify the amount of externally applied nitrogen has proved a useful tool in the majority of cases, but the method has its limitations in some situations. In many of these the cost of the test itself is not covered by any savings made in nitrogen applications. However, in some cases use of the technique in the IFS system resulted in significant savings in nitrogen use on cereals (Table 9). The ability to identify those cases in which this technique does not work or costs are not covered need to be identified, a possible addition would be the use of sap/ leaf tests or by canopy management (HGCA, 1997). Any technique used must be quick and cheap to ensure use by farmers and trade.

Table 10. The effect of late nitrogen applications on yield, gross margin and quality of winter wheat

Year	Site	Variety	Treatment	Yield t/ha	GM £/ha	SPWT Kg/hl	TGW g	Protein %	HFN	SDS
1994	RM	Soissons	AS IFS, Appendix 7	9.19	724	80.5	44.4	9.9	347	83.8
			+ 30kgN/ha as 34.5% solid @ GS39,	**9.68**	774	81.0	44.1	10.0	338	84.0
			- 40 kgN/ha as 46% foliar, June							
			- 40 kgN/ha as 46% foliar, June	9.30	750	80.1	42.5	**9.2**	**330**	**77.5**
1994	RM	Soissons	AS IFS, Appendix 8	9.58	861	81.8	44.1	10.2	346	88.5
			+30kgN/ha as 34.5% solid @ GS39,	9.67	880	81.7	43.0	10.3	361	88.3
			- 40 kg/ha as 46% foliar, June							
			- 40 kg/ha as 46% foliar, June	9.38	751	81.3	43.0	9.9	343	83.5
1994	RM	Soissons	AS IFS, Appendix 9	8.72	796	80.6	44.1	10.1	340	79.1
			+30kgN/ha as 34.5% solid @ GS39,	9.28	766	80.5	43.6	10.0	333	79.3
			- 40 kg/ha as 46% foliar, July							
			- 40 kg/ha as 46% foliar, July	8.10	661	80.2	43.9	**9.4**	345	**72.3**
1994	HM	Hereward	As IFS, Appendix 57	9.00	1208	79.0	-	12.1	295	-
			+ N as 46% foliar, June	8.99	1188	79.6	-	**12.6**	305	-
1995	RM	Soissons	AS IFS, Appendix 11	5.39	467	81.4	37.8	13.8	361	70.5
			+ 40kgN/ha as 34.5% solid @GS 33,	5.71	500	82.1	38.4	**14.8**	365	**76.8**
			- N as 46% foliar, June							
			- N as 46% foliar, June	5.79	530	82.7	39.2	**12.7**	361	70.0
1995	RM	Soissons	AS IFS, Appendix 14	6.45	544	82.7	42.9	13.9	358	71.1
			+ 40kgN/ha as 34.5% solid @GS 33,	6.83	586	82.6	42.7	13.1	355	69.0
			- N as 46% foliar, June							
			- N as 46% foliar, June	6.50	566	82.3	41.6	**12.5**	354	**67.0**
1995	BX	Cadenza	As IFS, Appendix 39	6.23	422	69.4	43.7	11.3	266	76.5
			+ 20 kgN/ha as 34.5% solid	6.49	424	69.8	42.6	11.3	**281**	76.0
			+ 40 kg/ha Foliar N as urea, GS 71	6.32	413	65.2	43.6	**11.7**	276	77.5
1996	BX	Consort	As IFS, Appendix 40	10.12	917	78.3	40.1	10.4	309	49.0
			+ 40 kgN/ha as 46% foliar, 11.7.96	**10.38**	**954**	78.5	40.2	11.0	310	52.3
1996	BX	Hussar	As IFS, Appendix 41	8.57	806	79.1	42.3	9.1	398	5.97
			+ 40 kgN/ha as 46% foliar, July	8.58	789	79.7	43.9	9.6	341	5.82
1996	BX	Soissons	As IFS, Appendix 42	9.16	1073	4.44	40.5	10.6	363	81.1
			+ 40 kgN/ha as 46% foliar, July	9.39	1052	4.44	39.9	**11.3**	350	83.2
1997	RM	Soissons	AS IFS, Appendix 22	7.00	383	73.9	40.6	11.4	218	94.9
			+ 40kgN/ha as 34.5% solid	7.14	376	73.6	40.4	11.5	223	93.8
			+ 40kg kgN/ha as 46% foliar, June	7.19	380	73.7	40.1	**11.8**	200	97.4

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level.

The nitrogen application recommendations were based on best knowledge at the time, since completion of the project, new research has shown that the key factors in determining N requirement are soil type, soil nitrogen supply and the amount of over winter rainfall,

expected yield for winter wheat is no longer used (Anon, 1998). However even the best interpretation systems are not precise and viewed retrospectively errors of +/- 40 kgN/ha are quite common, on this basis the majority of the nitrogen rates used in the LINK-IFS project were correct. Healthy crops use N more efficiently than ones affected by pests, diseases or weed infestations, thus if any of the IFS treatments resulted in a crop which was not entirely 'healthy' then its use of applied N would be impaired and as a consequence responses to 'extra' N are not unexpected.

Table 10. The effect of late nitrogen applications on yield, gross margin and quality of winter wheat (cont'd)

Year	Site	Variety	Treatment	Yield t/ha	GM £/ha	SPWT Kg/hl	TGW g	Protein %	HFN	SDS
1997	RM	Soissons	AS IFS, Appendix 23	7.48	448	72.4	41.0	11.4	253	91.9
			+ 40kgN/ha as 34.5% solid	7.51	431	72.9	41.1	**11.6**	260	90.0
			+ 40kg kgN/ha as 46% foliar, June	7.46	427	72.2	41.1	**11.7**	249	90.6
1997	BX	Reaper	As IFS, Appendix 46	8.07	514	75.2	36.3	9.4	291	45.3
			+40 kgN/ha as 46% foliar, July	9.60	**587**	74.7	38.0	8.8	274	43.1
1997	BX	Consort	Integrated as Appendix 49	7.02	358	77.2	31.9	**10.6**	340	-
			+ 40 kgN/ha as 46% foliar, 4.7.97	6.92	**331**	77.4	32.2	**10.9**	340	-
1997	BX	Reaper	As IFS, Appendix 50	8.65	539	74.5	41.2	10.4	314	46.7
			+ 40 kgN/ha as 46% foliar, 11.7.97	8.81	531	74.6	42.0	**10.9**	323	50.8

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level.

6.1.4 Fungicides

There were no set targets for pesticide reduction in the IFS rotation; all application decisions were based on detailed crop assessment, disease level, variety choice, weather conditions and the potential end market. The IFS approach did take advantage of application rates at less than the manufacturers full recommended rate as did the conventional system, according to good local practice. The validation plots have demonstrated that the development of the fungicide programmes within the IFS have been successful. There were 198 comparisons of cereal fungicide strategies of which only 13 (6.3%) resulted in significantly ($p<0.05$) greater yields than the IFS (Table 11). If these decisions had been used in the integrated system then gross margins could have been, on average, £31 higher (Table 11). Alternative treatments to the LINK-IFS fungicide strategy have consisted of:-

i) Fungicide application at timings omitted in the main IFS approach (Effects of timing).
ii) The exclusion of fungicides applied to the main IFS plot (Effects of omission).
iii) The choice of a different product (Effect of product choice).
iv) Alternative products at a rate and timing that is common conventional practice (effects of strategy; combination of 1, 2 and 3).

These alternatives have allowed verification of most applications made to the main IFS treatment.

At Pathhead, in Scotland, where disease pressure is low, validation treatments demonstrated potentially greater saving in fungicide application compared to a high disease pressure site such as Rosemaund. In the 5 years of the project there had only been a significant yield loss in one year when a flag leaf fungicide had not been applied. Additionally, positive yield responses to stem extension or ear fungicides were rare (Table 11).

At Boxworth, which is also a low disease pressure site, there have been no significant yield effects due to the application of ear fungicides to wheat (Table 11). In 1993, leaf diseases reached relatively high levels (Table 12) but the addition of chlorothalonil at GS 39 resulted in persistent disease control through the season, with control of brown rust and septoria. A similar result was seen in 1996 on the variety Consort. Low disease pressure sites provided greater scope for large reductions in fungicide use within an integrated system where rotation, variety choice and drilling dates were optimised.

A key selection criterion for all IFS wheat varieties was a good disease resistance profile. The requirement for an early fungicide application can be reduced by choice of variety to suit the disease pressure experienced at the site (Griffin, 1994). The selection of these varieties has resulted in only three incidences out of 198 where yield would have been increased by the addition of an early stem extension spray. These were in 1994, 1995 and 1996 at Boxworth and Rosemaund where the application of a stem extension spray has lead to early septoria control and where prochloraz has been used, control of eyespot.

Additional epoxiconazole or tebuconazole at GS 39 or GS 65 has resulted in yield increases in 4 site years. These yield responses were probably due to a response to the higher dose rate coupled with an increase in green leaf area retention (Table 11).

Varietal choice and the management of fungicide input according to varietal response is key to successful crop management and is well demonstrated in these experiments. The ADAS/CSL Winter Wheat Disease Surveys coupled with the CSL Pesticide Usage Surveys (Thomas *et al.*, 1997) clearly show that many farmers (mainly the smaller farm units) do not vary their fungicide input according to the disease resistance ratings of the varieties being grown. The larger farm units, who tend to specialise in combinable crops and be technically better informed, do make more use of varietal resistance in determining the fungicide requirement of crops. The experiments here clearly demonstrate that large reductions in fungicide input can be made if fungicides are targeted according to disease risk and varietal response. The use of Soissons and Hereward in particular allowed savings in fungicide inputs compared with conventional feed or biscuit varieties which, although higher yielding, usually require a higher fungicide input. The lack of response to stem extension sprays is probably related to a number of linked factors which need to be considered when making decisions on fungicide input at this timing:

1. Eyespot risk. This is related to a number of factors:

i) Date of sowing. Early drilling favours the disease, later drillings are less affected.

ii) Rotation. Cereals in close rotation are at higher risk.

iii) Variety. Most varieties have only moderate resistance to the disease, some, notably Soissons and Brigadier, are more susceptible than other current varieties.

iv) Disease threshold for treatment. A threshold of 20% penetrating lesions is a robust threshold for treatment but does not guarantee a response to treatment. Future

development depends on future weather conditions which can vary considerably. Eyespot risk in 1994 and 1995 was low.

2. *Septoria tritici* risk. The response to treatment at GS31/32 is dependant on subsequent weather conditions. In wet seasons the early treatments can be very important in preventing inoculum establishing in the middle of the canopy - allowing more flexibility in timing and dose of the main flag-leaf treatment.

The lack of yield response to ear sprays is as expected. However, ear sprays can be important in improving grain appearance which can affect the saleability and premium level of grain. Ear sprays can give yield responses when the flag leaf dose is sub-optimal.

Table 11. Details of validation treatments that resulted in significant ($p<0.05$) yield increases and the effect on gross margin

Year	Site	Variety	IFS programme	Validation treatment	Yield increase (t/ha)	GM change * (£/ha)
1993	BX	Soissons	propiconazole (92.5 g ai/ha) GS 39 propiconazole (62.5 g ai/ha) + mancozeb (1600 g ai/ha) GS 59	**alternative program** propiconazole (100 g ai/ha) + chlorothalonil (500 g ai/ha) GS 39 propiconazole (62.5 g ai/ha) + carbendazim (250 g ai/ha) + maneb (1600 g ai/ha) + sulphur (500 g ai/ha) GS 59	0.34	11
1993	BX	Soissons	propiconazole (92.5 g ai/ha) GS 39 propiconazole (62.5 g ai/ha) + mancozeb (1600 g ai/ha) GS 59	**alternative program** propiconazole (100 g ai/ha) + chlorothalonil (500 g ai/ha) GS 39 propiconazole (125 g ai/ha) + fenpropimorph (375 g ai/ha) GS 59	0.46	21
1994	RM	Soissons	propiconazole (125 g ai/ha) GS 39	**plus** propiconazole (93.8 g ai/ha) GS 33	0.48	29
1995	BX	Soissons	propiconazole (125 g ai/ha) GS 39 tebuconazole (62.5 g ai/ha) GS 75	**plus** prochloraz (405 g ai/ha) GS 31	0.84	**60**
1995	PH	Hunter	fenpropidin (225 g ai/ha) + cyproconazole (27 g ai/ha) GS 31 tebuconazole (77.5 g ai/ha) + chlorothalonil (335 g ai/ha) GS 39	**minus** GS 31 spray	0.65	**86**
1996	BX	Consort	epoxiconazole (62.5 g ai/ha) GS 39	**plus** prochloraz (405 g ai/ha) GS 32	0.27	2
1996	BX	Consort	epoxiconazole (62.5 g ai/ha) GS 39	**plus** chlorothalonil (500 g ai/ha) GS39	0.24	13
1996	RM	Soissons	epoxiconazole (50 g ai/ha) GS 39	**plus** cyproconazole (48 g ai/ha) + prochloraz (320 g ai/ha) @ GS 33	0.54	31
1996	RM	Soissons	epoxiconazole (50 g ai/ha) GS 39	**plus** epoxiconazole (87.5 g ai/ha) GS 39	0.46	**43**
1996	RM	Soissons	epoxiconazole (50 g ai/ha) GS 39	**plus** epoxiconazole (31.3 g ai/ha) + fenpropidin (225 g ai/ha) + carbendazim (150 g ai/ha) at GS 65	0.56	**36**
1997	HM	Hereward	tebuconazole (125 g ai/ha) GS 32 epoxiconazole (62.5 g/ai/ha) GS 39	**plus** chlorothalonil (500 g ai/ha) GS 32 chlorothalonil (500 g ai/ha) GS 39 tebuconazole (62.5 g ai/ha) + carbendazim (62.5 g ai/ha) GS 68	0.26	-1
1997	RM	Soissons	epoxiconazole (50 g ai/ha) GS 39	**plus** epoxiconazole (93.8g ai/ha) + fenpropidin (225g ai/ha) GS 39	0.58	31
1997	RM	Soissons	epoxiconazole (50 g ai/ha) GS 39	**plus** tebuconazole (100 g ai/ha) + carbendazim (150 g ai/ha) GS 65	0.68	38

*NB: Figures in bold are significantly different from the Integrated treatment at the 5% level.

Table 12. Disease levels at ADAS Boxworth on winter wheat cv. Soissons, 1993 (GS 65)

Treatment	Yield increase (t/ha)	*S.triticii* leaf 2 (%)	Brown rust leaf 2 (%)	GLA leaf 3 (%)
IFS treatment propiconazole (92.5 g ai/ha) GS 39 propiconazole (62.5 g ai/ha) + mancozeb (1600 g ai/ha) GS 59	-	9.5	21.5	0.7
propiconazole (100 g ai/ha) + chlorothalonil (500 g ai/ha) GS 39 propiconazole (62.5 g ai/ha) + carbendazim (250 g ai/ha) + maneb (1600 g ai/ha) + sulphur (500 g ai/ha) GS 59	0.34	3.7	13.0	3.0
propiconazole (100 g ai/ha) + chlorothalonil (500 g ai/ha) GS 39 propiconazole (125 g ai/ha) + fenpropimorph (375 g ai/ha) GS 59	0.46	3.6	8.0	9.5

6.1.5 Insecticides

Insecticides were not routinely applied and pest incidences throughout the duration of the trial were low. Forty-one insecticide treatment comparisons were made but only one of these resulted in significantly higher yields than the IFS (0.25 t/ha). This was at High Mowthorpe, in 1995, and was due to prevention of re-infestation by aphids. The use of 2 low doses of pirimicarb controlled the early influx of this pest.

The low incidence of yield responses to insecticide treatment in these experiments generally indicates that when pest pressure is low, there is considerable scope for reducing insecticide inputs on the basis of thorough and timely pest monitoring. Reductions in insecticide use can be achieved either through omitting treatments altogether (e.g. Oakley & Walters, 1994) or, in specific circumstances, through reducing insecticide dose rates. The latter course of action can be appropriate for cereal aphids (*Sitobion avenae* F. and *Metopolophium dirhodum* Walker) infesting winter wheat in the summer, where it has been shown that reduced rates of selective aphicides can be effective when aphid parasitoid activity is relatively high (Oakley *et al.*, 1996). Omission of treatments or reduced rates may also help preserve polyphagous predator activity, which may lead to improved aphid population suppression (Holland & Thomas, 1997).

6.2 *Winter and spring beans*

Experiments were done on both winter (5) and spring beans (12). In the bean crop the main IFS treatment has been bettered by alternatives in 11% of cases (Fig 5).

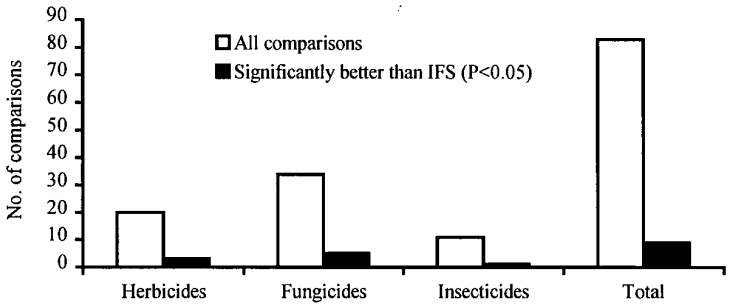

Fig. 5. Total number of validation treatments for winter and spring beans, 1993-1997, and the number of treatment with a significant yield increase compared to IFS.

The majority of these improvements were due to the application of fungicides to winter beans at Boxworth (Table 15a). At this site, in all years, no fungicides were applied to the IFS as disease was not considered a problem. Where fungicides were applied in the validation experiments, yield increases of up to 0.57 t/ha and increases in gross margin of up to £45 were seen. No one timing appeared to be consistently better than any other for the control of chocolate spot which was the main disease present. In a conventional situation, control of chocolate spot are generally two or three spray programmes using chlorothalonil, started during early flowering (Dobson & Giltrap, 1991).

In the spring bean crop, at Rosemaund, the use of pre-emergence residual herbicides to control weeds resulted in higher yields and gross margins than where pre-drilling, mechanical weeding or post-emergence herbicides were used (Table 15b). Post-emergence herbicide choice is very limited in the spring bean crop and often weather conditions are not conducive to maximum product activity (Heath *et al.,* 1991; Cook *et al.*, 1993; Cook & Clarke, 1997). In later years pre-emergence herbicides were increasingly used.

A single response to an early application of cypermethrin to control pea and bean weevil was seen at Boxworth, but this was not repeated in other years (Table 15c). The occurrence of specific, isolated incidences of yield responses to individual pests such as this, should not be taken as generally indicative of the importance of particular pests. The damage potential of individual pests will vary between seasons and is a function of pest population size, crop growth stage in relation to timing of attack, and possible crop compensation and/or resistance to attack (Dent, 1991). In some specific instances (e.g. potato cysts nematode (*Globodera* spp) control), it is also possible that control measures may be justified to prevent long-term population build-up rather than tactical prevention of yield loss (Phillips & Trudgill, 1998).

Table 15. Yield increases in winter and spring beans ($p<0.05$), 1993-1997

a) Fungicides

Year	Site	Type	IFS programme	Validation treatment	Yield inc. (t/ha)
1995	BX	Winter	No fungicide	**plus** chlorothalonil (500 g ai/ha) + benomyl (550 g ai/ha) early flower	0.40
1995	BX	Winter	No fungicide	**plus** chlorothalonil (500 g ai/ha) + benomyl (550 g ai/ha) early flower chlorothalonil (500 g ai/ha) + benomyl (550 g ai/ha) end of flower	0.49
1995	BX	Winter	No fungicide	**plus** iprodione (501 g ai/ha) + thiophanate-methyl (501 g ai/ha) late flower	0.57
1997	BX	Winter	No fungicide	**plus** chlorothalonil (500 g ai/ha) + carbendazim (256 g ai/ha) early flower	0.26

b) Herbicides

Year	Site	Type	IFS programme	Validation treatment	Yield inc. (t/ha)
1996	RM	Spring	glyphosate (540 g ai/ha) pre-drilling + Mechanical weeder x2 May & June	**plus** simazine (750 g ai/ha) pre-emergence	0.74
1997	RM	Spring	glyphosate (540 g ai/ha) pre-drilling + bentazone (960 g ai/ha) June	**plus** simazine (1000 g ai/ha) pre-emergence	0.33

c) Insecticides

Year	Site	Type	IFS programme	Validation treatment	Yield inc. (t/ha)
1994	BX	Winter	No insecticide	**plus** cypermethrin (25 g ai/ha) 4-6 nodes	0.40

6.3 *Potatoes*

In potatoes, 48 comparisons were made in nine site years (Fig. 4), there were only two significant ($p<0.05$) yield responses to the validation treatments, both due to mechanical weeding.

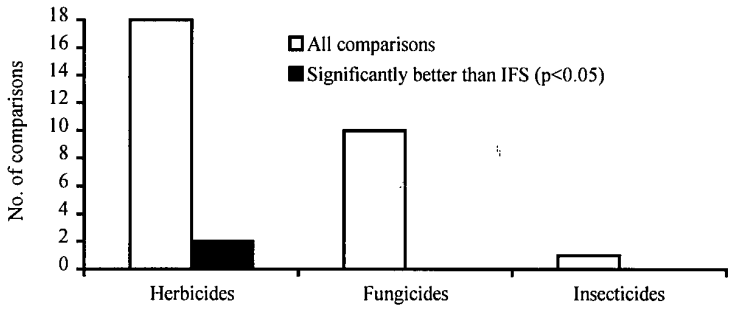

Fig. 4. Total number of validation treatments for potatoes, 1993-1997, and the number of treatment with a significant yield increase compared to IFS.

Generally, mechanical weeding was very successful in the integrated system at Rosemaund and High Mowthorpe. At Rosemaund, a decision not to use the weeder was made in 1995 because the bed widths were uneven and damage occurred to the ridge structure, soil moisture content was also too high. In 1997, early closure of the crop canopy, rain and soil conditions prevented its use. At both these dates significant reductions in yield were seen where the weeder was used in the validation trials (Table 14).

Table 14. The effect of mechanical weeding on yield, Rosemaund 1995 &1997, cv Estima

Treatment	IFS	+ Weeder
1995		
Yield (t/ha)	41.40	**30.04**
1997		
Yield (t/ha)	62.83	**55.74**

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level.

At High Mowthorpe, the weeder was used successfully in three years out of five. Problems were encountered when wet soil conditions were encountered at the first flush of weeds, weed control was reduced but yields were unaffected.

Reductions/alterations in the potato fungicide programs were made but none showed any yield differences to that of the IFS system. In the Integrated system an electronic blight monitor was used to monitor high risk periods and at Rosemaund, for a ware crop, it was possible to widen spray intervals from 10 to 14 days during periods of predicted lower blight pressure. In contrast, at High Mowthorpe, in a high value seed crop, where blight risk during the period of study was higher than that traditionally seen, sprays were maintained at maximum intervals. Opportunities exist to reduce pesticide inputs to the potato crop but care and skilled advice are crucial to the success of this high value crop.

6.4 *Linseed*

Linseed was present in the trial at ADAS Boxworth only, spring linseed was grown from 1993-1995 and winter sown in 1996 and 1997, a total of 6 site years. All decisions made on the spring linseed were optimised and only 7% of decisions made on the winter linseed resulted in significantly higher yields than the IFS, but these lead to mean decreases in gross margin of £3, a result of high fungicide prices in relation to output from the crop. The treatments that resulted in yield increases in the winter linseed were applications of fungicides (Table 13). As the area of winter linseed has increased, so has the level of disease. The winter linseed crop was only introduced commercially in 1996. The number of chemicals available for use on the crop was limited as was information on disease control.

Table 13. Yield increases in winter linseed at Boxworth ($p<0.05$), 1993-1997

Year	Variety	IFS programme	Validation treatment	Yield inc. (t/ha)	GM change* (£/ha)
1996	Oliver	No fungicide	iprodione (501 g ai/ha) + thiophanate-methyl (501 g ai/ha) June	0.14	0
1997	Oliver	No fungicide	tebuconazole (250 g ai/ha) May tebuconazole (250 g ai/ha) June	0.37	-20
1997	Oliver	No fungicide	iprodione (251 g ai/ha) + thiophanate-methyl (251 g ai/ha) May iprodione (251 g ai/ha) + thiophanate-methyl (251 g ai/ha) June	0.41	12

*NB: Figures in bold are significantly different from the Integrated treatment at the 5% level.

6.5 *Spring oilseed rape*

Validation experiments on spring oilseed rape were limited to Pathhead (5 site years) where the crop was grown. The only treatment to be significantly better than the IFS was an extra 30 kg/ha nitrogen in 1997, but this effect was only seen one year in five.

7. GENERAL DISCUSSION

In the main integrated farming project, the priority integrated practices were identified as follows:

i) Targeted pesticides used at appropriate rates, based on crop monitoring
ii) Nutrient inputs matched to crop requirements, soil reserves and offtakes
iii) Resistant varieties to minimise the need for fungicide inputs
iv) Planned, rotational approach to weed control, combining mechanical weed control, stale seedbed techniques and delayed drilling coupled with appropriate herbicide use.

v) Crop diversity in a rotation to minimise disease, pest and weed problems, to manage nutrient resources, and to provide diverse habitat and food sources for beneficial species.
vi) Flexible cultivation policy designed to meet crop needs, retain soil structure, minimise erosion, encourage invertebrates, control weeds and minimise energy use
vii) Field margins managed to encourage biodiversity, beneficial predators and parasites of crop pests

The most commonly used practices to achieve these aims were the use of resistant varieties, delayed drilling, mechanical weed control, close crop monitoring and the use of spray/no spray thresholds. Overall, large reductions in pesticide and nitrogen use have been made in the IFS system (Table 18)

Table 16. Reductions in pesticide use and nitrogen in the LINK-Integrated Farming Systems Project

	% reduction
Herbicides	19
Fungicides	52
Insecticides	63
Nitrogen	19
Plant growth regulators	43

In the main IFS report production margins have been used as the main measure of profitability (Gross output - (Variable + Operational costs)), but in this report modified gross margins are used (Gross output - (Variable + Application costs)). Over the entire project (6 sites), an average of £51/ha reduced gross output resulted from the integrated system, but variable costs were £24/ha lower and operational costs £10/ha lower. This gave a production reduction of only £17/ha. There was no significant ($p<0.05$) difference in the production margin of both systems. There was considerable variation in gross margins between sites (Table 17). Gross margins varied between years but mainly followed the same pattern as the site means.

Table 17. Mean gross margin for all sites - over all crops (£/ha/year)

Site name	Conventional	Integrated	Difference (IFS-Conv)
ADAS Rosemaund	1790	1689	-101
ADAS Boxworth	854	809	-45
ADAS High Mowthorpe	1202	1053	-149
Pathhead	764	768	4

From the 7.0% of cases in the validation trial where the IFS treatment had been bettered by alternatives, could the profitability be made to match or better that of the conventional? The results from this experiment indicate where statistically significant improvements to yield

were achieved, these were not always associated with improvements in gross margin. Table 18 shows the mean potential yield and gross margin changes.

Table 18. Mean yield and gross margin changes from the validation treatments.

Crop	Factor	Potential improvements in yield (t/ha)	Potential improvements in Gross margin (£/ha)
Wheat	herbicide	0.85	85
	nitrogen	0.67	45
	fungicide	0.49	31
Spring barley	nitrogen	0.50	52
	nitrogen and plant growth regulator	0.61	54
Winter linseed	Fungicides	0.31	-3
Winter beans	Fungicide	0.43	20
Spring beans	Herbicides	0.54	67
	Insecticides	0.40	32

At an individual crop level it is easier to see the effects of the integrated system on profitability and how the results of the validation experiment can help improve profitability.

In the wheats, differences between the two systems (Table 19) were mainly related to yield, but at Boxworth feed wheats were grown in the conventional system and milling varieties in the IFS. Here the premiums often compensated for the lower yields in the IFS system indicating the importance of foliar nitrogen application for grain quality. Improvements to the nitrogen, herbicide and fungicides could account for an improvement of gross margin of between £31 and £52 (Table 18). At High Mowthorpe the same variety of milling wheat (cv Hereward) was grown in both systems, therefore the LINK-IFS system was unable to rely on host resistance to reduce pesticide use or a high premium to offset the lower yields, this resulted in an overall loss of £138 /ha (Table 19).

Spring barley was grown in the IFS system at Pathhead and was more profitable than the higher yielding winter barley of the conventional system. Malting premiums were always obtained in the spring barley. The difference in gross margin between the two systems (£104) (Table 19) could have been greater as an additional 30 kg/ha nitrogen and a growth regulator increased yield by up to 0.9 t/ha and gross margins by £129.
Potatoes were grown for seed at High Mowthorpe and for ware at Rosemaund and the gross margins reflected the differences in yield (Table 19). At both sites few risks were taken through lowering inputs, the high value of this crop means that a slight alteration in yield can lead to large decreases in gross margin and the amounts saved in variable costs are only a small percentage of this.

Winter beans had a lower gross margin under the integrated system (Table 19) and this could have been improved by the application of appropriate fungicide inputs for chocolate spot control (Table 18). Considerable improvements could have been made to the profitability of spring beans, which failed in the first few years of the study, due to weed control and

establishment problems. But linseed was probably grown at optimum profitability in the integrated system.

Table 19. Mean gross margin for all sites - over all crops (£/ha/year)

Site name	Conventional	Integrated	Difference (INT-conv)
1st wheat			
ADAS Rosemaund	1033	1115	82
ADAS Boxworth	976	961	15
ADAS High Mowthorpe	1011	873	-138
Pathhead	929	944	15
Winter and Spring Barley			
Pathhead	786	890	104
Potatoes			
ADAS Rosemaund	5796	5162	-634
ADAS High Mowthorpe	2867	2815	-52
Winter beans			
ADAS Boxworth	747	660	-87
Spring beans			
ADAS Rosemaund	-	899	-
ADAS High Mowthorpe	-	747	-
Linseed			
ADAS Boxworth	-	580	-

The results indicate scope for improving the gross margins of the IFS system up to the level of the conventional system, through optimising weed control, better prediction of nitrogen requirements and maximising production from breakcrops. Generally improved decision making is needed to refine Integrated Farming Systems and minimise inputs by allowing better targeting, and better prediction of problem situations, allowing growers to balance risks with the benefit of the best information available.

The information from the validation study has quantified the effects of some of the risks taken within the LINK Integrated Farming Systems project. A technique such as the validation study should be used extensively within any field scale experiments with limited replication. The statistical design has been shown to be an important part of this type of experiment and the field experimenter and statistician should work closely to optimise benefits from the research.

8. CONCLUSIONS

1. This study demonstrated that the treatment adopted in the LINK-IFS project had been bettered by alternatives selected for test in the validation studies in only 7.0% of cases.

Showing that decisions were optimised in the LINK-IFS project in the vast majority of cases.

2. The statistical evolution of the validation experiments over time allowed the accurate estimation of differences between any two of the treatments. The information on design from this experiment should be used in the wide arable experimentation context.

3. The use of the validation experiment has allowed testing of alternative or 'conventional' treatments. This information can then be used in future years to refine decisions made in the developing IFS system. The inclusion of these trials has provided a valuable management tool in determining the factors limiting further reductions in inputs, and optimising profitable output.

4. Variety choice has a key impact on the profitability of the farming system when reducing inputs. There is evidence that the better farmers in the UK are now attempting to match the fungicide requirement of varieties to the 'responsiveness' of varieties although it is clear that the smaller farmers are not yet adopting this strategy.

5. The decision limit the use of autumn applied residual herbicides was shown to be incorrect. The difficulty of optimising the spring weed control strategy is an important area of future concern. This work clearly shows that it is important to know how many weeds and of which species in the overwinter period may cause yield loss, and have the ability to robustly remove them in the spring, if autumn residual herbicide use is to be decreased.

6. The most cost effective fungicide spray in winter wheat was at GS 37-39. The value of earlier sprays (at GS31/32) and later 'ear' sprays cannot easily be quantified without the luxury of hindsight. Such decisions have to be made using an assessment of likely risk and growers would benefit from decision support systems for these fungicide timings.

7. Insecticides use in all crops (except seed potatoes) was limited and optimised in most cases.

8. Generally nitrogen rates calculated from Fertiliser planning systems such as Fertiplan, and modified by results of soil nitrogen analysis, were optimal for winter wheat but when sub-optimal, yield losses could be severe and profitability was severely decreased. The system used was not suitable for the Scottish site at Pathhead where nitrogen rates calculated from soil nitrogen analyses were consistently 30 kg/ha too low on spring barley at Pathhead. The nitrogen fertiliser prediction system used needs refining for use on Scottish sites. Analysis of soil mineral nitrogen content is expensive and savings in nitrogen use may not cover the cost of sampling, though in some cases very significant reductions in nitrogen use could be made. Better systems are required to try and identify situations where nitrogen inputs can be better tailored to crop demand. The current research into canopy management may provide a suitable alternative method to optimise nitrogen use in crops.

9. Mechanical weeding in potatoes was a successful and economically viable technique when soil conditions were dry at the time of the first weed flush. It was most successful when used in conjunction with low-dose post-emergence herbicides.

10. Information on disease control strategies in winter beans is limited and more research is required to optimise fungicide inputs and evaluate effects of disease control, which may not always be economically viable in such crops.

11. Weed control in spring legumes should be based on use of pre-emergence residual herbicides where soil conditions are suitable, selecting suitable products on their efficacy and environmental profile.

12. The results indicate scope for improving the gross margins of the IFS system up to the level of the conventional system, through optimising weed control, better prediction of nitrogen requirements and maximising production from breakcrops

13. Using an integrated farming system can be more risky for growers until confidence and experience are built up in the developed system. By it's nature, an IFS system is knowledge intensive, and greater technical support is required. Decision support systems which can give growers more information about the likely risk of decisions would help to give growers confidence about their decision making and allow them to more readily adopt integrated systems. Thresholds used in such systems must be well established and robust if growers are to have the confidence to move to more integrated systems. As well as sophisticated decision support systems, growers also need access to simple biological information about pests and diseases to allow identification and determination of pest and disease levels.

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11. PRINCIPAL WORKERS

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PART II

Table 1. 1993 ADAS Rosemaund, Field: Barnfield, Winter Wheat, yield

Treatment	Yield t/ha
1. As IFS, Appendix 1	8.67
2. 30 kg N/ha as NH4NO3 (6.5.93)	8.89
3. Tilt 0.375 l/ha + Corbel 0.5 l/ha (6.5.93)	8.92
4. Adjuvant Management Strategy	8.37
Corbel 0.5 l/ha + LI700 (6.5.93)	
Pointer 0.25 l/ha + LI700 0.5% (2.6.93)	
Folicur 0.25 l/ha + Bond 0.14% (18.6.93)	
30 kg N/ha as foliar urea (2.7.93)	
5. 2.5 l/ha Geomar C plus at GS 31/32, GS 57&63	8.84
10.8 kg/ha N at GS 73 as foliar urea (2.7.93)	
6. 250 kg/ha BFS A broadcast at GS 31/32	9.21
2.5 l/ha Goemar C plus at GS 31/32, GS 57&63	
10.8 kg/ha N at GS 73 as foliar urea (2.7.93)	
7. Folicur 1 l/ha at GS 57 (2.6.93)	8.75
8. Bolda 5 l/ha + Radar 0.3 l/ha GS 67/69 (18.6.93)	8.71
9. Stohler foliar urea, 10.8 kg/ha N at GS 75 (5.7.93)	8.69
10. Decis 250 ml/ha GS 80 (8.7.93)	8.89
11. Folicur 0.5 l/ha + Goemar Gold 2.5 l/ha GS 57 (4.6.93)	8.67
SED	0.242
CV%	3.9

BFS - Bio Farm Services
Stohler - Stohler Agrochemicals Ltd

Table 2. 1993 ADAS Rosemaund, Field: Cottage, winter wheat, yield

Treatment	Yield t/ha
1. As IFS appendix 2	8.47
2. 30 kg N/ha as NH4NO3 (6.5.93)	8.59
3. Tilt 0.375 l/ha Gs 31/32 (6.5.93)	8.56
4. Adjuvant Management Strategy	8.15
Corbel 0.5 l/ha + LI700 Gs 31/32 (6.5.93)	
Pointer 0.25 l/ha + LI700 0.5% GS 45 (2.6.93)	
Folicur 0.25 l/ha + Bond 0.14% GS 65 (18.6.93)	
30 kg N/ha as foliar urea GS 73 (2.7.93)	
5. Terpal 1 l/ha + Citowett GS 45 (25.5.93)	8.33
6. 2.5 l/ha Goemar C plus at GS 31/32, GS 57, 63/65	8.31
10.8 kg/ha N at GS 73 as Stohler foliar urea	
7. 250 kg/ha BFS A broadcast at GS 31/32	8.66
2.5 l/ha Goemar C plus at GS 31/32, GS 57&63/65	
10.8 kg N at GS 73 as Stohler foliar urea	
8. Folicur 1 l/ha at GS 57 (2.6.93)	8.66
9. Bolda 5 l/ha + Radar 0.3 l/ha GS 63/65 (18.6.93)	8.61
10. Stohler foliar urea, 10.8 kg/ha N at GS 73 (2.7.93)	8.27
11. Decis 250 ml/ha GS 80 (8.7.93)	8.67
12 Folicur 0.5 l/ha + Goemar Gold 2.5 l/ha GS 57(4.6.93)	8.01
SED	0.140
CV%	2.3

Table 3. 1993 ADAS Rosemaund, Field: Bullocks Pasture, Spring beans, yield

Treatment	Yield t/ha
1. As IFS, appendix 3	6.35
2. 25kg/ha Basic micromate (13.5.93) 2.5l/ha Goemar Gold (2.6.93) 2.5l/ha Goemar Gold (17.6.93)	6.07
3. 100kg/ha BFS C (13.5.93) 2.5l/ha Goemar Gold (2.6.93) 2.5l/ha Goemar Gold (17.6.93)	6.68
4. Folio 2l/ha (24.6.93)	5.94
5. Bravo 3.0l/ha (30.6.93)	6.38
6. Untreated	5.86
SED	0.206
CV%	4.7

Table 4. 1993 ADAS Rosemaund. Field name: Block 1, spring beans, yield

Treatment	Yield t/ha
1. As IFS, appendix 4	5.73
2. 25kg/ha Basic micromate (13.5.93) 2.5l/ha + Goemar Gold (2.6.93) + 2.5l/ha Goemar Gold (17.6.93)	6.27
3. 100kg/ha BFS C (13.5.93) + 2.5l/ha Goemar Gold (2.6.93) + 2.5l/ha Goemar Gold 17.6.93	6.47
4. Folio 2l/ha (24.6.93)	5.65
5. Bravo 3.0l/ha (30.6.93)	5.66
6. Untreated	5.22
S.E.D.	0.281
CV%	6.8

Table 5. 1993 ADAS Rosemaund, Field: Northfield, Potato, yield

	Yield t/ha <40mm	40-60mm	60-85mm	>85mm	Total
1. IFS as appendix 5	2.00	25.90	30.69	0.32	58.93
2. plus 100 kg/ha micromate (12.5.93) 2.5l/ha Goemar MB86 (17.6.93)	2.14	24.71	33.31	1.72	61.88
3. plus 300 kg/ha Mix B (12.5.93) 2.5l/ha Goemar MB86 (17.6.93)	1.93	23.20	33.11	1.69	59.93
4.plus 1.7kg/ha Dithane (7 day intervals) 11 sprays from (17.6.93) to (26.8.93)	1.98	26.03	37.36	1.04	66.41
5.plus 1.7kg/ha Dithane (14 day intervals) 6 sprays from (17.6.93) to (26.8.93)	2.17	28.39	30.69	0.42	61.68
6. plus 5l/ha Redicrop (6.7.93)	2.59	27.16	28.52	0.26	58.54
7. plus 5l/ha Fazor (4.8.93)	1.98	25.68	27.88	0.65	56.17
8. plus 1.5kg/ha Guardian (14 day intervals) 6 sprays from (17.6.93) to (26.8.93)	2.59	29.17	29.37	0.52	61.65
9. plus 10l/ha Fosfol C (24.6.93)	2.04	27.94	32.70	0.36	63.04
SED	0.280	2.163	3.563	0.599	3.961
CV%	18.3	11.6	16.0	109.3	9.2

Table 6. 1994 ADAS Rosemaund, Field name: Barnfield, Yield adjusted for vigour score as covariate

Treatment	Total yield (t/ha)	Yield 60-85mm (t/ha)	Yield 45-60mm (t/ha)	Yield 25-45mm (t/ha)
1. As IFS, as Appendix 6	29.3	10.85	12.87	5.67
2. Sencorex + PDQ	35.6	14.85	14.72	6.07
3. Conventional blight programme	22.8	6.73	10.70	5.54
4. Dithane @ 14 day intervals	29.4	9.02	14.68	5.67
5. Not mechanically de-haulmed, 4.0l/ha Reglone	29.1	9.91	14.65	4.54
F.pr	0.109	0.132	0.355	0.140
LSD	9.35	6.33	5.09	1.21
SED(11 df)	4.25	2.88	2.31	0.552
% CV	19.8	38.2	23.3	13.7

Table 7. 1994 ADAS Rosemaund, Field name: Barnfield, Tuber skin disease assessment going into store.

Treatment	Common Scab Incidence	Common Scab Severity	Silver Scurf Incidence	Silver Scurf Severity	Black Scurf Incidence	Black Scurf Severity
IFS, App. 6	58.0	1.1	55.0	2.8	12.0	0.1
2	42.0	2.0	39.0	1.3	12.0	0.2
3	27.0	0.3	49.0	2.2	19.0	0.4
4	51.0	1.2	57.0	1.6	16.0	0.4
5	22.0	0.2	48.0	1.9	24.0	0.3
F.pr	0.22	0.29	0.81	0.81	0.87	0.86
SED	16.85	0.89	15.92	1.29	12.96	0.28
LSD	36.72	1.95	34.69	2.82	28.24	0.60
%CV	59.6	134.7	45.4	94.4	110.4	154.5

Table 8. 1994 ADAS Rosemaund, Field name: Barnfield, Tuber skin disease assessment coming out of store.

Treatment	Common Scab Incidence	Common Scab Severity	Silver Scurf Incidence	Silver Scurf Severity	Black Scurf Incidence	Black Scurf Severity
IFS, App. 6	27.0	0.5	70.0	3.3	10.0	0.1
2	43.0	0.6	50.0	1.5	18.0	0.3
3	10.0	0.1	55.0	4.5	12.0	1.2
4	23.0	0.3	43.0	1.8	15.0	0.2
5	26.0	0.5	40.0	0.8	28.0	0.4
F.pr	0.03	0.19	0.09	0.03	0.59	0.58
SED	8.22	0.19	10.46	1.09	11.64	0.74
LSD	17.91	0.41	22.79	2.38	25.36	1.62
%CV	45.0	64.2	28.7	65.6	99.2	242.0

Table 9. 1994 ADAS Rosemaund, Field name: Bullocks Pasture - Winter Wheat, Grain Yield, Economics & Grain Quality

	Treatment	Yield T/ha	GM* £/ha	SPWT Kg/hl	TGW g	Protein %	HFN	SDS
1	AS IFS, Appendix 7	9.19	724	80.5	44.4	9.9	347	83.8
2	-Duplosan	9.21	735	81.0	43.3	9.9	347	85.8
3	- Meteor	9.33	746	81.7	45.6	10.0	342	85.8
4	+0.375l/ha Tilt @GS33	9.67	753	80.6	44.7	9.9	343	83.0
5	-GS39 fungicide	9.05	733	80.8	41.8	9.8	349	83.3
6	+2.0l/ha Sambarin @GS39, - Tilt	9.56	753	79.7	44.3	9.7	336	83.3
7	+1.0l/ha Terpal @GS30	9.33	718	81.0	43.4	9.8	340	84.0
8	+1.0l/ha Folicur @GS39, - Tilt	9.53	750	81.1	44.3	9.9	344	84.8
9	+30kgN/ha as NH4NO3 @ GS39, - f.urea	9.68	774	81.0	44.1	10.0	338	84.0
10	+0.3l/ha Tilt & 0.3kg/ha Benlate @GS 69	9.58	744	81.4	45.9	9.9	333	82.8
11	+250mg/ha Decis @GS 73	9.58	752	81.0	43.0	9.7	342	83.5
12	-f.urea	9.30	750	80.1	42.5	9.2	330	77.5
	F.pr	0.09		0.29	0.07	<0.001	0.25	0.002
	SED	0.217		0.69	1.21	0.11	6.9	1.58
	LSD	0.439		1.39	2.45	0.22	14.0	3.20
	%CV	3.3		1.2	3.9	1.5	2.9	2.7

* over variable & application costs. £120/t for 11% protein and above, £1/t drop in price for every 0.1% protein below 11%. 10% protein and below, no premium £101/t.

Table 10. 1994 ADAS Rosemaund, Field name: Block 1 - Winter Wheat, Grain Yield, Economics & Grain Quality

	Treatment	Yield t/ha	GM* £/ha	SPWT kg/hl	TGW g	Protein %	HFN	SDS
1	AS IFS, Appendix 8	9.58	861	81.84	44.1	10.15	346	88.5
2	-Duplosan	9.44	855	81.65	44.1	10.19	354	88.0
3	- Meteor	9.35	862	82.10	44.0	10.37	353	89.3
4	+0.375l/ha Tilt @GS33/37	9.28	808	80.30	43.8	10.22	355	86.8
5	-GS39 fungicide	9.07	837	81.72	42.9	10.28	354	90.0
6	+2.0l/ha Sambarin @GS39, - Tilt	9.60	865	81.72	44.5	10.27	357	88.3
7	+1.0l/ha Terpal @GS30	9.35	816	81.80	43.5	10.16	347	87.5
8	+1.0l/ha Folicur @GS39, - Tilt	9.85	874	81.80	44.7	10.11	339	86.3
9	+30kgN/ha as NH4NO3 @ GS39, - f.urea	9.67	880	81.72	43.0	10.34	361	88.3
10	+0.3l/ha Tilt & 0.3kg/ha Benlate @GS 69	9.64	848	82.08	44.5	10.15	345	88.8
11	+250mg/ha Decis @GS 73	9.46	827	81.78	45.4	10.08	355	85.0
12	-f.urea	9.38	751	81.28	43.0	9.91	343	83.5
	F.pr	0.009		0.265	0.072	0.167	0.472	0.167
	SED (max-min)	0.1547		0.508	0.673	0.1246	8.43	1.862
	LSD[37df]	0.3140		1.031	1.366	0.2529	17.11	3.779
	%CV	2.7		1.0	2.5	2.0	3.9	3.5

* over variable & application costs. £120/t for 11% protein and above, £1/t drop in price for every 0.1% protein below 11%. 10% protein and below, no premium £101/t.

Table 11. 1994 ADAS Rosemaund, Field name: Northfield - Winter Wheat, Grain Yield, Economics & Grain Quality

	Treatment	Yield t/ha	GM* £/ha	SPWT kg/hl	TGW g	Protein %	HFN	SDS
1	AS IFS, Appendix 9	8.72	796	80.58	44.1	10.07	340	79.1
2	- Meteor	8.64	819	81.48	45.1	10.27	329	83.8
3	+ 20kgN/ha as NH4NO3 @GS23/30	9.25	867	80.65	42.9	10.33	336	80.3
4	+20g/ha Ally &0.75l/ha Starane 2 @GS33	9.28	859	81.53	45.0	10.20	326	81.0
5	+0.375l/ha Tilt @GS33	9.41	872	81.13	41.1	10.28	337	81.5
6	-GS39 fungicide	8.93	753	80.80	42.0	9.93	334	77.8
7	+2.0l/ha Sambarin @GS39, - Tilt	8.32	744	80.85	43.3	10.12	344	79.8
8	+1.0l/ha Terpal @GS30	9.23	741	81.00	43.9	9.94	338	77.3
9	+1.0l/ha Folicur @GS39, - Tilt	9.16	855	81.03	43.6	10.29	326	81.5
10	+30kgN/ha as NH4NO3 @ GS39, - f.urea	9.28	766	80.53	43.6	10.04	333	79.3
11	-Ally&Starane @GS57	8.84	746	80.75	43.0	9.94	329	78.8
12	+0.3l/ha Tilt & 0.3kg/ha Benlate @GS 69	8.81	786	81.13	44.7	10.05	327	76.8
13	+250mg/ha Decis @GS 73	8.76	702	81.18	44.2	9.89	335	79.3
14	-f.urea	8.10	661	80.15	43.9	9.36	345	72.3
	F.pr	0.656		0.300	0.082	<0.001	0.368	<0.001
	SED(max-min)	0.536		0.4279	1.02	0.1506	7.52	1.592
	LSD	1.088		0.8585	2.071	0.3058	15.26	3.232
	%CV	9.8		0.9	3.8	2.4	3.7	3.3

* over variable & application costs. £120/t for 11% protein and above, £1/t drop in price for every 0.1% protein below 11%. 10% protein and below, no premium £101/t.

Table 12. 1994 ADAS Rosemaund, Field name: Holly-Grove - Spring Beans cv. Victor, yield and quality

	Treatment	Yield (t/ha) combine	Yield (t/ha) - admixture	Specific Weight (kg/hl)	TGW (g)
1	AS IFS, Appendix 10	0.33	0.31	76.7	433.3
2	Pre-emergence Senate @ 4l/ha	0.23	0.21	76.9	468.9
3	Power harrow after planting	0.54	0.51	75.5	451.7
4	Decis @ 300ml/ha for weevil - 2-3 leaflets	0.32	0.29	76.8	451.9
5	Benlate 0.5kg/ha + Bravo 2l/ha - early flower	0.24	0.21	76.1	464.1
	F.pr	0.006	0.002	0.30	0.55
	SED	0.071	0.062	0.68	21.85
	LSD	0.155	0.136	1.47	47.61
	% CV	30.3	28.8	1.3	6.8

Table 13. 1995 ADAS Rosemaund, Field name: Barnfield - winter wheat, Grain Yield, Economics & Grain Quality

	Treatment	Yield t/ha	GM* £/ha	SPWT kg/hl	TGW g	Protein %	HFN	SDS
1	AS IFS, Appendix 11	5.39	467	81.4	37.8	13.8	361	70.5
2	cv. Brigadier	5.86	495	77.2	39.7	12.2	306	53.3
3	+ Panther 1.0l/ha autumn	6.64	597	82.4	38.8	14.7	354	76.3
4	- Ally + Starane	4.87	424	81.2	37.0	13.5	351	69.8
5	- Chlormequat	5.40	470	82.6	40.1	14.2	354	77.3
6	Ally 15g/ha + Starane 0.75l/ha	5.30	444	81.3	36.7	14.2	355	72.3
7	+ 40 kg N/ha as prills at GS 33, - foliar urea	5.71	500	82.1	38.4	14.8	365	76.8
8	+ Tilt 0.375l/ha @ GS 33	5.64	479	82.0	38.5	13.8	363	73.8
9	+ Terpal 1.0l/ha @ GS 39	5.74	495	82.0	37.3	14.2	358	72.3
10	- foliar urea	5.79	530	82.7	39.2	12.7	361	70.0
11	- GS 39 fungicide	5.46	494	82.3	38.7	13.8	349	73.5
12	Conv.GS 39 fungicide, Opus 0.7l/ha + Patrol 0.3l/ha	5.28	439	81.9	38.0	13.9	363	70.8
13	+ ear insecticide, pirimicarb 280g/ha	5.54	466	82.1	38.9	14.0	349	73.0
14	+ Ear fungicide, Tilt 0.25l/ha	5.44	458	81.8	38.0	14.1	360	73.5
	F.pr	0.014	0.041	<0.001	NS	<0.001	<0.001	<0.001
	SED	0.315	37.23	0.65	1.16	0.253	8.5	1.86
	LSD (df = 43)	0.637	75.24	1.31	2.34	0.511	17.2	3.76
	CV %	9.3	12.6	1.3	4.9	3.0	3.9	4.2

* over variable & application costs

Table 14. 1995 ADAS Rosemaund, Field name: Barnfield - winter wheat, Green Leaf Areas, GS 69, 16 June 1995

	Treatment	Leaf 1	Leaf 2	Leaf 3	Leaf 4
1	AS IFS, Appendix 11	96.3	89.1	74.7	30.4
2	cv. Brigadier	99.4	99.0	97.1	69.8
7	+ 40kg N/ha as prills at GS 33, - foliar urea	98.6	95.9	82.9	54.7
8	+ Tilt 0.375l/ha @ GS 33	98.1	96.3	88.5	40.6
11	- GS 39 fungicide	97.0	87.5	73.4	30.4
12	Conv.GS 39 fungicide, Opus 0.7l/ha + Patrol 0.3l/ha	98.1	94.1	83.2	46.3
	F.pr	0.043	0.174	0.111	0.076
	SED	0.92	4.70	8.47	13.58
	LSD (df = 15)	1.97	10.02	18.05	28.94
	CV %	1.3	7.1	14.4	42.3

Table 15. 1995 ADAS Rosemaund, Field name: Barnfield - winter wheat, Estimated Weed Population No/m² GS 69 16 June 1995

	Treatment	AMG	Wild oats	Cleavers	Chickweed	Pansy	Vol. OSR	Vol. Potato
1	AS IFS, Appendix 11	47.5	0.4	0.2	0.0	28.8	0.1	0.8
3	+ Panther 1.0l/ha autumn	1.0	0.3	0.2	0.0	0.5	0.0	0.3
4	- Ally + Starane	75.0	0.2	1.8	2.0	75.0	0.4	0.6
6	Ally 15g/ha + Starane 0.75l/ha	67.5	0.4	0.0	0.0	12.5	Trace	0.7
	F.pr	<0.001	0.359	0.033	0.111	<0.001	0.149	0.029
	SED(max-min)	10.32	0.129	0.544	0.866	12.02	0.151	0.138
	LSD(max-min) (df = 9)	23.34	0.292	1.231	1.959	27.19	0.342	0.311
	CV %	30.6	57.3	148.4	244.9	58.2	190.3	31.4

Table 16. 1995 ADAS Rosemaund, Field name: Bullocks Pasture - potatoes, Tuber skin disease assessment going into store, November 1995

	Treatment	Common Scab % Incidence	Common Scab % Severity	Silver Scurf % Incidence	Silver Scurf % Severity	Black Scurf % Incidence	Black Scurf % Severity
1	AS IFS, Appendix 12	89.2	1.6	29.0	1.1	6.2	0.1
2	Sencorex & PDQ earlier	94.0	2.0	28.0	1.8	5.0	0.1
3	Mechanical weeder	97.0	2.8	18.0	0.9	7.0	0.4
4	Conv. blight programme	95.0	2.3	31.5	1.3	5.0	0.1
5	Basagran sequence	96.5	1.8	26.0	1.0	5.0	0.2
7	Dithane @ 14 day interval	88.5	1.6	25.5	1.2	19.0	0.4
8	Reglone de-haulming	92.5	2.2	24.5	0.7	10.0	0.4
	F.pr	NS	NS	NS	NS	NS	NS
	SED(max-min)	6.00	0.61	8.27	0.52	5.71	0.14
	LSD (df =22)	12.44	1.26	17.15	1.07	11.84	0.30
	CV %	10.6	49.7	51.1	74.1	117.5	113.1

Table 17. 1995 ADAS Rosemaund, Field name: Bullocks Pasture - potatoes, Tuber skin disease assessment coming out of store, January 1996

	Treatment	Common Scab Incidence	Common Scab Severity	Silver Scurf Incidence	Silver Scurf Severity	Black Scurf Incidence	Black Scurf Severity
	AS IFS, Appendix 12	81.0	2.0	46.7	2.3	6.0	0.1
2	Sencorex & PDQ earlier	88.5	2.3	44.5	2.4	8.0	0.1
3	Mechanical weeder	98.5	3.5	30.5	1.0	7.0	0.4
4	Conv. blight programme	91.0	2.7	48.0	3.2	3.0	Trace
5	Basagran sequence	84.5	2.3	35.5	2.0	6.0	0.2
7	Dithane @ 14 day interval	87.5	2.0	43.0	2.6	12.5	0.2
8	Reglone de-haulming	83.0	2.4	46.5	1.8	14.5	0.7
	F.pr	NS	NS	NS	NS	NS	NS
	SED	7.89	0.717	7.53	0.689	6.22	0.258
	LSD (df = 22)	16.36	1.487	15.62	1.429	12.90	0.534
	CV %	14.8	49.1	28.8	50.7	129.0	177.8

Table 18. 1995 ADAS Rosemaund, Field name: Bullocks Pasture - potatoes, yield and quality

	Treatment	Total Yield t/ha	Yield >60mm t/ha	Yield 45-60mm t/ha	Yield 0-45mm t/ha
1	AS IFS, Appendix 12	41.40	18.98	17.72	4.70
2	Sencorex & PDQ earlier	39.54	17.81	16.88	4.85
3	Mechanical weeder	30.04	10.11	15.24	4.68
4	Conv. blight programme	38.89	16.23	17.94	4.71
5	Basagran sequence	39.68	17.29	17.02	5.36
7	Dithane @ 14 day interval	41.63	18.80	17.77	5.05
8	Reglone de-haulming	40.12	17.33	17.67	5.12
	F.pr	0.033	NS	NS	NS
	SED	2.975	3.300	1.012	0.513
	LSD (df = 21)	6.170	6.844	2.099	1.064
	CV %	12.4	31.8	9.6	17.1

* Gross Margin figures are based on actual prices received and at the time of writing, the baking grade had not been sold out of cold store.

Table 19. 1995 ADAS Rosemaund, Field name: Cottage, spring beans, Seed Yield, Economics & Seed Quality

	Treatment	Yield t/ha	GM* £/ha	SPWT kg/hl	TGW g
1	AS IFS, Appendix 13	3.36	301	78.3	458.3
2	+ Basagran 3.0l/ha	3.24	230	77.9	450.8
3	+ Folio 2 kg/ha	3.50	276	78.7	472.8
4	+ Benlate 1 kg/ha & Bravo 1.0l/ha	3.08	236	78.4	461.6
	F.pr	0.036	<0.001	NS	NS
	SED	0.111	14.47	0.415	14.74
	LSD (df = 33)	0.227	29.55	0.847	30.10
	CV %	6.2	9.5	1.0	6.0

* over variable & application costs

Table 20. 1995 ADAS Rosemaund, Field name: Holly-Grove - winter wheat, Green Leaf Areas, GS 69, 16 June 1995

	Treatment	Leaf 1	Leaf 2	Leaf 3	Leaf 4
1	AS IFS, Appendix 14	98.0	96.6	89.6	59.7
2	cv. Brigadier	99.3	98.5	92.8	67.9
7	+ 40kg N/ha as prills at GS 33, - foliar urea	98.5	96.9	91.0	65.9
8	+ Tilt 0.375l/ha @ GS 33	98.4	97.5	92.7	69.1
11	- GS 39 fungicide	97.9	96.1	90.6	43.0
12	Conv.GS 39 fungicide, Opus 0.7l/ha + Patrol 0.3l/ha	98.0	95.9	93.8	70.2
	F.pr	0.005	0.014	0.569	0.018
	SED	0.312	0.674	2.485	7.37
	LSD (df = 15)	0.665	1.436	5.296	15.71
	CV %	0.4	1.0	3.8	16.6

Table 21. 1995 ADAS Rosemaund, Field name: Holly-Grove - winter wheat, estimated Weed Population No/m² GS 69 6 June 1995

	Treatment	AMG	Ryegrass	Cleavers	Speedwell	Pansy	P.Piert
1.	AS IFS, Appendix 14	10.0	8.8	0.0	0.1	Trace	0.2
3.	+ Panther 1.0l/ha autumn, - mecoprop	1.0	4.3	0.2	0.0	0.0	0.0
4.	- mecoprop in autumn	11.3	8.8	0.6	0.5	0.2	0.2
6.	+ Hoegrass 3.0l/ha	11.8	0.5	0.1	0.3	0.1	0.6
	F.pr	0.001	<0.001	0.002	0.056	0.326	0.390
	SED	1.922	1.215	0.112	0.167	0.102	0.363
	LSD (df = 9)	4.348	2.748	0.248	0.377	0.230	0.821
	CV %	32.0	30.9	70.3	102.0	176.8	221.7

Table 22. 1995 ADAS Rosemaund, Field name: Holly-Grove - winter Wheat, Grain Yield, Economics & Grain Quality

	Treatment	Yield t/ha	GM* £/ha	SPWT kg/hl	TGW g	Protein %	HFN	SDS
1	AS IFS, Appendix 14	6.45	544	82.7	42.9	13.9	358	71.1
2	cv. Brigadier	6.41	509	75.4	41.2	12.9	310	47.5
3	+ Panther 1.0l/ha autumn, - mecoprop	7.11	616	84.9	43.4	13.4	360	71.0
4	- mecoprop in autumn	5.98	500	82.4	41.5	14.2	366	71.0
5	- Chlormequat	6.27	532	83.0	43.2	14.5	362	69.8
6	+ Hoegrass 3.0l/ha	6.59	507	82.8	42.0	13.8	351	69.5
7	+ 40 kg N/ha as prills at GS 33, - foliar urea	6.83	586	82.6	42.7	13.1	355	69.0
8	+ Tilt 0.375l/ha @ GS 33	6.75	562	83.0	42.2	13.9	354	71.8
9	+ Terpal 1.0l/ha @ GS 39	6.20	502	82.2	40.3	13.6	359	69.0
10	- foliar urea	6.50	566	82.3	41.6	12.5	354	67.0
11	- GS 39 fungicide	5.85	491	82.8	39.8	14.3	361	68.5
12	Conv.GS 39 fungicide, Opus 0.7l/ha + Patrol 0.3l/ha	6.55	540	82.7	42.4	13.7	364	70.3
13	+ ear insecticide, pirimicarb 280g/ha	7.00	590	82.7	42.2	13.4	363	69.8
14	+ Ear fungicide, Tilt 0.25l/ha	6.61	549	85.6	43.9	13.8	362	69.5
	F.pr	NS	NS	<0.001	NS	0.005	<0.001	<0.001
	SED	0.331	39.0	0.77	1.07	0.41	7.4	1.67
	LSD (df = 43)	0.669	78.9	1.55	2.16	0.82	15.0	3.37
	CV %	8.3	11.7	1.5	4.1	4.9	3.4	4.0

* over variable & application costs

Table 23. 1996 ADAS Rosemaund, Field name: Cottage, winter wheat - Yield and quality data

Treatment	Yield (t/ha @ 85% DM)	GM (£/ha)	Specific weight (kg/hl)	Thousand Grain Weight (g)
AS IFS, Appendix15	9.50	897	80.91	41.75
2 cv. Brigadier	9.08	693	75.23	40.93
3 Panther 1.5l/ha	9.31	870	80.78	40.69
4 As IFS + Cyperkill 0.2l/ha	9.57	895	81.23	41.42
5 No autumn herbicide	8.52	807	81.20	42.16
6 No PGR	9.31	889	81.50	42.84
7 Terpal 1.0l/ha + Activator	9.54	885	81.15	40.18
8 Nil fungicide	8.23	774	80.20	41.67
9 Opus 0.7l/ha @GS 39	9.39	876	81.15	40.65
10 Opus 0.25l/ha + Patrol 0.3l/ha + MBC 0.3l/ha at GS 65	9.67	893	81.70	40.63
F.prob	<0.001	<0.001	<0.001	0.651
SED	0.171	19.3	0.57	1.09
LSD	0.346	38.9	1.16	2.21
CV%	3.4	4.1	1.3	4.8

Table 24. 1996 ADAS Rosemaund, Field name: Block 1, winter wheat - Yield and grain quality

Treatment	Yield (t/ha @ 85% DM)	GM (£/ha)	Specific weight (kg/hl)	Thousand grain weight (g)
1 AS IFS, Appendix 16	8.75	844	74.59	39.24
2 cv. Brigadier	8.46	665	70.85	39.90
3 No Ally + Starane	8.57	843	74.30	39.05
4 Ally 15g/ha + Starane 0.75l/ha	8.95	855	74.58	38.16
5 No PGR	8.30	802	74.78	39.42
6 Sportak Delta 1.0l/ha @GS33	9.30	875	74.93	40.85
7 Terpal 1.0l/ha (+Activator90)	8.96	850	74.63	39.40
8 Nil fungicide	8.72	859	74.63	37.49
9 Opus 0.7l/ha @GS 39	9.22	887	74.73	39.60
10 plus Opus 0.25l/ha + Patrol 0.3l/ha + MBC 0.3l/ha	8.78	823	74.83	39.10
F.prob	0.002	<0.001	<0.001	0.111
SED	0.181	19.8	0.23	0.75
LSD	0.365	39.9	0.47	1.52
CV%	3.8	4.4	0.6	3.6

Table 25. 1996 Rosemaund, Field name: Northfield - Spring beans, Yield and quality data

Treatment	Yield (t/ha)	GM (£/ha)	Specific weight (kg/hl)	TGW (g)
1 AS IFS, Appendix 17	3.47	376	73.98	547.7
2 Simazine 1.5l/ha	4.16	464	76.83	586.5
3 Basagran 3.0l/ha	3.19	281	74.53	555.5
4 Laser 1.0l/ha	3.77	377	72.70	560.1
5 Benlate 0.5kg + Bravo 500 1.5l/ha	3.30	320	73.43	539.9
F.prob	0.026	0.004	0.094	0.318
SED	0.245	34.2	1.17	19.10
LSD	0.505	70.6	2.42	39.42
CV%	12.4	16.6	2.8	6.2

Table 26. 1996 ADAS Rosemaund, Field name: Holly Grove - Potatoes, Potato yield by size grade (tonnes /hectare)

Treatment	Total all grades	>60mm	45-60mm	<45mm
1. AS IFS, Appendix 18	56.44	40.72	12.99	2.73
2. Arresin 5.6 l/ha + PDQ 2.5 l/ha	55.84	38.55	14.46	2.84
3. Conventional Blight Programme	53.72	36.47	14.25	3.01
4. Shirlan every 10 days from 5 Aug	56.66	40.77	12.92	2.97
5. Reglone desiccant	56.46	40.05	13.67	2.73
F.prob	0.646	0.221	0.542	0.789
SED	1.918	1.871	1.051	0.267
CV%	5.6	7.7	12.7	15.4

Table 27. 1997 ADAS Rosemaund, Field name: Barnfield - Spring Beans, yield and quality

Treatment	Yield (t/ha)		GM* (£/ha)		Specific weight (kg/hl)		Tgw (g)	
	With	With out	With	Without	With	Without	With	Without
Simazine 2.0l/ha	**5.25**	**5.58**	310.00	355.58	77.54	77.09	537.4	529.9
Basagran 2.0l/ha	5.42	5.41	339.12	380.12	77.27	77.36	531.7	535.6
Carbendazim 0.55l/ha/ Bravo 1.0l/ha	**5.51**	**5.32**	333.13	329.22	77.64	76.99	**542.4**	**524.9**
Folio 2.0l/ha	**5.54**	**5.29**	306.15	326.19	77.63	77.00	534.5	532.8

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level

Table 28. 1997 ADAS Rosemaund, Field name: Barnfield - Spring Beans, Weed Assessment 14 July 1997

Treatment	Total Weeds No./m²		Cleavers No./m²	
	With	Without	With	Without
Simazine 2.0l/ha	**2.405**	**7.045**	1.757	2.499
Basagran 2.0l/ha	5.078	4.373	2.234	2.021
Carbendazim 0.55l/ha + Bravo 1.0l/ha	*	*	*	*
Folio 2.0l/ha	5.027	4.423	2.285	1.971

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level

Table 29. 1997 ADAS Rosemaund, Field name: Cottage - Potatoes, yield and quality

	Treatment	Total yield (t/ha)	Yield >65mm	Yield 45-65mm	Yield 0-45mm	GM* £/ha
1	AS IFS, Appendix 20	62.83	40.43	19.53	2.87	5286.88
2	Without Mocap	60.87	**31.03**	26.42	3.42	4714.96
3	Conventional fertilizer rate	64.73	42.24	19.75	2.73	5537.29
4	Conventional herbicide	64.52	40.05	21.12	3.35	5372.75
5	Weeder, no herbicide	**55.74**	**29.97**	22.52	3.25	4090.12
6	Conventional blight programme	57.00	33.59	20.68	2.73	4405.84

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level, gross margin has not been analysed.

* over variable & application costs

Table 30. 1997 ADAS Rosemaund, Field name: Cottage - Potatoes, Foliar blight assessment.

Treatment	No. blight lesions per plot
1. AS IFS, Appendix 20	4.125
6. Conventional fungicide programme	**16.25**

Table 31. 1997 ADAS Rosemaund, field name: Cottage - Potatoes, Weed assessment No./m^2

Treatment	Fat Hen	Chickweed
1. AS IFS, Appendix 20	0.0625	0.1625
4. Conventional herbicide	0.000	0.005
5. Weeder, no herbicide	0.775	1.000

Table 32. 1993 ADAS Rosemaund, Field: Block 1, Spring beans, yield

	Yield (t/ha)
1. AS IFS, Appendix 21	5.73
2. 25kg/ha Basic micromate (13.5.93) + 2.5l/ha Goemar Gold (2.6.93) + 2.5l/ha Goemar Gold (17.6.93)	6.27
3. 100kg/ha BFS C (13.5.93) + 2.5l/ha Goemar Gold (2.6.93) + 2.5l/ha Goemar Gold 17.6.93	6.47
4. Folio 2l/ha (24.6.93)	5.65
5. Bravo 3.0l/ha (30.6.93)	5.66
6. Untreated	5.22
SED	0.281
CV%	6.8

Table 33. 1997 ADAS Rosemaund, Field name: Northfield - Winter Wheat, Grain Yield, Economics & Grain Quality

	Treatment	Yield t/ha	GM* £/ha	SPWT kg/hl	TGW g	Protein %	HFN	SDS
1	AS IFS, Appendix 22	7.00	383.81	73.9	40.6	11.4	218.5	94.9
2	cv. Brigadier	**4.20**	146.28	**62.8**	**33.7**	11.4	**164.1**	**67.6**
3	Javelin Gold 2l/ha	**7.41**	408.82	73.5	40.0	11.4	223.5	94.5
4	No autumn herbicide	7.07	400.83	73.9	40.2	11.4	203.9	94.7
5	No chlormequat	7.12	403.15	74.7	**42.7**	11.5	208.2	95.5
6	No Spring herbicide	7.25	434.61	73.6	38.8	11.4	216.7	95.3
7	Sanction 0.3l/ha @ GS33	7.31	386.60	73.5	40.3	11.5	221.2	94.7
8	Starane 0.75 + Ally 20g	7.04	381.27	74.0	40.9	11.5	208.9	96.1
9	Terpal 1.5l/ha	7.29	385.07	73.7	41.3	11.4	222.9	96.1
10	+ 40kgN/ha as Nitram	7.14	376.69	73.6	40.4	11.5	223.6	93.8
11	No GS 39 fungicide	**6.35**	350.37	**73.6**	**37.9**	11.4	**208.2**	**96.8**
12	Opus 0.75 + Tern 0.3@GS39	**7.58**	414.50	73.7	39.5	11.6	214.1	94.1
13	Folicur 0.4 + MBC 0.3 @GS65	**7.68**	421.14	74.1	40.2	11.4	216.0	96.3
14	Foliar Urea 40kg N/ha	7.19	379.75	73.7	40.1	**11.8**	200.2	97.4

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level, gross margin has not been analysed.

* over variable & application costs

Table 34. 1997 ADAS Rosemaund, Field name: Holly-Grove - winter wheat, Grain Yield, Economics & Grain Quality

	Treatment	Yield t/ha	GM* £/ha	SPWT kg/hl	TGW g	Protein %	HFN	SDS
1	AS IFS, Appendix 23	7.48	448.34	72.4	41.0	11.4	253.0	91.9
2	cv. Brigadier	**6.32**	346.68	**64.3**	**36.9**	**11.0**	238.4	**58.6**
3	Javelin Gold 2l/ha	7.82	467.12	72.7	41.8	11.4	241.1	90.1
4	No autumn herbicide	7.78	484.62	72.8	40.8	**11.2**	241.7	90.4
5	No chlormequat	7.48	457.55	72.0	39.8	**11.6**	243.4	92.2
6	Starane 0.75 + Ally 20g	7.72	451.79	73.2	**43.4**	11.5	236.1	91.7
7	No Spring herbicide	7.39	460.54	71.5	40.6	11.3	238.0	88.8
8	Sanction 0.3l/ha @ GS33	7.69	442.42	72.4	40.4	11.2	249.4	**86.5**
9	Terpal 1.5l/ha	7.55	431.17	73.1	42.1	11.3	248.7	88.9
10	+ 40kgN/ha as Nitram	7.51	431.75	72.9	41.1	**11.6**	260.3	90.0
11	No GS 39 fungicide	**5.75**	324.27	**71.2**	**37.1**	**11.4**	272.5	**94.0**
12	Opus 0.75 + Tern 0.3@GS39	7.93	467.49	73.0	**42.6**	11.2	278.4	88.3
13	Folicur 0.4 + MBC 0.3 @GS65	8.17	486.59	72.8	**43.7**	11.2	242.1	88.2
14	Foliar Urea 40kg N/ha	7.46	426.85	72.2	41.1	**11.7**	249.0	90.6

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level, gross margins have not been analysed.

* over variable & application costs

Table 35. 1993 ADAS Boxworth, Field name: Thorofare - spring linseed, yield and quality

Treatment	Application date		Yield (%)	TGWT (g)	oil (%)	nitrogen (%)	GM* (£/ha)
	25 June	19 July					
IFS	As IFS, Appendix 24		2.20	7.17	41.0	3.27	
2	3.0 Compass	3.0 Compass	2.16	7.51	42.0	3.42	-60.82
3	0.5 Radar	Nil	2.26	7.26	41.1	3.44	-8.48
4	3.0 Compass	Nil	2.00	7.45	39.7	3.37	-53.81
5	1.5 Compass	Nil	2.30	7.33	40.8	3.33	-0.91
6	0.25 Radar	Nil	2.19	7.21	41.7	3.34	-9.44
7	Nil	1.5 Compass	2.17	7.09	41.0	3.44	-17.805
8	Nil	0.5 Folicur	2.26	7.26	40.5	3.36	-4.665
		SED	0.123	0.162	1.52	0.133	
		CV%	8.0	3.1	5.2	5.6	

*difference in margin from IFS

Table 36. 1993 ADAS Boxworth, field name: Long Field - winter wheat

Treatment	13 April	1 June	4 June	25 June	Yield (t/ha)	TGWT (g)	SPWT (kg/hl)	GM over IFS cost
GS	31	45	57	73/75				
IFS	As IFS, Appendix 25				6.59	46.09	78.27	-
2	2.3 Standup	Nothing	0.25 Radar	0.25 Radar	6.50	46.18	78.15	-12.36
3	1.6 Standup	0.4 Radar 1.0 Bravo	0.25 Radar	0.25 Radar	6.76	16.61	78.31	-17.42
4	1.6 Standup	Nothing	0.5 Radar	0.25 Radar	6.70	47.19	78.33	5.94
5	1.6 Standup	Nothing	0.25 Radar	Nothing	6.71	46.03	78.27	30.50
6	1.6 Standup	Nothing	0.25 Radar	0.25 Radar 312.5 Derosal	6.77	45.86	78.09	16.91
				P	0.074	0.485	0.939	
				SED TRT vs IFS	0.086	0.615	0.233	
				CV%	2.3	2.3	0.5	

Table 37. 1993 ADAS Boxworth, field name: Taylors, winter wheat, disease levels on 15 July

	13/5/93 (GS 39)	4/6/93 (GS 59)	Leaf 1 brown rust (%)	Leaf 1 septoria (%)	Leaf 2 brown rust (%)	Leaf 2 septoria (%)	Leaf 3 GLA (%)
IFS	As IFS, Appendix 26		19.42	6.28	16.2	11.32	4.4
2	0.4 Radar 1.0 Bravo	0.25 Radar 2.0 Mancozeb	10.05	4.0	16.6	7.47	5.4
3	0.4 Radar 1.0 Bravo	0.25 Radar 5.0 Bolda	8.36	3.46	14.2	3.88	14.5
4	0.4 Radar 1.0 Bravo	Nothing	30.09	9.60	35.0	8.75	0.1
5	0.4 Radar 1.0 Bravo	0.5 Radar 0.5 Mistral	9.15	2.05	8.5	3.88	16.6
6	0.37 Radar	0.25 Radar 5.0 Bolda	13.76	3.71	22.3	7.73	1.9
7	0.37 Radar	0.25 Radar 2.0 Mancozeb	15.45	5.54	24.5	12.72	2.7
8	0.37 Radar	0.25 Radar 2.0 Mancozeb	19.90	6.18	27.9	9.54	0.2
		SED	3.425	2.022	4.64	3.263	5.27
		P	0.001	0.039	0.001	NS	0.027
		CV%	30.7	56.1	31.7	56.5	129.7

Table 38. 1993 ADAS Boxworth, field Name: Taylors, winter wheat, yield and quality

	13/5/93 (GS 39)	4/6/93 (GS 59)	Yield (t/ha)	TGWT (g)	Specific weight (kg/hl)	Margin over IFS cost (£/ha)
IFS	As IFS, Appendix 26		9.52	39.92	80.9	-
2	0.4 Radar 1.0 Bravo	0.25 Radar 2.0 Mancozeb	9.74	41.23	80.8	3.14
3	0.4 Radar 1.0 Bravo	0.25 Radar 5.0 Bolda	9.86	41.35	81.5	11.00
4	0.4 Radar 1.0 Bravo	Nothing	9.11	39.14	80.3	-57.36
5	0.4 Radar 1.0 Bravo	0.5 Radar 0.5 Mistral	9.98	41.75	81.4	20.92
6	0.37 Radar	0.25 Radar 5.0 Bolda	9.51	39.64	81.0	-8.78
7	0.37 Radar	0.25 Radar 2.0 Mancozeb	9.56	40.09	80.9	5.12
8	0.37 Radar	0.25 Radar 2.0 Mancozeb	9.49	40.03	80.6	-3.84
		SED	0.141	0.966	0.216	
		P	0.001	NS	0.001	
		CV%	2.1	3.4	0.4	

Table 39. 1993 ADAS Boxworth, field name: Extra Close - winter wheat, disease levels on 15 July

Treatment	19 May	4 June	25 June	Leaf 1 septoria (%)	Leaf 2 septoria (%)
GS	37	57	73/75		
IFS	As IFS, Appendix 27			4.75	5.90
2	0.4 Radar 1.0 Bravo	Nothing	0.25 Radar	2.64	7.18
3	0.4 Radar 1.0 Bravo	0.25 Radar	0.25 Radar	1.83	5.15
4	0.25 Radar	0.4 Radar 1.0 Bravo	0.25 Radar	2.17	1.98
5	0.25 Radar	0.25 Radar	Nothing	2.68	12.14
6	0.25 Radar	0.25 Radar	0.25 Radar 312.5 Derosal	1.99	5.11
			P	0.59	0.025
			SED	1.728	2.505
			CV%	91.3	56.7

Table 40. 1993 ADAS Boxworth, field Name: Extra Close - winter wheat, yield and quality

	19 May	4 June	25 June	Yield (t/ha)	TGWT (g)	SPWT (kg/hl)	GM over IFS cost
GS	37	57	73/75				
IFS	As IFS, Appendix 27			5.78	52.12	77.89	-
2	0.4 Radar 1.0 Bravo	Nothing	0.25 Radar	6.01	50.45	78.05	15.66
3	0.4 Radar 1.0 Bravo	0.25 Radar	0.25 Radar	5.92	50.71	78.19	-11.00
4	0.25 Radar	0.4 Radar 1.0 Bravo	0.25 Radar	6.00	51.19	11.66	4.12
5	0.25 Radar	0.25 Radar	Nothing	5.92	49.21	77.87	33.06
6	0.25 Radar	0.25 Radar	0.25 Radar 312.5 Derosal	5.83	50.13	77.80	-5.62
			P	0.65	0.32	0.40	
			SED	0.158	1.23	0.255	
			CV%	3.8	3.4	0.5	

Table 41. 1994 ADAS Boxworth, Field name: Thorofare - Winter wheat, green leaf area and disease on 6 July

Treatment		Green leaf area			Leaf 4
		Leaf 1	Leaf 2	Leaf 3	*S. Triticii*
IFS	As IFS, Appendix 28	95.4	97.3	86.4	2.1
4	plus 0.9 l/ha Sportak	95.4	96.1	84.6	2.1
6	plus 1.0 l/ha Bravo	95.4	93.7	89.2	1.2
7	plus 0.3 l/ha Radar + 0.3 l/ha MBC	94.6	95.3	78.5	1.6
8	plus 0.6 l/ha Folicur	94.6	98.2	91.4	1.4
SE (9df)		1.02	1.43	3.03	0.95
CV%		2.2	3.0	7.0	106.3

Table 42. 1994 ADAS Boxworth, Field name: Thorofare - Winter wheat, yield, economics and quality

Treatment		Yield (t/ha)	SPWT (kg/hl)	TGWT (g)	Protein (%)	SDS	HFN	GM (£/ha)
IFS	As IFS, Appendix 28	9.3	82.7	43.1	9.8	86	366	844.40
2	1.5 l/ha Astix + 1.5 l/ha Oxytril instead of 1.9 l/ha Arelon + 0.75 l/ha Cheetah R + 1% Actipron	9.3	82.6	42.3	9.7	86	350	814.70
3	plus 1.25 l/ha 5c Cycocel	9.4	82.5	42.8	9.6	87	368	848.00
4	plus 0.9 l/ha Sportak	9.4	82.6	82.9	9.9	86	362	822.80
5	0.6 l/ha Starane + 1.25 l/ha Oxytril CM instead of 0.4 l/ha Starane + 0.25 l/ha Oxytril CM	9.2	82.9	43.1	9.7	88	366	805.10
6	plus 1.0 l/ha Bravo	9.3	82.3	43.3	9.7	88	358	831.80
7	plus 0.3 l/ha Radar + 0.3 l/ha MBC	9.3	82.9	43.8	9.7	88	361	834.10
8	plus 0.6 l/ha Folicur	9.3	82.6	43.1	9.8	86	361	831.80
SE (12df)		0.12	0.33	0.70	0.12	1.1	5.5	12.24
CV%		2.6	0.8	3.2	2.5	2.6	3.1	2.9

Table 43. 1994, ADAS Boxworth, Field: Long field - winter beans, yield, quality and economics

	Treatment	Yield (t/ha)	TGWT (g)	Protein (%)	GM (£/ha)
IFS	As IFS, Appendix 29	4.10	499	21.8	369.80
2	plus 2.3 l/ha Gesatop	4.07	482	21.3	353.40
3	plus 250 ml/ha Vargro cypermethrin	4.50	469	21.1	401.70
4	plus 1.0 l/ha Bravo + 1.1 kg/ha Benlate @ early flower	4.35	485	21.5	365.10
5	plus 1.0 l/ha Bravo + 1.1 kg/ha Benlate at early flower and pod fill	4.13	502	21.6	314.20
6	plus 1.0 l/ha Bravo + 1.1 kg/ha Benlate @ pod fill	4.08	475	21.9	337.90
SE (23df)		0.102	18.87	0.188	10.22
CV%		4.9	7.7	1.7	5.7

Table 44. 1994 ADAS Boxworth, Field name: Taylors - Winter wheat, green leaf area

	Treatment		Green leaf area		
			leaf 1	leaf 2	leaf 3
IFS	As IFS, Appendix 30		90.0	87.1	60.0
5	plus 0.9 l/ha Sportak (GS 30-31), no sanction (GS 39)		95.2	90.7	53.3
6	0.4 l/ha Radar + 1.0 l/ha Bravo instead of sanction (GS 39)		91.8	87.3	65.4
7	No Sanction (GS 39)		93.5	88.8	60.1
8	plus 0.3 l/ha Radar 0.3 l/ha MBC (GS 59)		94.4	88.8	73.8
9	plus 0.6 l/ha Folicur (GS 59)		94.1	92.4	79.7
		SE (36 df)	1.67	3.47	5.80
		CV%	3.6	7.8	18.2

Table 45. 1994 ADAS Boxworth, Field name: Taylors - Winter wheat, yield economics and quality

	Tr eatment	Yield (t/ha)	TGWT (g)	SPWT (kg/hl)	Protein (%)	SDS	HFN	GM (£/ha)
IFS	As IFS, Appendix 30	8.12	38.8	78.1	10.8	82.3	397	688.20
2	1.5 l/ha Astix + 1.5 l/ha Oxytril instead of 1.9 l/ha Arelon + 0.75 l/ha Cheetah R + Actipron 1% (GS 22)	8.14	38.4	78.0	10.9	83.0	387	659.40
3	22.5 g/ha Ally + 1.0 l/ha Astix instead of 7.5 g/ha Ally + 0.5 l/ha Astix (GS 30-31)	8.11	40.0	78.5	10.9	82.5	387	660.70
4	0.5 l/ha Cycocel 5C instead of 1.75 l/ha Stand-up (GS 30-31)	8.32	39.0	77.8	10.8	86.0	367	701.90
5	plus 0.9 l/ha Sportak (GS 30-31), no sanction (GS 39)	8.27	38.4	78.3	10.9	84.5	381	703.30
6	0.4 l/ha Radar + 1.0 l/ha Bravo instead of sanction (GS 39)	8.00	38.9	77.9	10.5	78.8	384	652.20
7	No Sanction (GS 39)	7.92	38.3	77.9	11.1	83.8	366	704.20
8	plus 0.3 l/ha Radar + 0.3 l/ha MBC (GS 59)	8.22	39.3	78.4	10.9	83.5	389	688.20
9	plus 0.6 l/ha Folicur (GS 59)	8.17	39.7	78.5	10.9	81.5	402	680.80
	SE (36 df)	0.123	0.48	0.37	0.13	1.95	11.1	12.30
	CV%	3.0	2.5	1.0	2.4	4.7	5.7	3.6

Table 46. 1994 ADAS Boxworth, field name: Barons Hill - Linseed, yield, quality and economics

Treatment	Application date		Yield	TGWT	oil	Nitrogen	GM
Date	28 June 1994	14 July 1994	(t/ha)	(g)	(%)	(%)	(£/ha)
Growth stage	Early flower	Bolls developing					
IFS	As IFS, Appendix 31		0.77	6.59	39.6	3.22	3.6
2	1.0 l/ha Corbel		0.83	6.62	38.0	3.30	-15.6
3	0.5 l/ha Corbel		0.75	6.61	38.0	3.24	-15.9
4	0.5 l/ha Corbel	0.5 l/ha Corbel	0.67	6.34	37.4	3.28	-42.4
5	1.0 l/ha Folicur		0.74	6.50	38.0	3.29	-32.1
6	0.5 l/ha Folicur		0.71	6.33	38.0	3.26	-23.2
7	0.5 l/ha Folicur	0.5 l/ha Folicur	0.84	6.50	37.7	3.32	-24.8
		SE (30 df)	0.073	0.098	2.33	0.097	9.78
		CV%	19.0	3.0	12.1	6.0	140.2

Table 47. 1994 ADAS Boxworth, field name: Barons Hill - Linseed, disease levels on 14 July

Treatment	Application date		Downy mildew	senescence
Date	28 June 1994	14 July 1994	(%/plant)	(% / plant)
Growth stage	Early flower	Bolls developing		
IFS	As IFS, Appendix 31		94.6	61.9
2	1.0 l/ha Corbel		0	58.7
3	0.5 l/ha Corbel		8.0	61.2
4	0.5 l/ha Corbel	0.5 l/ha Corbel	3.7	60.0
5	1.0 l/ha Folicur		1.3	60.0
6	0.5 l/ha Folicur		5.5	62.5
7	0.5 l/ha Folicur	0.5 l/ha Folicur	27.5	58.7
		SE (30 df)	6.44	3.26
		CV%	30.4	10.7

Table 48. 1994 ADAS Boxworth, field name: Barons Hill - Linseed, disease levels on 21 July

Treatment	Application date		downy mildew	senescence	GLA
Date	28 June 1994	14 July 1994	(% / plant)	(% / plant)	(% / plant)
Growth stage	Early flower	Bolls developing			
IFS	As IFS, Appendix 31		100.0	76.6	0.12
2	1.0 l/ha Corbel		71.2	70.8	0.88
3	0.5 l/ha Corbel		88.7	73.8	0.18
4	0.5 l/ha Corbel	0.5 l/ha Corbel	35.0	73.3	0.10
5	1.0 l/ha Folicur		58.7	71.3	0.08
6	0.5 l/ha Folicur		93.7	67.5	0.03
7	0.5 l/ha Folicur	0.5 l/ha Folicur	56.2	75.0	0.05
		SE (30 df)	6.42	2.77	0.148
		CV%	16.0	7.5	166.3

Table 49. 1994 ADAS Boxworth, Field name: Extra Close - Linseed, disease levels on 14 July

Treatment	Application date		downy mildew	senescence
Date	28 June 1994	14 July 1994	(%/plant)	(%/plant)
Growth stage	Early flower	Bolls developing		
IFS	As IFS, Appendix 32		100.0	48.4
2	1.0 l/ha Corbel		31.3	46.7
3	0.5 l/ha Corbel		62.5	41.2
4	0.5 l/ha Corbel	0.5 l/ha Corbel	30.0	41.2
5	1.5 l/ha Compass		35.0	42.5
6	0.75 l/ha Compass		96.2	40.0
7	0.75 l/ha Compass	0.75 l/ha Compass	91.2	43.7
		SE (30 df)	6.65	3.43
		CV%	17.8	15.3

Table 50. 1994 ADAS Boxworth, Field name: Extra Close - Linseed, disease levels on 21 July

Treatment	Application date		Downy mildew	senescence
Date	28 June 1994	14 July 1994	(% / plant)	(% / plant)
Growth stage	Early flower	Bolls developing		
IFS	As IFS, Appendix 32		100.0	65.6
2	1.0 l/ha Corbel		96.5	60.0
3	0.5 l/ha Corbel		99.3	61.3
4	0.5 l/ha Corbel	0.5 l/ha Corbel	95.3	60.0
5	1.5 l/ha Compass		86.8	61.3
6	0.75 l/ha Compass		99.5	63.3
7	0.75 l/ha Compass	0.75 l/ha Compass	97.0	58.8
		SE (30 df)	1.44	2.31
		CV%	3.0	7.4

Table 51. 1994 ADAS Boxworth, Field name: Extra Close - Linseed, yield, economics and quality

Treatment	Application date		yield	TGWT	oil	Nitrogen	GM
Date	28 June 1994	14 July 1994	(t/ha)	(g)	(%)	(%)	(£/ha)
Growth stage	Early flower	Bolls developing					
IFS	As IFS, Appendix 32		1.20	7.20	39.2	3.35	60.90
2	1.0 l/ha Corbel		1.14	7.44	37.9	3.53	26.80
3	0.5 l/ha Corbel		1.33	7.42	38.6	3.38	62.60
4	0.5 l/ha Corbel	0.5 l/ha Corbel	1.27	7.38	38.5	3.44	37.90
5	1.5 l/ha Compass		1.30	7.30	39.3	3.35	39.60
6	0.75 l/ha Compass		1.22	7.36	38.6	3.37	43.80
7	0.75 l/ha Compass	0.75 l/ha Compass	1.30	7.36	38.3	3.39	32.80
		SE (30 df)	0.110	0.075	0.24	0.051	14.85
		CV%	17.8	2.1	1.3	3.0	61.0

Table 52. 1994 ADAS Boxworth, Field name: Childerley - Winter wheat, green leaf area on 6 July

Treatment		Green leaf area (%)			
		Leaf 1	Leaf 2	Leaf 3	Leaf 4
IFS	As IFS, Appendix 33	94.3	93.8	89.2	32.7
5	plus 0.9 l/ha Sportak 45	92.5	95.4	89.6	27.4
6	plus 1.0 l/ha Bravo	95.1	95.8	88.0	31.0
7	plus 0.3 l/ha Radar + 0.3 l/ha MBC	95.4	95.9	87.4	15.8
8	plus 0.6 l/ha Folicur	95.7	95.1	85.5	46.0
SE (12df)		1.04	1.14	3.17	4.27
CV%		2.2	2.4	7.2	27.4

Table 53. 1994 ADAS Boxworth, Field name: Childerley - Winter wheat, yield, economics and quality

Treatment		Yield (t/ha)	GM (£/ha)	SPWT (kg/hl)	TGWT (g)	Protein (%)	SDS	HFN
IFS	As IFS, Appendix 33	8.88	818.30	79.6	33.8	10.3	88.3	411
2	plus 2.9 l/ha Arelon 1.0 l/ha Panther	9.12	811.00	80.0	34.5	10.6	88.5	410
3	0.5 l/ha Astix instead of 1.0 l/ha Oxytril CM + 1.5 l/ha Astix	8.84	802.90	79.5	32.4	10.6	88.3	393
4	plus 1.25 l/ha Standup	8.80	801.40	77.9	32.8	10.5	90.3	419
5	plus 0.9 l/ha Sportak 45	8.93	795.80	79.1	33.3	10.6	88.8	405
6	plus 1.0 l/ha Bravo	8.96	814.40	80.1	34.2	10.6	93.8	402
7	plus 0.3 l/ha Radar + 0.3 l/ha MBC	8.84	816.30	79.1	33.4	10.4	90.5	405
8	plus 0.6 l/ha Folicur	8.96	825.80	79.7	34.7	10.2	89.5	403
	SE (12df)	0.063	6.26	0.42	0.58	0.21	2.29	7.23
	CV%	1.4	1.5	1.0	3.5	4.0	5.1	3.6

Table 54. 1995 ADAS Boxworth, Field name: Thorofare - Winter Beans, Disease Assessment 18 July 1995

	Treatment	Rust %	Chocolate spot %	Aschochyta %
1	As IFS, Appendix 34	18.7	0.9	1.4
4	+ 1.0 l/ha Bravo and 1.1 kg/ha Benlate on 5 May 1995	18.2	0.8	1.4
5	+ 1.0 l/ha Bravo and 1.1 kg/ha Benlate on 26 June 1995	11.7	0.6	0.6
6	+ 1.0 l/ha Bravo and 1.1 kg/ha Benlate on 5 May 1995 and 26 June 1995	11.1	0.6	0.8
7	+ 3.0 l/ha Compass on 2 June 1995	15.8	0.8	0.8
	F.pr	<0.001	NS	0.005
	SED	0.87	0.23	0.16
	LSD (df = 21)	1.81	0.48	0.34
	CV %	11.1	62.3	30.5

Table 55. 1995 ADAS Boxworth, Field name: Thorofare - Winter Beans, Seed Yield, Economics & Quality

	Treatment	Yield t/ha	GM* £/ha	TGW g	Nitrogen content (%)
1	As IFS, Appendix 34	3.28	383	510.4	4.03
2	+2.3 l/ha Simazine, - 1.0 l/ha Laser and 0.8% Actipron	3.24	409	528.9	4.03
3	+ 250 ml/ha Ambush C	3.28	376	508.3	4.00
4	+ 1.0 l/ha Bravo and 1.1 kg/ha Benlate on 5 May 1995	3.68	40	558.1	4.05
5	+ 1.0 l/ha Bravo and 1.1 kg/ha Benlate on 26 June 1995	3.64	399	533.2	4.04
6	+ 1.0 l/ha Bravo and 1.1 kg/ha Benlate on 5 May 1995 and 26 June 1995	3.77	386	551.4	4.08
7	+ 3.0 l/ha Compass on 2 June 1995	3.85	428	557.3	4.12
	F.pr	<0.001	NS	0.023	NS
	SED	0.111	14.5	12.98	0.045
	LSD (df = 21)	0.231	30.1	27.00	0.094
	CV %	6.4	7.3	4.9	2.2

* over variable & application costs

Table 56. 1995 ADAS Boxworth, Field name: Long Field - winter wheat cv. Spark, height tiller number and weed populations

	Treatment	Height (cm) 25 July	Fertile tillers (/m²) 25 July	Vol. beans (/m²) 2 June	Field bindweed (/m²) 2 June	Meadow brome (/m²) 28 June	Barren brome (/m²) 28 June
1	As IFS, Appendix 35	86.3	575	0	0	5.7	18.3
2	plus 2.9 l/ha Arelon and 1.0 l/ha Panther. minus 1.8 l/ha Arelon, 0.75 l/ha Cheetah and 0.5% Actipron on 2 February 1995	-	-	0	0.5	5.7	7.0
3	No herbicide on 2 February 1995	-	-	0	0.5	7.5	24.8
4	plus2.3 l/ha Arelon and 2.5 l/ha stomp, minus1.8 l/ha Arelon, 0.75 l/ha Cheetah and 0.5% Actipron on 2 February 1995	-	-	0	0.5	9.5	17.3
5	plus1.25 l/ha Astix , minus1.25 l/ha Astix and 0.75 l/ha Oxytril on 4 April 1995	-	-	0.3	0.5	-	-
6	- spring herbicide on 4 April 1995	-	-	13.3	0.75	-	-
7	- PGR on 4 April 1995	95.3	518	-	-	-	-
8	- Cheetah R on 3 May 1995	-	-	0	0.3	6.0	14.0
9	+ 0.25 l/ha Radar on 29 June 1996	-	-	-	-	-	-
10	+ 140 g/ha Aphox on 5 July 1995	-	-	-	-	-	-
	F.pr	0.009	NS	<0.001	NS	NS	NS
	SED	0.61	23.0	0.20	0.31	2.46	6.17
	LSD (df)	2.62 (2	98.97 (2)	0.42 (18)	0.65 (18)	5.36 (12)	13.44 (12)
	CV %	1.3	8.4	20.4	144.8	71.4	76.0

Table 57. 1995 ADAS Boxworth, Field name: Long Field - winter wheat, Grain Yield, Economics & Grain Quality

	Treatment	Yield t/ha	GM* £/ha	SPWT kg/hl	TGW g	Protein %	HFN	SDS
1	As IFS, Appendix 35	6.93	495	79.3	34.5	11.1	355	90.3
2	+2.9 l/ha Arelon and 1.0 l/ha Panther - 1.8 l/ha Arelon, 0.75 l/ha Cheetah and 0.5% Actipron on 2 February 1995	7.30	529	79.5	34.5	10.9	366	85.5
3	No herbicide on 2 February 1995	6.60	490	79.0	35.3	11.2	376	85.3
4	+2.3 l/ha Arelon and 2.5 l/ha stomp - 1.8 l/ha Arelon, 0.75 l/ha Cheetah and 0.5% Actipron on 2 February 1995	6.88	482	79.1	33.9	11.1	381	89.3
5	+1.25 l/ha Astix , - 1.25 l/ha Astix and 0.75 l/ha Oxytril on 4 April 1995	7.21	529	79.4	34.3	11.2	323	85.3
6	- spring herbicide on 4 April 1995	7.14	533	79.6	34.3	11.1	349	84.5
7	- PGR on 4 April 1995	6.67	466	80.5	36.0	11.3	363	85.3
8	- Cheetah R on 3 May 1995	7.13	573	79.8	35.1	11.0	347	90.5
9	+ 0.25 l/ha Radar on 29 June 1996	7.22	510	79.2	34.0	10.1	354	88.0
10	+ 140 g/ha Aphox on 5 July 1995	7.36	533	79.5	33.3	11.0	370	87.0
	F.pr	NS	0.00	0.035	NS	NS	NS	NS
	SED	0.17	17.6	0.27	0.56	0.16	12.3	3.13
	LSD (df = 27)	0.36	36.0	0.55	1.15	0.33	25.2	6.42
	CV %	5.0	6.8	0.7	3.2	2.8	6.8	7.2

* over variable & application costs

Table 58. 1995 ADAS Boxworth, Field name: Taylors - Linseed, Yield, Economics & Quality

	Treatment	Yield t/ha	GM* £/ha	Oil content (%)	Nitrogen content (%)
1	As IFS, Appendix 36	0.60	-12	38.9	4.07
2	- Fusilade on 11 July 1995	0.57	13	38.9	4.12
3	+ 15 kg/ha N on 3 May 1995	0.62	-21	38.9	4.04
4	+ 30 g/ha Ally on 20 July 1995	0.64	-28	38.9	3.98
5	- Fusilade + 1.0 l/ha Laser and 1.6 l/ha Actipron on 20 July 1995	0.66	-14	39.2	4.08
6	+ 1.5 l/ha Compass on 20 July 1995	0.67	-18	39.0	4.08
7	+ 3.0 l/ha Compass on 20 July 1995	0.63	-37	39.0	4.08
	F.pr	0.021	<0.001	NS	NS
	SED	0.023	3.6	0.14	0.048
	LSD (df = 37)	0.046	7.3	0.28	0.097
	CV %	7.5	49.0	0.7	2.3

* over variable & application costs

Table 59. 1995 ADAS Boxworth, Field name: Barons Hill - winter wheat , Agronomic and Black-grass data

	Treatment	Crop height on 25 July (cm)	Fertile tillers on 25 July (No./m^2)	Black-grass on 28 June (Panicles/m^2)
1	As IFS, Appendix 37	78.3	485	115.0
2	+ 2.9 l/ha Arelon & 1.0 l/ha Panther on 30 Jan			51.3
3	- PGR on 4 April 1995	89.8	529	
	F.pr	0.003	0.10	0.021
	SED	1.27	7.52	14.22
	LSD (df = 7)	3.00	17.78	33.63
	%CV	2.7	2.6	24.9

Table 60. 1995 ADAS Boxworth, Field name: Barons Hill - winter wheat, Grain Yield, Economics & Grain Quality

	Treatment	Yield t/ha	GM* £/ha	SPWT kg/hl	TGW g	Protein %	HFN	SDS
1	As IFS, Appendix 37	7.36	619	83.5	40.8	10.0	361	78.2
2	+ 2.9 l/ha Arelon & 1.0 l/ha Panther on 30 January	8.04	656	83.8	41.6	10.6	364	82.3
3	- PGR on 4 April 1995	7.53	645	83.6	40.9	10.5	370	78.0
4	+ 30g/ha Ally on 3 May	7.46	607	83.5	41.9	10.3	364	77.3
5	+ 40 kg/ha N on 3 May	7.73	643	83.8	40.3	10.8	372	83.3
6	+ 0.9 l/ha Sportak 45 on 4 April	8.20	679	83.8	42.5	10.3	364	78.0
7	+ 0.75 l/ha Starane on 3 May 1995	7.00	567	83.9	41.0	10.1	361	77.0
8	+ 0.5 l/ha Radar on 3 May GS32-33	7.52	612	83.1	40.1	9.7	369	76.5
9	Radar 0.25 l/ha, - Folicur 30 June	7.77	659	83.5	40.7	9.8	363	77.8
10	+ 140 g/ha Aphox on 5 July 1995	7.50	628	83.9	42.0	10.1	359	78.3
	F.pr	0.02	0.040	0.019	NS	<0.001	NS	NS
	SED	0.248	24.80	0.187	0.77	0.183	8.7	3.13
	LSD (df = 35)	0.504	50.37	0.380	1.56	0.372	17.6	6.36
	CV %	5.7	6.8	0.4	3.3	3.1	4.1	6.9

* over variable & application costs

Table 61. 1995 ADAS Boxworth, Field name: Extra Close - winter wheat, Agronomic and Black-grass data

	Treatment	Crop height on 25 July (cm)	Fertile tillers on 25 July (No./m^2)	Black-grass on 28 June (Panicles/m^2)
1	As IFS, Appendix 38	78.0	506.5	133
2	+2.9 l/ha Arelon and 1.0 l/ha Panther on 30 Jan, - 3.7 l/ha Arelon and 1.0 l/ha Panther on 21 Nov. 94	-	-	125
3	- PGR on 4 April 1995	89.5	497.5	-
7	+ 3.0 l/ha cheetah on 3 May 1995	-	-	24
	F.pr	<0.001	NS	0.017
	SED	0.47	9.25	20.7
	LSD (df)	1.50 (3)	29.43 (3)	50.65 (6)
	CV %	1.1	3.7	44.0

Table 62. 1995 ADAS Boxworth, Field name: Extra Close - winter wheat, Grain Yield, Economics & Grain Quality

	Treatment	Yield t/ha	GM* £/ha	SPWT kg/hl	TGW g	Protein %	HFN	SDS
1	As IFS, Appendix 38	7.36	590	84.8	42.1	10.7	318	89.8
2	+2.9 l/ha Arelon and 1.0 l/ha Panther on 30 Jan, - 3.7 l/ha Arelon and 1.0 l/ha Panther on 21 Nov. 94	7.26	577	84.8	41.6	11.1	342	87.8
3	- PGR on 4 April 1995	7.29	592	84.9	41.9	11.1	330	81.5
4	+ 30g/ha Ally on 3 May 1995	7.01	547	84.6	41.9	10.9	328	94.0
5	+ 80 kg/ha Nitrogen on 3 May 1995	7.59	609	84.4	41.7	12.1	340	91.0
6	+ 0.9 l/ha Sportak 45 on 4 April	7.67	596	84.6	42.3	11.0	359	91.0
7	+ 3.0 l/ha cheetah on 3 May 1995	7.91	586	84.6	41.1	10.5	330	85.8
8	+ 0.75 l/ha Starane on 3 May 1995	7.22	552	84.7	42.3	10.6	328	88.0
9	+ 0.5 l/ha Radar on 3 May GS 32-37	7.28	559	84.8	42.2	10.8	344	91.8
10	+ 1.0 l/ha Bravo on 24 May 1995	7.74	623	84.6	42.1	10.7	346	92.3
11	+0.25 l/ha Radar, - 0.25 l/ha Folicur on 29 June 1995	7.69	622	84.7	41.9	10.7	329	88.8
12	+ 140 g/ha Aphox on 5 July 1995	7.46	595	84.9	41.9	10.9	336	90.8
	F.pr	NS	NS	NS	NS	<0.001	NS	NS
	SED	0.210	21.0	0.18	0.36	0.16	7.9	1.62
	LSD (df = 35)	0.427	42.7	0.37	0.73	0.32	16.17	3.29
	CV %	5.6	7.2	0.4	1.7	2.9	4.7	3.6

* over variable & application costs

Table 63. 1995 ADAS Boxworth, Field name: Childerley - winter wheat , Crop height and weed assessments

	Treatment	Crop height (cm) 25 July	Cleavers (No./m^2) 2 June	Barren Brome (No./m^2) 28 June	Meadow Brome (No./m^2) 28 June
1	As IFS, Appendix 39	99.0	0.4	36.7	0.3
2	+2.9 l/ha Arelon and 1.0 l/ha Panther - 1.8 l/ha Arelon and 0.75 l/ha Cheetah R on 21 March 1995	-	1.6	-	-
3	+2.3 l/ha Arelon and 2.5 l/ha Stomp - 1.8 l/ha Arelon and 0.75 l/ha Cheetah R on 21 March 1995	-	0.6	-	-
4	- herbicide on 21 March 1995	-	2.0	44.7	0.4
5	+ 2.2 l/ha Atlas CCC at GS 30	92.4	-	-	-
6	+ 30 g/ha ally	-	1.5	-	-
9	- cheetah R on 3 May 1995	-	1.9	42.1	1.6
	F.pr	<0.001	NS	NS	NS
	SED	0.80	0.52	6.62	0.47
	LSD (df)	1.89 (7)	1.07 (34)	14.20 (14)	1.01 (14)
	CV %	2.4	110.8	45.4	177.3

Table 64. 1995 ADAS Boxworth, Field name: Childerley - winter wheat, Disease assessment 20 July 1995

	Treatment	L1M % leaf infected	L1S % leaf infected	L1GL %	L2M % leaf infected	L2GL %	Eyespot % tillers infected
1	As IFS, Appendix 39	0.1	0	24.9	0.1	9.4	1.3
8	+ 0.5 l/ha Radar and 0.5 l/ha Bravo at GS 32	0	0.1	40.6	0.1	12.8	2.5
10	+ 0.25 l/ha Radar at GS 71	Trace	0	35.3	0.1	13.2	0
	F.pr	NS	NS	NS	NS	NS	NS
	SED	0.07	0.07	5.11	0.05	3.20	1.25
	LSD (df = 8)	0.16	0.16	11.78	0.12	7.38	2.88
	CV %	447.1	374.2	43.0	181.2	76.5	282.8

Table 65. 1995 ADAS Boxworth, Field name: Childerley - winter wheat, Grain Yield, Economics & Grain Quality

	Treatment	Yield t/ha	GM* £/ha	SPWT kg/hl	TGW g	Protein %	HFN	SDS
1	As IFS, Appendix 39	6.23	422	69.4	43.7	11.3	266	76.5
2	+2.9 l/ha Arelon and 1.0 l/ha Panther - 1.8 l/ha Arelon and 0.75 l/ha Cheetah R on 21 March 1995	6.40	437	74.0	43.9	11.0	283	73.5
3	+2.3 l/ha Arelon and 2.5 l/ha Stomp - 1.8 l/ha Arelon and 0.75 l/ha Cheetah R on 21 March 1995	6.36	428	65.6	44.2	11.0	288	73.0
4	- herbicide on 21 March 1995	6.13	441	68.6	43.9	11.2	282	75.8
5	+ 2.2 l/ha Atlas CCC at GS 30	6.03	392	71.7	42.0	11.1	287	76.5
6	+ 30 g/ha ally	6.34	412	75.4	40.6	11.1	278	74.8
7	+ 20 kg/ha N	6.49	424	69.8	42.6	11.3	281	76.0
8	+ 0.5 l/ha Radar and 0.5 l/ha Bravo at GS 32	6.14	388	70.9	43.1	10.8	271	76.3
9	- cheetah R on 3 May 1995	6.28	485	71.8	43.1	11.3	278	76.8
10	+ 0.25 l/ha Radar at GS 71	6.36	420	69.5	44.4	10.9	268	74.1
11	+ Foliar urea 40 kg/ha N at GS 71	6.32	413	65.2	43.6	11.7	276	77.5
	F.pr	NS	<0.001	NS	NS	0.001	NS	NS
	SED	0.135	13.52	2.31	0.82	0.13	6.3	2.06
	LSD (df)	0.270 (68)	27.04 (68)	4.62 (57)	1.64 (61)	0.26 (70)	12.6 (70)	4.12 (70)
	CV %	6.1	9.0	9.3	5.4	3.3	6.4	7.7

* over variable & application costs

Table 66. 1996 ADAS Boxworth, Field name: Thorofare - Winter wheat, Yield and quality data

	Treatment	Yield t/.ha	TGWT g	SPWT kg/hl	SDS	HFN	Protein (log %)	GM
1	As IFS, Appendix 40	10.1	40.1	78.3	49.0	309	2.34	947.3
2	4.2 l/ha Stefes IPU instead of 4.0 l/ha Stefes IPU and 2.0 l/ha Stomp on 15 January 1996	10.1	40.7	78.5	46.8	316	2.33	965.5
3	1 pack Hawk and 1.0 l/ha Stefes IPU instead of 4.0 l/ha Stefes IPU and 2.0 l/ha Stomp on 16 January 1996	10.1	40.9	78.0	47.0	307	2.32	943.1
4	+ 2.3 l/ha Barclays Holdup on 24 April 1996	10.1	39.9	77.5	46.2	321	2.31	935.3
5	+ 0.9 l/ha Sportak 45 on 25 April 1996	10.3	41.0	78.2	49.0	321	2.33	949.0
6	0.5 l/ha Opus and 1.0 l/ha Bravo instead of 0.5 l/ha Radar on 13 June 1996	10.3	40.0	78.3	47.8	315	2.34	960.3
7	0.5 l/ha Opus instead of 0.5 l/ha Radar on 13 June 1996	10.1	40.1	77.9	50.3	328	2.34	653.3
8	40 kg/ha foliar Urea on 11 July 1996	10.3	40.2	78.5	52.3	310	2.40	954.3
9	No Radar on 7 June 1996	10.1	39.4	78.1	47.1	314	2.32	973.9
10	+ 0.5 l/ha Headlands Addstem on 11 July 1996	10.2	41.1	78.2	50.5	324	2.34	950.5
11	+ 0.5 l/ha Opus on 11 July 1996	10.1	40.2	78.1	49.9	315	2.34	926.9
12	+ 0.25 l/ha Radar on 11 July 1996	10.1	39.4	77.9	46.9	304	2.29	933.4
	SED (91df)	0.11	0.83	0.30	2.01	14.45	0.022	11.31
	Error mean square	0.04	2.73	0.37	15.77	812.7	0.002	493.4
	P	0.05	NS	0.05	NS	NS	0.05	0.05

Table 67. 1996 ADAS Boxworth, Field name: Long field - winter wheat, Yield and quality data

	Treatment	Yield	SPWT	TGWT g	SDS	HFN (log)	Protein (log)	GM
1	As IFS, Appendix 41	8.57	79.1	42.3	35.7	5.97	2.21	806
2	4.2 l/ha Stefes IPU instead of 4.0 l/ha Stefes IPU and 2.0 l/ha Stomp	8.57	79.3	43.0	40.0	5.83	2.34	821
3	1 pack Hawk and 1.0 l/ha Stefes IPU instead of 4.0 l/ha Stefes IPU and 2.0 l/ha Stomp	8.65	79.5	44.0	36.2	5.78	2.24	805
4	+ 2.3 l/ha Barclays Holdup	6.56	78.4	41.5	36.9	5.79	2.21	789
5	+ 0.9 l/ha Sportak 45	8.48	79.1	42.9	37.0	5.87	2.24	772
6	0.5 l/ha Opus and 1.0 l/ha Bravo instead of 0.5 l/ha Radar on 13 June 1996	8.77	79.4	42.9	36.4	5.93	2.20	819
7	0.5 l/ha Opus instead of 0.5 l/ha Radar	8.66	79.6	43.9	38.4	5.68	2.24	813
8	40 kg/ha foliar Urea	8.58	79.7	43.9	38.7	5.82	2.26	789
9	No Radar	8.60	79.3	42.1	36.3	5.87	2.22	832
10	+ 0.5 l/ha Headlands Addstem	8.60	79.2	42.2	37.4	5.71	2.26	799
11	+ 0.5 l/ha Opus	8.53	79.6	44.3	38.5	5.87	2.24	778
12	+ 0.25 l/ha Radar	8.66	79.5	42.1	37.5	5.94	2.24	800
	SED (43 df)	0.132	0.257	0.999	1.498	0.132	0.024	13.23
	Error Mean Square	0.032	0.121	1.815	3.52	0.025	0.0009	318.4
	P	NS	<0.05	NS	<0.05	NS	NS	<0.05

Table 68. 1996 ADAS Boxworth, Field name: Taylors - Winter wheat, Black-grass populations (plants/m²)

	Treatment	Black-grass (plants/m²)	Knotgrass (√plants/m²)
IFS	As IFS, Appendix 42	12.95	1.47
2	4.2 l/ha Stefes IPU instead of 4.0 l/ha Stefes IPU and 2.0 l/ha Stomp on 15 January 1996	13.85	2.83
3	1 pack Hawk and 1.0 l/ha Stefes IPU instead of 4.0 l/ha Stefes IPU and 2.0 l/ha Stomp on 15 January 1996	4.64	1.16
	SED (10 df)	2.723	0.0401
	Error mean square	13.37	0.287
	P	<0.05	<0.02

Table 69. 1996 ADAS Boxworth, Field name: Taylors - Winter wheat, Yield and quality data

	Treatment	Yield t/ha	GM	SPWT log kg/hl	HFN	SDS	Protein	TGWT g
1	As IFS, Appendix 42	9.16	1073	4.43	363	81.	10.6	40.5
2	4.2 l/ha Stefes IPU instead of 4.0 l/ha stefes IPU and 2.0 l/ha Stomp	9.48	1096	4.44	367	85.	10.7	41.2
3	1 pack Hawk and 1.0 l/ha Stefes IPU instead of 4.0 l/ha Stefes IPU and 2.0 l/ha Stomp	9.39	1061	4.43	367	78.	10.8	40.6
4	+ 2.3 l/ha Barclays Holdup	9.42	1059	4.43	364	82.	10.7	40.5
5	+ 0.9 l/ha Sportak 45	9.52	1061	4.43	367	82.	10.7	41.2
6	0.5 l/ha Opus and 1.0 l/ha Bravo instead of 0.5 l/ha Radar	9.36	1059	4.44	355	76.	10.8	40.2
7	0.5 l/ha Opus instead of 0.5 l/ha Radar	9.22	1049	4.43	362	83.	10.6	40.5
8	40 kg/ha foliar Urea	9.39	1052	4.44	350	83.	11.3	39.9
9	- Radar	9.10	1059	4.43	361	83.	10.7	40.5
10	+ 0.5 l/ha Headlands Addstem	9.43	1066	4.43	365	83.	10.6	41.1
11	+ 0.5 l/ha Opus	9.31	1036	4.43	359	82.	10.6	39.8
12	+ 0.25 l/ha Radar	9.40	1057	4.42	371	82.	10.8	40.7
	SED (45 df)	0.14	17.	0.005	8.	4.	0.1	0.7
	Error mean square	0.03	514.	0.000057	133.	36.	0.0	0.8
	P	NS	<0.	<0.05	NS	NS	<0.0	NS

Table 70. 1996 ADAS Boxworth, Field name: Barons hill - Winter beans, yield and quality

Treatment	Yield	Grain nitrogen (%)		TGWT (g)	GM (£/ha)
		Actual	log		
As IFS, Appendix 43	1.74	4.29	1.46	705.8	182.6
Plus 2.3 l/ha Gesatop on 20 November 1995	1.62	4.30	1.46	705.6	153.8
Plus 0.25 l/ha Cypermethrin on 25 April 1996	1.74	4.26	1.45	711.7	174.7
Plus 1.0 l/ha Bravo and 0.5 l/ha MBC on 4 June 1996	1.89	4.23	1.44	704.1	186.0
Plus 1.0 l/ha Bravo and 0.5 l/ha MBC on 11 July 1996	1.82	4.25	1.45	720.4	176.8
Plus 1.0 l/ha Bravo and 0.5 l/ha MBC on 5 May 1995 and 11 July 1996	1.75	4.35	1.47	752.1	152.2
SED (27df)	0.175		0.016	32.38	22.79
Error mean square	0.077		0.0007	2646	1297
P	NS		NS	NS	NS

Table 71. 1996 ADAS Boxworth, Field name: Extra Close - Winter beans, yield and quality

Treatment	TGWT (g)		Yield (t/ha)	Grain nitrogen (%)		GM (£/ha)	
	Actual	(log g)		Actual	Log	Actual	Log
As IFS, Appendix 44	654.9	6.49	3.52	4.29	1.46	412.	6.02
Plus 2.3 l/ha Gesatop on 20 November 1995	681.2	6.52	3.31	4.08	1.40	368.	5.91
Plus 0.25 l/ha Cypermethrin on 25 April 1996	650.3	6.47	3.49	4.24	1.44	402.	5.99
Plus 1.0 l/ha Bravo and 0.5 l/ha MBC on 4 June 1996	664.3	6.50	3.75	4.32	1.47	431.	6.06
Plus 1.0 l/ha Bravo and 0.5 l/ha MBC on 11 July 1996	652.6	6.48	3.54	4.30	1.46	404.	5.99
Plus 1.0 l/ha Bravo and 0.5 l/ha MBC on 5 May 1995 and 11 July 1996	665.5	6.50	3.68	4.29	1.46	402.	6.00
SED (31 df)		0.019	0.15		0.022		0.051
Error mean square		0.001	0.06		0.002		0.007
P		NS	NS		NS		NS

Table 72. 1996 ADAS Boxworth, Field name: Childerley - Winter linseed, Plant numbers (/m²)

Treatment	3 April	11 June
As IFS, Appendix 45	392.8	19.75
+ 1.0 l/ha Afalon on 4 October 1995	359.3	-
+ 2.0 l/ha Butisan S on 4 October 1995	214.0	-
+ 2.0 l/ha Stefes Lenacil on 2 February 1996	354.0	-
+ 0.75 l/ha Fortrol on 2 February 1996	342.3	-
No herbicide on 29 April 1996	364.8	18.51
2.0 l/ha Basagran and 1.0 l/ha Vindex instead of 30 g/ha Ally on 29 April 1996	-	19.60
40 g/ha Eagle instead of 30 g/ha Ally on 29 April 1996	-	19.88
SED	24.36	0.564
Error mean square	1187	0.637
P	<0.001	NS

Table 73. 1996 ADAS Boxworth, Field name: Childerley - Winter linseed. Weed populations (√plants/m²)

Treatment	Ivy speedwell	Chickweed	Cleaver
As IFS, Appendix 45	1.22	2.16	2.14
+ 1.0 l/ha Afalon on 4 October 1995	0.50	1.29	2.66
+ 2.0 l/ha Butisan S on 4 October 1995	0.00	0.00	1.16
+ 2.0 l/ha stefes Lenacil on 2 February 1996	1.22	0.96	1.96
+ 0.75 l/ha Fortrol on 2 February 1996	0.25	2.21	2.67
No herbicide on 29 April 1996	0.25	1.75	2.01
SED (46 df)	0.422	0.758	0.686
Error mean square	0.357	1.149	0.942
P	0.05	0.05	NS

Table 74. 1996 ADAS Boxworth, Field name: Childerley - Winter linseed. Weed populations on 11 June 1996 (plants/m²)

Treatment	Chickweed (√)
As IFS, Appendix 45	1.52
2.0 l/ha Basagran and 1.0 l/ha Vindex instead of 30 g/ha Ally on 29 April 1996	2.48
40 g/ha Eagle instead of 30 g/ha Ally on 29 April 1996	3.68
No herbicide on 29 April 1996	3.39
SED (15 df)	0.670
Error mean square	0.898
P	0.05

Table 75. 1996 ADAS Boxworth, Field name: Childerley - Winter linseed. Ground cover of cleavers (√%)

Treatment	Cleavers (√)
As IFS, Appendix 45	3.01
+ 1.0 l/ha Afalon on 4 October 1995	2.67
+ 2.0 l/ha Butisan S on 4 October 1995	2.36
+ 2.0 l/ha stefes Lenacil on 2 February 1996	2.15
+ 0.75 l/ha Fortrol on 2 February 1996	3.11
2.0 l/ha Basagran and 1.0 l/ha Vindex instead of 30 g/ha Ally on 29 April 1996	2.58
40 g/ha Eagle instead of 30 g/ha Ally on 29 April 1996	0.03
No herbicide on 29 April 1996	3.17
+ 3.0 l/ha Compass on 19 June 1996	2.46
+ 1.5 l/ha Compass on 19 June 1996	1.99
+ 1.0 l/ha Folicur on 19 June 1996	2.45
+ 0.5 l/ha Folicur on 19 June 1996	2.52
SED (47 df)	0.498
Error mean square	0.415
P	0.001

Table 76. 1996 ADAS Boxworth, Field name: Childerley - Winter linseed Yield and quality

Treatment	Yield	oil	N%	GM
As IFS, Appendix 45	2.43	40.3	3.25	19.13
+ 1.0 l/ha Afalon on 4 October 1995	2.52	39.9	3.20	18.84
+ 2.0 l/ha Butisan S on 4 October 1995	2.38	40.3	3.12	17.33
+ 2.0 l/ha stefes Lenacil on 2 February 1996	2.60	40.6	3.18	17.35
+ 0.75 l/ha Fortrol on 2 February 1996	2.54	40.4	3.11	18.31
2.0 l/ha Basagran and 1.0 l/ha Vindex instead of 30 g/ha Ally	2.45	40.5	3.14	18.50
40 g/ha Eagle instead of 30 g/ha Ally on 29 April 1996	2.48	41.0	3.13	19.31
No herbicide on 29 April 1996	2.43	40.5	3.12	19.67
+ 3.0 l/ha Compass on 19 June 1996	2.57	40.0	3.06	18.86
+ 1.5 l/ha Compass on 19 June 1996	2.50	40.0	3.22	18.90
+ 1.0 l/ha Folicur on 19 June 1996	2.47	40.0	3.09	18.33
+ 0.5 l/ha Folicur on 19 June 1996	2.48	39.9	2.96	18.80
SED (46 df)	0.066	0.549	0.114	0.315
Error mean square	0.007	0.497	0.023	0.159
P	<0.05	NS	0.05	<0.05

Table 77. 1997 ADAS Boxworth, Field name: Thorofare - Winter wheat , Yield and quality

	Summary	Yield (log t/ha)	GM	SPWT	TGW	Protein	HFN	SDS
IFS	As IFS, Appendix 46	2.08	514.1	75.2	36.3	9.40	291.3	45.3
2	1.0 l ha^{-1} Starane instead of 0.65 l ha^{-1} Starane on 9.4.97	2.08	506.4	75.0	37.9	9.21	286.6	44.1
3	No spring herbicide on 9.4.97	2.09	542.0	**74.2**	36.9	9.20	290.2	44.8
4	1.0 l ha^{-1} mecoprop instead of 0.65 l ha^{-1} Starane on 9.4.97	2.05	514.5	**74.4**	37.6	**8.61**	**269.5**	42.7
5	+ 0.9 l ha^{-1} Sportak on 18.4.97	2.10	507.5	75.0	**38.9**	9.18	281.9	44.1
6	+ 87 kg ha^{-1} foliar urea on 11.7.97	2.52	**459.0**	74.7	38.0	8.82	274.2	43.1
7	+ 2.3 l ha^{-1} Stefes 700 CCC on 9.4.97	2.04	**477.9**	74.8	38.0	9.02	282.1	43.4
8	+ 130 kg ha^{-1} extra nitrogen	**2.25**	**586.5**	75.3	37.2	**10.67**	299.9	48.0
9	+ 0.5 l ha^{-1} Opus on 29.5.97	2.12	521.2	74.6	37.9	9.20	288.3	41.6
10	+ 0.5 l ha^{-1} Radar on 29.5.97	2.09	497.8	**74.4**	37.6	8.97	279.4	44.0
11	+ 0.25 l ha^{-1} tebuconazole on 4.7.97	2.09	512.9	75.2	37.8	9.50	298.6	47.3
	SED	0.031	20.50	0.37	1.09	0.256	9.40	2.07

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level

Table 78. 1997 ADAS Boxworth, Field name: Long field - Winter linseed, Yield and quality

	Summary	yield (t/ha)	GM (£/ha)	TGWT (g)	Oil (%)
IFS	As IFS, Appendix 47	1.61	124.0	5.7	37.1
2	40 g ha^{-1} Eagle instead of 30 g ha^{-1} Ally on 2.4.97	1.60	125.6	5.7	37.9
3	1.0 l ha^{-1} Basagran and 1.0 l ha^{-1} Vindex instead of 30 g ha^{-1} Ally on 2.4.97	1.62	114.3	5.5	37.3
4	No herbicide on 2.4.97	1.54	138.3	5.6	37.4
5	+ 2.30 l ha^{-1} Stefes 700CCC on 2.4.97	1.59	111.3	5.6	37.1
6	+ 0.5 l ha^{-1} Folicur on 30.5.97	1.84	134.4	5.9	36.9
7	+ 0.5 l ha^{-1} Folicur on 30.5.97 and 0.5 l ha^{-1} Folicur on 17.6.97	1.79	107.8	**6.2**	37.5
8	+ 1.0 l ha^{-1} Folicur on 30.5.97	1.82	118.4	**6.1**	37.2
9	+ 1.0 l ha^{-1} Folicur on 30.5.97 and 1.0 l ha^{-1} Folicur on 17.6.97	**1.97**	103.8	**6.3**	**38.3**
10	+ 1.5 l ha^{-1} Compass on 30.5.97	1.72	117.9	5.8	37.4
11	+ 1.5 l ha^{-1} compass on 30.5.97 and 1.5 l ha^{-1} compass on 17.6.97	**2.02**	135.5	**6.7**	38.2
	SED	0.152	19.94	0.132	0.390

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level

Table 79. 1997 ADAS Boxworth, Field name: Long field - Winter linseed cv Oliver, Disease levels an 11 July

	Summary	% foci remaining (log)	% green leaf remaining (log)
IFS	As IFS, Appendix 47	3.56	1.91
2	40 g ha^{-1} Eagle instead of 30 g ha^{-1} Ally on 2.4.97	3.44	**2.76**
3	1.0 l ha^{-1} Basagran and 1.0 l ha^{-1} Vindex instead of 30 g ha^{-1} Ally on 2.4.97	3.69	1.96
4	No herbicide on 2.4.97	3.56	2.11
5	+ 2.30 l ha^{-1} Stefes 700CCC on 2.4.97	4.19	1.81
6	+ 0.5 l ha^{-1} folicur on 30.5.97	2.99	**2.75**
7	+ 0.5 l ha^{-1} folicur on 30.5.97 and 0.5 l ha^{-1} Folicur on 17.6.97	**2.30**	**3.11**
8	+ 1.0 l ha^{-1} Folicur on 30.5.97	2.57	**3.15**
9	+ 1.0 l ha^{-1} Folicur on 30.5.97 and 1.0 l ha^{-1} Folicur on 17.6.97	**0.87**	**3.90**
10	+ 1.5 l ha^{-1} Compass on 30.5.97	3.61	1.98
11	+ 1.5 l ha^{-1} compass on 30.5.97 and 1.5 l ha^{-1} compass on 17.6.97	**-0.19**	4.26
	SED	0.60	0.316

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level

Table 80. 1997 ADAS Boxworth, Field name: Long field - Winter linseed, Weed numbers/m^2

	Summary	Venus looking glass (√)	chickweed	Total weeds
IFS	As IFS, Appendix 47	3.74	1	36.5
2	40 g ha^{-1} Eagle instead of 30 g ha^{-1} Ally on 2.4.97	**1.88**	146	38.6
3	1.0 l ha^{-1} Basagran and 1.0 l ha^{-1} Vindex instead of 30 g ha^{-1} Ally on 2.4.97	**2.00**	64	42.1
4	No herbicide on 2.4.97	3.33	993	**65.0**
	SED	0.848	0.908	11.48

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level

Table 81. 1997 ADAS Boxworth, Field name: Taylors - Winter beans, Yield and quality

	Summary	Yield (t/ha)	GM (£/ha)	Choc. spot base of plant (√%) 6 June	Ascochyta base of plant (√%) 6 June	Choc. spot top of plant (√%) 1 July
1	As IFS, Appendix 48	5.49	564.9	0.696	0.460	1.495
2	+ 0.25 l ha^{-1} Cyperkill on 4.4.97	4.60	554.1			
3	+ 1.0 l ha^{-1} Bombadier and 0.5 l ha^{-1} Headlands Addstem on 14.5.97	**5.75**	577.8	**0.147**	**0.191**	**1.127**
	SED	0.078	8.133	0.143	0.0819	0.1517

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level

Table 82. 1997 ADAS Boxworth, Field name: Extra Close - Winter wheat, yield and quality

Level	Factor		Yield (t/ha)	GM (£/ha)	SPWT (kg/hl)	TGW (g)	Protein (%)	HFN	SDS
A1	As IFS, Appendix 49		**7.60**	**375.3**	**77.61**	**32.9**	**10.91**	338	4.47
A2	- IPU and Stomp on 16.1.97		**6.34**	**314.2**	**76.97**	**31.2**	**10.61**	342	4.46
		SED	0.100	7.90	0.136	0.326	0.0493	6.07	0.008
B1	Integrated		7.02	**333.6**	**77.48**	32.24	**10.82**	337	**4.48**
B2	- HBN and Starane on 7.4.97		6.92	**355.9**	**77.10**	31.92	**10.69**	343	**4.45**
		SED	0.098	7.77	0.136	0.326	0.0493	6.07	0.008
C1	Integrated		**6.83**	339.2	77.31	**32.76**	**10.80**	339	4.47
C2	plus 2.3 l ha^{-1} Stefes 700 CCC on 8.4.97		**7.10**	350.3	77.26	**31.40**	**10.72**	341	4.46
		SED	0.102	8.03	0137	0.326	0.0499	6.17	0.008
D1	Integrated		**6.77**	341.1	77.14	32.05	**10.37**	339	**4.42**
D2	plus 115 kg ha^{-1} extra nitrogen on 18.4.97		**7.16**	348.4	77.41	32.11	**11.15**	341	**4.50**
		SED	0.100	7.90	0.136	0.321	0.0493	6.17	0.008
E1	Integrated		6.91	**362.7**	77.24	**32.34**	10.73	340	4.47
E2	plus 0.9 l/ha Sportak on 1.5.97		7.02	**326.8**	77.33	**31.82**	10.79	341	4.46
		SED	0.100	7.90	0.136	0.331	0.0493	6.07	0.008
F1	Integrated		7.02	**358.2**	77.20	31.94	**10.60**	340	4.46
F2	plus 87 kg/ha foliar urea on 4.7.97		6.92	**331.3**	77.37	32.22	**10.92**	340	4.47
		SED	0.100	7.90	0.133	0.321	0.0499	6.07	0.008
G1	Integrated		7.05	**362.5**	77.36	**32.31**	10.79	341	4.46
G2	Radar not Opus on 25.5.97		6.88	**327.0**	77.21	**31.86**	10.72	340	4.46
		SED	0.098	7.77	0.133	0.326	0.0499	6.07	0.008
H1	Integrated		7.04	**357.0**	77.42	32.26	**10.83**	336	4.47
H2	plus 0.25 l/ha tebuconazole on 1.7.97		6.90	**332.5**	77.16	31.91	**10.69**	344	4.46
		SED	0.098	7.77	0.136	0.321	0.0493	6.07	0.008

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level

Table 83. 1997 ADAS Boxworth, Field name: Childerley - Winter wheat, Yield and quality

	Summary	Yield	GM	SPWT	TGW	Protein	HFN	SDS
IFS	As IFS, Appendix 50	8.65	538.5	74.5	41.2	10.43	313.9	46.7
2	1.25 l ha^{-1} Oxytril CM only on 8.4.97	8.77	543.0	74.1	40.9	10.39	304.2	40.6
3	2.30 l ha^{-1} mecoprop only on 8.4.97	**8.88**	**561.4**	74.5	40.6	10.51	315.2	50.3
4	0.65 l ha^{-1} Starane only on 8.4.97	8.75	545.0	74.7	40.7	10.36	324.4	47.8
5	+ 2.30 l ha^{-1} holdup on 2.4.97	8.50	**516.1**	**73.6**	40.2	**10.76**	327.6	49.5
6	+ 20 kg ha^{-1} nitrogen on 18.4.97	**8.97**	550.7	74.5	40.8	**10.73**	309.9	46.7
7	+ 0.9 l ha^{-1} Sportak on 18.4.97	8.81	528.2	74.4	40.5	10.63	**331.3**	46.9
8	+ 2.0 l ha^{-1} terpal on 14.5.97	8.77	**519.1**	74.4	40.3	10.59	**332.6**	50.1
9	+ 0.5 l ha^{-1} opus on 29.5.97	8.77	524.3	74.6	40.9	10.41	318.0	48.1
10	+ 0.5 l ha^{-1} radar on 29.5.97	8.70	**519.9**	74.3	40.2	10.55	320.9	49.9
11	+ 87 kg ha^{-1} foliar urea on 11.7.97	8.81	531.2	74.6	42.0	**10.85**	322.6	50.8
	SED	0.129	10.18	0.277	0.61	0.167	8.55	2.17

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level

Table 84. 1993 ADAS High Mowthorpe, Field name: Kirby West - Winter wheat, yield, quality and gross margin

	Validation treatment	Yield (t/ha)	SPWT (kg/hl)	SDS	Grain N %	HFN	Grain protein (%)	GM (£/ha)
1	As IFS, Appendix 51	7.24	70.1	77.3	2.30	201	13.1	564
2	Weed control	6.98	69.0	75.5	2.37	193	13.5	529
3	Early fungicide	7.13	68.9	76.5	2.32	209	13.2	547
4	Flag leaf fungicide	7.13	68.7	74.0	2.34	200	13.4	547
5	Ear wash fungicide	7.67	70.1	75.3	2.24	187	12.8	600
6	3 - spray programme	7.58	70.1	73.5	2.29	200	13.1	580
7	Aphid control	7.14	68.6	71.5	2.28	208	13.0	552
	SED	0.269	0.86	2.93	0.047	9.0	0.27	
	CV%	5.2	1.8	5.5	2.9	6.4	2.9	

Table 85. 1993 ADAS High Mowthorpe, Field name: Tommy Ireland winter wheat, yields and grain quality

	treatment	Yield (t/ha)	GM (£/ha)	SPWT (kg/hl)	SDS	Grain N (%)	HFN	Grain protein (%)
1	As IFS, Appendix 52	7.16	534	72.1	76.3	2.17	153	12.4
2	Weed control	7.71	592	71.8	80.3	2.19	186	12.5
3	Nitrogen rate	6.56	471	70.7	80.7	2.27	159	12.9
4	Early fungicide	7.12	513	71.8	80.3	2.16	166	12.3
5	Flag leaf fungicide	7.01	513	71.8	78.3	2.20	146	12.5
6	Ear wash fungicide	7.48	559	72.9	81.3	2.18	158	12.4
7	3 - spray programme	7.73	562	72.5	77.0	2.14	137	12.2
8	Aphid control	7.69	586	71.9	83.0	2.14	199	12.2
	SED	0.286		0.57	4.48	0.053	23.6	0.30
	CV%	4.8		1.0	6.9	3.0	17.7	3.0

Table 86. 1993 ADAS High Mowthorpe, Field name: Warren - spring beans, yields and gross margin

	Validation treatment	Seed yield (t/ha)	Trash content (%)	GM (£/ha)
1	As IFS, Appendix 53	4.02	3.7	159
2	Herbicide	4.15	2.2	150
3	Fungicide	5.56	3.4	192
	SED	0.288	1.27	
	CV	9.6	57.9	

Table 87. 1993 ADAS High Mowthorpe, Field name: Kirby North - potatoes, yields and gross margin

	treatment	<35 mm	34-45 mm	45-55 mm	55-65 mm	>65 mm	Total yield	GM (£/ha)
1	As IFS, Appendix 54	1.33	8.56	19.89	7.54	0.88	38.20	2811
2	Herbicide	1.20	7.20	20.52	9.16	0.83	38.92	2770
	SED	0.182	4.082	2.653	1.827	0.575	1.744	
	CV%	20.3	73.3	18.6	30.9	95.7	6.4	

Table 88. 1994 ADAS High Mowthorpe, Field name: Tommy Ireland - Potatoes, yield, quality and gross margin

	Yield (t/ha) by size grade (mm)						
treatment	<35	34-45	45-55	55-65	>65	Total yield	GM (£/ha)
1. As IFS, Appendix 55	0.8	5.7	15.6	8.2	1.4	31.7	3653
2. Full Graminol	0.8	5.1	15.5	8.8	1.2	31.6	3618
3. Full Sencorex	0.9	6.4	15.3	8.2	1.7	32.5	3758
4. Mechanical weed	0.9	5.5	13.7	7.7	1.1	28.9	3219
5. Extra 20 kg/ha N	1.0	6.1	16.4	6.6	1.0	31.1	3595
6. Extra 40 kg/ha N	1.0	5.4	15.7	8.8	1.5	32.3	3736
7. Additional Shirlan	0.9	6.5	14.9	9.4	0.9	32.7	3789
F.pr.	0.910	0.443	0.328	0.200	0.621	0.222	
SED (18 d.f.)	0.16	0.72	1.07	1.00	0.45	1.45	
CV%	24.3	17.5	9.9	17.2	50.2	6.5	

Table 89. 1994 ADAS High Mowthorpe, Field name: Warren - Winter wheat, yield, quality and gross margin

Validation treatment	Yield (t/ha)	SPWT (kg/hl)	HFN	Grain N%	Grain protein (%)	Grain nitrogen offtake (kg/ha N)	**GM (£/ha)**
1. Control + extra herbicide	8.84	82.4	291	1.92	10.9	144	1170
2. Control - extra herbicide	8.90	82.4	290	1.94	11.0	146	1187
3. Growth regulator	8.76	81.5	298	1.88	10.7	140	1157
4. Additional Nitrogen	8.86	82.0	300	2.10	12.0	158	1161
5. Eyespot spray	8.56	82.4	302	1.93	11.0	140	1149
6. Extra GS39 Fungicide	8.93	82.6	283	1.92	11.0	146	1173
7. Blossom midge spray	8.78	82.4	306	1.99	11.3	148	1152
8. Foliar Urea	8.80	82.3	296	2.11	12.0	157	1150
9. Foliar N (sunburst)	8.77	82.6	306	2.00	11.4	149	1141
10. 50% Aphox	8.99	82.6	281	1.88	10.7	145	1181
11. 20% Aphox	8.90	82.3	301	1.91	10.9	144	1174
F.pr.	0.583	0.078	0.817	<0.001	<0.001	<0.001	
SED	0.176	0.33	15.9	0.039	0.23	3.8	
CV%	2.8	0.6	7.6	2.8	2.9	3.6	

Table 90. 1994 ADAS High Mowthorpe, Field name: Kirby North - Winter wheat, yield, quality and gross margin

treatment	Yield (t/ha)	SPWT (kg/hl)	HFN	Grain N%	Grain protein (%)	Grain N offtake (kg/ha N)	GM (£/ha)
1. As IFS, Appendix 57	9.00	79.0	294.5	2.13	12.1	162.5	1208
2. WBF- egg hatch spray	8.68	80.4	324.8	2.11	12.0	155.5	1143
3. WBF dead heart spray	9.15	79.7	307.8	2.18	12.4	169.1	1222
4. PGR	9.06	79.2	305.5	2.12	12.1	163.1	1214
5. Spring herbicide 1	9.10	79.0	307.3	2.19	12.5	169.4	1225
6. Spring herbicide 2	8.85	79.0	306.0	2.12	12.1	159.4	1173
7. Eyespot spray	9.40	79.7	287.3	2.14	12.2	170.2	1237
8. Extra GS 39 Fungicide	9.25	79.7	289.5	2.16	12.3	170.2	1232
9. Additional Chlorothalonil	9.14	79.7	306.8	2.11	12.0	164.1	1220
10. Blossom midge spray	9.13	79.6	315.8	2.12	12.1	164.6	1213
11. Foliar N	8.99	79.6	304.8	2.20	12.6	168.6	1188
12. Late Aphicide	9.23	79.6	302.5	2.16	12.3	169.0	1235
F.pr	0.852	0.131	0.570	0.007	0.007	0.577	
SED (33 d.f.)	0.349	0.461	15.68	0.027	0.15	7.22	
CV%	5.4	0.8	7.3	1.8	1.8	6.2	

Table 91. 1994 ADAS High Mowthorpe, Field name: Kirby South - Spring beans, yield, quality and gross margin

Validation treatment	Seed yield (t/ha)	% Trash	TGWT (g)	GM (£/ha)
1. As IFS, Appendix 58	2.26	7.1	448	444
2. Mechanical weeding	1.78	9.8	439	427
3. No weed control	2.08	8.5	463	451
F.pr.	0.144	0.197	<0.001	
SED (6 d.f.)	0.209	1.31	2.84	
CV	14.5	21.9	0.9	

Table 92. 1995 ADAS High Mowthorpe, Field name: Kirby West - spring beans, Seed Yield, Economics & Seed Quality

	Treatment	Yield t/ha	% Trash	Adjusted Yield	GM* £/ha
1	As IFS, Appendix 59	1.39	3.65	1.34	401
2	+ 3l/ha Reflex-T pre-em, - Basagran	1.77	3.06	1.72	428
3	- cypermethrin	1.21	3.11	1.17	391
4	- herbicide	1.25	3.92	1.20	418
5	+ mechanical weeder @ 4 leaf stage	1.24	4.93	1.18	419
6	1 l/ha Rover 500 + 1.1 kg/ha Benlate @ Early flower	1.58	3.38	1.52	389
	F.pr	0.002	NS	0.002	0.039
	SED	0.113	0.733	0.112	11.3
	LSD (df = 39)	0.228	1.481	0.226	22.8
	CV %	15.1	37.4	15.5	5.2

* over variable & application costs

Table 93. 1995 ADAS High Mowthorpe, Field Kirby West - Spring beans, Disease assessment 10 August 1995

		Top Third		Middle Third		Bottom Third	
		Rust (%)	Senescence (% incidence)	Rust (%)	Senescence (% incidence)	Rust (%)	Senescence (% incidence)
1	As IFS, Appendix 59	13.8	13.0	8.3	38.0	3.0	93.0
6	+ 1 l/ha Rover 500 + 1.1 kg/ha Benlate @ Early flower	17.3	9.5	9.5	17.9	2.4	47.9
	F.pr	NS	NS	NS	0.052	NS	NS
	SED	1.16	6.37	0.82	6.43	0.79	18.36
	LSD (df = 3)						
	CV %	10.6	80.0	12.9	32.5	42.0	36.9

Table 94. 1995 ADAS High Mowthorpe, Field name: Tommy Ireland - winter wheat, Grain Yield, Economics & Grain Quality

	Treatment	Yield t/ha	GM* £/ha	SPWT kg/hl	Protein %	HFN	SDS
1	As IFS, Appendix 60	6.98	980	85.0	10.7	337	74.8
2	+ 0.5l/ha Panther	7.46	1038	85.4	10.8	337	76.8
3	+ 1.5l/ha Chlorpyrifos WBF egg hatch spray	7.04	963	85.4	10.6	335	73.3
4	L.A. Life managed disease	7.06	991	85.1	10.7	332	73.8
5	+ 1.6l/ha Chlormequat	6.95	968	84.9	10.7	331	73.3
6	- Starane	7.15	1020	84.8	10.6	328	76.3
7	+ 0.5l/ha Silvacur @ GS33, + 0.75l/ha Silvacur @ GS59	7.28	1010	85.2	10.8	328	76.0
8	+ 140g/ha Aphox @ end of flowering, none @ GS75	7.38	1033	85.5	10.6	345	69.8
9	- Aphox	6.93	984	84.9	10.6	343	73.5
10	+ 140g/ha Aphox @ GS 75	7.15	998	85.3	10.8	330	74.5
11	+ 0.25l/ha Silvacur & 0.25l/ha Carbendazim @ GS 59	7.19	992	84.9	10.6	333	74.5
	F.pr	NS	NS	<0.001	NS	NS	0.004
	SED	0.162	21.85	0.104	0.111	7.50	1.199
	LSD (df = 45)	0.326	43.94	0.209	0.223	15.08	2.411
	CV %	4.1	3.9	0.2	1.9	4.0	2.9

* over variable & application costs

LA-Life - Fungicide applied when disease symptoms exceed 2% of leaf area on leaf 3 (no different to IFS Control)

Table 95. 1995 ADAS High Mowthorpe, Field name: Tommy Ireland - winter wheat, weed Assessment 5 May 1995 (Plants/m²)

	Treatment	OSR	Cleavers	Chickweed	Poppy	AMG	FGMN	RDN	Speedwell	Vol.Pots
1	As IFS, Appendix 60	3.0	0.0	6.3	84.3	10.7	0.7	2.3	22.3	0.3
2	+ 0.5l/ha Panther	3.3	0.3	3.0	70.7	8.7	0.3	1.3	13.0	0.3
	F.pr	NS	NS	NS	NS	NS	NS	NS	NS	-
	SED	1.26	0.29	2.08	15.04	3.61	0.76	0.50	3.55	-
	LSD (df = 3)	4.00	0.92	6.62	47.86	11.49	2.43	1.59	11.30	-
	CV %	56.2	244.9	63.1	27.4	52.7	216.0	38.6	28.4	-

Table 96. 1995 ADAS High Mowthorpe, Field name: Tommy Ireland - winter wheat cv. Hereward, Weed Assessment 5 August 1995 (Plants/m²)

	Treatment	OSR	Cleavers	Poppy	AMG	F.P'sley	W.oat	Vol.Pots	Couch
1	As IFS, Appendix 60	1.0	0.3	34.7	14.3	0.7	1.0	0.3	1.7
2	+ 0.5l/ha Panther	1.0	0.3	24.7	8.3	0.3	2.0	1.0	0.0
6	- herbicide, Mechanical weed only	0.7	1.3	37.3	7.3	0.0	0.3	0.3	1.0
	F.pr	NS	NS	NS	NS	NS	0.005	NS	NS
	SED	0.75	0.41	14.44	3.39	0.41	0.24	0.24	0.55
	LSD (df = 6)	1.82	1.00	35.33	8.30	1.00	0.58	0.58	1.35
	CV %	118.6	86.6	63.4	48.0	173.2	30.0	60.0	87.9

Table 97. 1995 ADAS High Mowthorpe, Field name: Tommy Ireland - winter wheat, Ear Disease Assessment

	Treatment	Sooty Mould (%)	Sooty Mould (% incidence)	Septoria (%)	Septoria (% incidence)	Fusarium (%)	Fusarium (% incidence)
1	As IFS, Appendix 60	20.54	100	7.72	77	0.10	1
4	L.A. Life managed disease	18.34	100	6.59	68	0.50	2
7	+ 0.5l/ha Silvacur @ GS33, + 0.75l/ha Silvacur @ GS59	17.43	100	4.80	55	0.39	2
8	+ 140g/ha Aphox @ end of flowering, none @ GS75	16.71	100	-	-	-	-
9	- Aphox	18.94	100	-	-	-	-
10	+ 140g/ha Aphox @ GS 75	17.70	100	-	-	-	-
11	+ 0.25l/ha Silvacur & 0.25l/ha Carbendazim @ GS 59	17.97	100	6.94	76	0.93	4
	F.pr	NS	-	NS	0.044	NS	NS
	SED	1.668	0	1.338	7.12	0.529	2.121
	LSD (df)	3.504 (18)	- (18)	3.027 (9)	16.11 (9)	1.197 (9)	4.798 (9)
	%CV	12.9	0	29.1	14.6	155.7	133.3

LA-Life - Fungicide applied when disease symptoms exceed 2% of leaf area on leaf 3 (no different to IFS Control)

Table 98. 1995 ADAS High Mowthorpe, Field name: Warren - seed potatoes, yield and quality

	Treatment	t/ha <35mm	t/ha 35-45mm	t/ha 45-55mm	t/ha 55-65mm	t/ha >65mm	Total t/ha	GM* £/ha
1	As IFS, Appendix 61	1.75	8.02	13.11	8.66	2.25	33.80	3542
2	+ 1kg/ha Sencorex pre-em	1.60	7.30	12.92	7.98	1.35	31.15	3142
3	Mech weed only	1.33	5.66	10.30	8.23	3.47	28.99	2678
	F.pr	NS	NS	NS	NS	NS	NS	NS
	SED	0.264	1.006	1.087	1.457	1.032	3.60	525.6
	LSD (df = 10)	0.588	2.241	2.422	3.246	2.299	8.021	1171.0
	% CV	26.9	22.7	14.4	28.4	72.3	18.4	26.6

* over variable & application costs

Table 99. 1995 ADAS High Mowthorpe, Field name: Warren - seed potatoes, Weed Assessment Plants/m² - 7 August 1995

Weed	As IFS, Appendix 61	+ 1kg/ha Sencorex pre-em	Mechanical weed only	F.pr	SED	LSD (df=6)	CV%
A M G	0	0	1.3	0.001	0.20	0.50	69.3
Bindweed	2.0	0.5	1.0	NS	0.78	1.91	94.8
Chickweed	0	0	3.8	NS	1.58	3.86	178.4
Cleaver	0.3	0	0.3	NS	0.31	0.76	264.6
Field Speedwell	0.3	0	1.0	NS	0.74	1.80	249.8
Forget-me-not	0	0	0.5	NS	0.24	0.58	200.0
Groundsel	0.3	0	1.5	NS	0.64	1.55	153.9
Poppy	0	0	0.3	NS	0.20	0.50	346.4
Sowthistle	0	0	0.3	NS	0.20	0.50	346.4
Vol. O S R	0	0	4.0	<0.001	0.58	1.41	61.2
Vol. Wheat	0	0	0.8	0.016	0.20	0.50	115.5
Wild Oat	0	0.3	0.5	NS	0.26	0.65	149.1

Table 100. 1995 ADAS High Mowthorpe, Field name: Warren - seed potatoes, Tuber numbers

	Treatment	no./ha <35mm	no./ha 35-45mm	no./ha 45-55mm	no./ha 55-65mm	no./ha >65mm	Total tuber no./ha
1	As IFS, Appendix 61	107760	161002	152654	58174	9327	488497
2	+ 1kg/ha Sencorex pre-em	104066	144890	139953	53050	5814	447773
3	Mech weed only	84957	109909	112879	52840	12839	373424
	F.pr	NS	0.074	NS	NS	NS	NS
	SED	17316.2	19568.2	11896.5	8563.3	4301.0	48934.9
	LSD (df = 10)	38580.5	43597.9	26505.4	19079.0	9582.6	109027.0
	CV %	28.0	22.2	14.4	25.2	75.3	17.9

Table 101. 1995 ADAS High Mowthorpe, Field name: Warren - seed potatoes, Tuber skin disease assessment going into store, November 1995

	Treatment	Common Scab % Incidence	Silver Scurf % Incidence	Black Scurf % Incidence	Skin finish score	% Green tubers	mechanical damaged % tubers
1	As IFS, Appendix 61	85.2	78.5	9.0	5.2	3.0	1.5
2	+ 1kg/ha Sencorex pre-em	83.0	73.5	9.5	5.1	2.5	5.0
3	Mech weed only	91.0	75.5	9.5	5.2	8.0	5.5
	F.pr	NS	NS	NS	NS	NS	NS
	SED	5.04	4.52	2.36	0.11	2.69	1.94
	LSD (df = 10)	11.23	10.07	5.27	0.25	5.99	4.32
	CV %	9.6	9.6	41.7	3.6	106.3	93.8

Table 102. 1995 ADAS High Mowthorpe, Field name: Warren, seed potatoes - Tuber skin disease assessment coming out of store, January 1996

	Treatment	Common Scab % Incidence	Silver Scurf % Incidence	Black Scurf % Incidence	Skin Spot % Incidence	Dry rot incidence	Pink rot incidence	General rot incidence
1	As IFS, Appendix 61	87.5	83.5	13.3	1.5	5.2	0.5	0.0
2	+ 1kg/ha Sencorex pre-em	82.0	79.5	8.0	0.0	7.0	0.0	0.5
3	Mech weed only	78.5	77.0	17.0	0.0	8.5	0.0	0.0
	F.pr	NS	NS	NS	NS	NS	NS	NS
	SED	5.82	5.60	4.17	0.89	5.64	0.43	0.29
	LSD (df = 10)	12.97	12.48	9.29	1.98	12.57	0.96	0.65
	CV %	11.3	11.3	52.9	193.2	141.7	282.8	379.5

Table 103. 1995 ADAS High Mowthorpe, Field name: Kirby South - winter wheat, Weed Assessment 11 May 1995 (Plants/m^2)

	Treatment	OSR	Cleavers	Chickweed	Sow thistle	Vol. beans
1	As IFS, Appendix 62	0.0	4.0	0.0	0.3	12.5
2	+ 0.5l/ha Panther	0.3	1.8	0.0	1.0	10.0
3	- Panther	0.0	12.5	0.5	0.5	10.5
	F.pr	NS	0.04	NS	NS	NS
	SED	0.20	3.33	0.41	0.79	1.35
	LSD (df = 6)	0.50	8.15	1.00	1.94	3.31
	CV %	346.4	77.3	346.4	191.7	17.4

Table 104. 1995 ADAS High Mowthorpe Field name: Kirby South - winter wheat, Weed Assessment 3 August 1995 (Plants/m^2)

	Treatment	Cleavers	S.thistle	Vol.beans	AMG	F.parsley	W.oat
1	As IFS, Appendix 62	0.0	0.0	0.0	0.5	0.0	0.3
2	+ 0.5l/ha Panther	1.5	0.5	0.5	0.5	0.3	0.3
3	- Panther	0.0	0.0	0.0	0.5	0.0	0.0
	F.pr	0.016	NS	NS	NS	NS	NS
	SED	0.41	0.41	0.24	0.67	0.20	0.20
	LSD (df = 6)	1.00	1.00	0.58	1.63	0.50	0.50
	CV %	115.5	346.4	200.0	188.6	346.4	173.2

Table 105. 1995 ADAS High Mowthorpe, Field name: Kirby South - winter wheat, Ear Disease Assessment 3 August 1995

	Treatment	Sooty Mould (%)	Sooty Mould (% incidence)	Septoria (%)	Septoria (% incidence)
1	As IFS, Appendix 62	18.2	100.0	1.2	26.0
4	L.A. Life managed disease, - fungicide	50.2	100.0	0.6	11.0
6	+ 0.5l/ha Silvacur @ GS33, + 0.75l/ha Silvacur @ GS59	19.4	100.0	0.9	20.0
7	+ 140g/ha Aphox @ end of flowering, none @ GS75	15.7	100.0	-	-
8	- Aphox	17.8	100.0	-	-
9	+ 140g/ha Aphox @ GS 75	19.9	100.0	-	-
10	+ 0.25l/ha Silvacur & 0.25l/ha Carbendazim @ GS 59	17.3	100.0	1.1	18.0
	F.pr	<0.001	-	NS	NS
	SED	2.96	-	0.29	4.99
	LSD (df)	6.22 (18)	-	0.65 (9)	11.29 (9)
	CV %	18.5	-	43.7	37.7

LA-Life - Fungicide applied when disease symptoms exceed 2% of leaf area on leaf 3 (no fungicide triggered)

Table 106. 1995 ADAS High Mowthorpe, Experiment 2 Field name: Kirby South - winter wheat, Grain Yield, Economics & Grain Quality

	Treatment	Yield t/ha	GM* £/ha	SPWT kg/hl	Protein %	HFN	SDS
1	As IFS, Appendix 62	8.18	1066	86.0	11.6	380	92.8
2	+ 0.5l/ha Panther	8.25	1069	85.5	11.3	372	94.3
3	- Panther	8.44	1118	86.1	11.4	375	95.5
4	L.A. Life managed disease, - fungicide	7.66	1031	85.1	11.5	401	95.0
5	+ 1.6l/ha Chlormequat	8.39	1085	86.0	11.0	380	91.3
6	+ 0.5l/ha Silvacur @ GS33, + 0.75l/ha Silvacur @ GS59	8.32	1069	86.0	11.7	374	94.3
7	+ 140g/ha Aphox @ end of flowering, none @ GS75	8.54	1114	86.3	11.0	389	93.0
8	- Aphox	8.25	1087	86.0	11.1	365	92.3
9	+ 140g/ha Aphox @ GS 75	8.43	1094	86.3	11.3	382	94.8
10	+ 0.25l/ha Silvacur & 0.25l/ha Carbendazim @ GS 59	8.33	1069	85.9	11.2	396	92.5
	F.pr	<0.001	0.003	<0.001	0.004	0.087	0.279
	SED	0.135	18.23	0.187	0.160	11.29	1.717
	LSD (df = 27)	0.277	37.41	0.384	0.328	23.17	3.523
	CV %	2.3	2.4	0.3	2.0	4.2	2.6

* over variable & application costs

LA-Life - Fungicide applied when disease symptoms exceed 2% of leaf area on leaf 3 (no fungicide triggered)

Table 107. 1996 ADAS High Mowthorpe, Field name: Kirby West - winter wheat, Yield and quality data

Treatments	Yield (t/ha)	SPWT (kg/hl)	HFN	SDS	Grain protein (%)
1. As IFS, Appendix 63	8.38	78.4	348	53.8	8.8
2. Residual/contact herbicide	8.19	78.6	342	54.5	9.0
3. Residual herbicide + IPU	8.02	78.5	354	59.5	9.3
4. PGR	8.46	77.2	349	55.0	8.8
5. Danish Support System 1	8.77	78.7	335	56.5	9.0
6. Danish Support System 2	8.45	78.2	351	60.0	9.1
7. No fungicide @ GS 31/32	8.48	78.5	341	55.0	9.0
8. L.A.LIFE managed disease	8.15	78.0	350	57.0	8.7
9. Extra Nitrogen	9.19	78.7	332	68.3	10.5
10. Additional flag leaf fungicide	8.38	78.5	344	55.5	8.9
11. Earwash spray	8.42	78.5	346	60.5	9.0
12. 20% Aphox	8.50	78.6	342	59.5	8.9
13. 50% Aphox	8.57	78.6	349	54.0	8.9
F.prob	<0.001	NS	NS	<0.001	<0.001
SE (27 d.f.) control	0.077	0.097	5.917	1.11	0.05
SE (27 d.f.) rest	0.134	0.168	10.249	1.93	0.08
CV%	3.2	0.4	5.9	6.8	1.9

Table 108. 1996 ADAS High Mowthorpe, Field name: Warren - winter Yield and grain quality

Treatment	Yield (t/ha)	SPWT (kg/hl)	HFN	SDS	Grain protein content (%)
1. As IFS, Appendix 64	6.39	77.2	311	66.7	9.12
2. non- residual autumn herbicide	9.10	77.7	310	66.5	9.27
3. Wheat bulb fly egg hatch and dead heart spray	6.65	76.4	302	62.5	8.75
4. PGR	6.28	76.2	311	62.0	8.80
5. Danish Support System 1	6.15	77.1	300	64.0	8.98
6. Danish Support System 2	6.54	76.9	310	58.0	8.83
7. Danish Support System 3 (	7.43	77.6	313	61.5	9.08
8. No mildew control at GS31/32	6.12	76.6	299	67.3	9.12
9. L.A.LIFE managed disease	5.80	76.4	302	64.5	9.02
10. Extra Nitrogen	6.88	77.2	330	66.3	9.21
11. Extra flag-leaf fungicide	5.77	76.4	308	61.5	8.73
12. late weed control	6.31	76.5	319	58.5	8.96
13. Ear wash spray	6.38	77.3	310	68.8	8.95
14. 20% Aphox	6.56	76.7	298	69.3	8.87
15. 50% Aphox	6.07	76.5	317	61.0	8.83
F.prob	<0.001	NS	NS	NS	NS
SE (42 d.f.)	1.997	2.77	13.2	3.61	0.146
CV%	60.9	7.2	8.5	11.3	3.2

Table 109. 1996 ADAS High Mowthorpe, Field name: Kirby North - Spring beans, Yields

Treatment	Yield (t/ha @ 85% DM)
1. As IFS, Appendix 65	3.00.
2. Post-emergence herbicide	2.34
3. Mechanical weed only	2.49
4. 3 followed by 2	2.45
5. Pea and bean weevil control	3.33
6. Chocolate spot fungicide programme - 1	2.93
7. Chocolate spot fungicide programme - 2	3.05
8. No silver 'Y' control	2.20
9. 50% Decis (silver 'Y' control)	2.68
10. Downy mildew spray	3.12
F.prob	<0.001
SE (27 d.f.)	0.094
CV%	6.8

Table 110. 1996 ADAS High Mowthorpe, Field name: Kirby South - Seed potatoes, Potato yield by size grade (tonnes /hectare)

Treatment	<35mm	35-45mm	45-55mm	55-65mm	>65mm	Total all grades
1. As IFS, Appendix 66	1.32	6.04	14.39	7.23	0.64	29.62
2. Alternative herbicide	1.41	7.81	14.18	4.78	0.44	28.63
3. Mech weed only	1.12	6.79	13.21	6.04	0.64	27.79
4. Mech weed + herbicide	1.42	8.25	12.57	4.45	0.48	27.17
F.prob	NS	NS	NS	0.05	NS	NS
SE (13 d.f.) control	0.124	0.648	0.771	0.579	0.227	0.759
SE (13 d.f.) rest	0.176	0.916	1.090	0.819	0.321	1.073
CV%	26.7	26.2	15.9	27.6	113.1	7.5

Table 111. 1997 ADAS High Mowthorpe, Field name: Kirby West Potato yield by size grade (tonnes /hectare)

Treatment	<35mm	35-45mm	45-55mm	55-65mm	>65mm	Total all grades	Gross margin (£/ha)
1. As IFS, Appendix 67	0.42	3.53	10.47	17.94	12.18	44.54	2106
2. Graminol	0.54ns	2.93ns	11.58ns	18.28ns	10.64ns	43.95ns	2097
3. Mech weed	0.47ns	3.28ns	11.31ns	18.45ns	12.07ns	45.57ns	2245
SED	0.100	0.395	0.726	1.323	1.865	1.174	

Table 112. 1997 ADAS High Mowthorpe, Field name: Kirby West, Post harvest disease assessment - October 1997

	Treatment			
	1. As IFS, Appendix 67	2. Graminol	3. Mech weed	SED
Skin finish score (1-9 scale, 9 = clean and bright)	5.5	5.7	5.6	-
% Green tubers	8.5	6ns	4*	1.563
% Tubers mechanically. damaged	8	6.5ns	10.5ns	3.039
% Tubers affected by silver scurf	29.0	31.0ns	41.5ns	5.603
% Tuber surface affected by silver scurf	1.405	1.465ns	1.425ns	0.416
% Tubers affected by black scurf	3.0	16*	10ns	4.8
% Tuber surface affected by black scurf	0.065	0.748ns	0.370ns	0.349
% Tubers affected by common scab	40.0	35.0ns	31.0ns	6.53
% Tuber surface affected by common scab	0.97	0.93ns	1.00ns	0.448

Table 113. 1997 ADAS High Mowthorpe, Field name: Tommy Ireland, weed assessment 14.8.97 (plants/m²)

Treatment			Poppy	Sow Thistle	Wild oat	Volunteer potato	Total
Reflex-T	No insecticide	Folio	2.0	0.0	0.0	2.6	4.8
		No fungicide	1.5	0.0	0.5	1.8	6.5
	Cyperkill 10	Folio	6.5	0.0	0.5	2.5	3.8
		No fungicide	9.4	0.2	0.2	1.2	5.2
Basagran	No insecticide	Folio	3.0	0.0	0.5	3.0	9.5
		No fungicide	2.0	0.0	0.6	2.0	11.2
	Cyperkill 10	Folio	9.0	0.4	0.6	1.2	11.2
		No fungicide	12.8	0.0	0.2	1.2	14.3
		Reflex-T	2.1	0	0.4	2.3	5.1
		Basagran	9.4*	0.2	0.4	1.5*	11.5*
		SED	0.19	skew	skew	0.21	0.16
		No insecticide	5.2	0.1	0.4	2.3	8.0
		Cyperkill	6.3ns	0.1	0.4	1.6ns	8.6ns
		SED	0.19	skew	skew	0.21	0.16
		Folio	4.9	0.1	0.3	2.0	7.4
		No fungicide	6.6ns	0.1	0.5	1.8ns	9.2ns
		SED	0.19	skew	skew	0.21	0.16

Skew - populations distorted by large number of zero figures which prevents standard statistical analysis

Table 114. 1997 ADAS High Mowthorpe, Field name: Tommy Ireland Disease assessment- 14.8.97

Treatment			Chocolate spot - % infection per plant	Chocolate spot - % of plants infected
Reflex-T	No insecticide	Folio	15.3	100
		No fungicide	12.8	100
	Cyperkill 10	Folio	16.5	100
		No fungicide	14.9	100
Basagran	No insecticide	Folio	14.6	100
		No fungicide	14.9	100
	Cyperkill 10	Folio	15.2	100
		No fungicide	13.9	100
		Reflex-T	14.5	100
		Basagran	15.1	100
		SED	skew	skew
		No insecticide	15.4	100
		Cyperkill	14.2	100
		SED	skew	skew
		Folio	14.9	100
		No fungicide	14.7	100
		SED	skew	skew

Skew - populations distorted by large number of maximum % figures or deviation from normal distribution which prevents standard statistical analysis

Table 115. 1997 ADAS High Mowthorpe, Field name: Tommy Ireland, yield and economics

Treatment			Yield (t/ha @ 85% DM)	Gross margin (£/ha)
Reflex-T	No insecticide	Folio	4.55	640
		No fungicide	4.67	687
	Cyperkill 10	Folio	4.51	628
		No fungicide	4.03	616
Basagran	No insecticide	Folio	4.63	652
		No fungicide	4.34	658
	Cyperkill 10	Folio	4.01	582
		No fungicide	4.34	651
		Reflex-T	4.42	643
		Basagran	4.32ns	636
		SED	0.083	
		No insecticide	4.41	659
		Cyperkill	4.33ns	619
		SED	0.083	
		Folio	4.54	625
		No fungicide	4.20*	653
		SED	0.083	

Table 116. 1997 ADAS High Mowthorpe, Field name: Kirby North Weed assessment 28.1.97 -

Treatment	Plants/m^2				
	As IFS, Appendix 69	2. Mech weed + herb	3. No autumn herb	4. CMPP-P in autumn	SED
Chickweed	0.00	4.75	9.25	0.00	skew
AMG	0.00	0.00	0.00	1.00	skew
Speedwell	0.00	0.25	0.00	0.00	skew
Poppy	0.25	10.75*	11.50*	6.50ns	4.236
Cleaver	8.50	10.75ns	11.50ns	4.00ns	5.718
Volunteer beans	0.75	14.00*	13.50*	0.75ns	2.614
Forget-me not	0.00	0.00	1.00	0.50	skew
Total weeds	9.50	40.50*	46.75*	12.75ns	9.571

Skew - data set contains too many zero figures which skews the data set from a normal distribution.

Table 117. 1997 ADAS High Mowthorpe, Field name: Kirby North Leaf disease levels of Septoria, 26 June 1997- Kirby North

Treatment	Septoria (% infection leaf 2)	Septoria (% leaf 2 infected)	Septoria (% infection leaf 3)	Septoria (% leaf 3 infected
1. As IFS, Appendix 69	0.98	45.0	6.90	100.0
6. LA-LIFE	1.25ns	42.5ns	7.78ns	100.0ns
7. NO GS32 fung	0.73ns	45.0ns	8.63ns	100.0ns
8. 3-spray fung prog	0.75ns	25.0ns	5.60ns	95.0ns
9. Extra fung at GS 47	0.60ns	27.5ns	6.20ns	100.0ns
10. + Ear wash spray	1.10ns	45.0ns	7.18ns	97.5ns
SED	0.447	9.69	1.75	2.96

Table 118. 1997 ADAS High Mowthorpe, Field name: Kirby North Leaf disease levels of Mildew, 26 June 1997

Treatment	Mildew (% infection leaf 2)	Mildew (% leaf 2 infected)	Mildew (% infection leaf 3)	Mildew (% leaf 3 infected
1. As IFS, Appendix 69	0.150	7.5	0.18	12.5
6. LA-LIFE	0.50ns	25.0ns	0.48ns	25.0ns
7. NO GS32 fung	0.40ns	22.5ns	0.30ns	15.0ns
8. 3-spray fung prog	0.42ns	25.0ns	0.65ns	25.0ns
9. Extra fung at GS 47	0.38ns	25.0ns	0.50ns	32.5ns
10. + Ear wash spray	0.20ns	15.0ns	0.25ns	12.5ns
SED	0.201	9.10	0.23	10.56

Table 119. 1997 ADAS High Mowthorpe, Field name: Kirby North Wheat-ear disease levels, 12 August 1997

Treatment	Septoria (% ears infected)	Sooty mould (% ears infected)	Fusarium (% infection per ear)	Fusarium (% ears infected)
1. As IFS, Appendix 69	92.5	87.5	0.15	15.0
6. LA-LIFE	92.5ns	82.5ns	0.15ns	7.5ns
7. NO GS32 fung	90.0ns	85.0ns	0.15ns	7.5ns
8. 3-spray fung prog	92.5ns	75.0ns	0.12ns	10.0ns
9. Extra fung at GS 47	95.0ns	85.0ns	0.00ns	0.0*
10. + Ear wash spray	92.5ns	80.0ns	0.18ns	12.5ns
SED	5.32	8.63	0.084	4.64

Table 120. 1997 ADAS High Mowthorpe, Field name: Kirby North Yield and grain quality

Treatments	Yield (t/ha)	Specific weight (kg/hl)	Hagberg falling number	Grain nitrogen (%)	Grain protein (%)	Gross margin (£/ha)
1. As IFS, Appendix 69	8.62	78.5	319	2.29	11.2	734
2. Mechanical weed + herb	7.83*	77.6*	309ns	2.28ns	11.2ns	687
3. No autumn herbicide	8.52*	78.2ns	329ns	2.30ns	11.3ns	740
4. Only CMPP-P in autumn	8.83ns	78.2ns	307ns	2.30ns	11.3ns	766
5. + PGR	8.66ns	77.9*	299ns	2.30ns	11.3ns	729
6. LA-LIFE	8.84ns	78.3ns	292ns	2.33ns	11.4ns	768
7. NO GS32 fung	8.67ns	78.6ns	314ns	2.32ns	11.4ns	759
8. 3-spray fung prog	8.51ns	78.7ns	328ns	2.26ns	11.1ns	700
9. Extra fung at GS 47	8.68ns	78.9ns	321ns	2.29ns	11.2ns	734
10. + Ear wash spray	8.76ns	78.5ns	302ns	2.31ns	11.3ns	731
SED	0.098	0.38	21.4	0.022	0.11	

Table 121. 1997 ADAS High Mowthorpe, Field name: Kirby South, Weed assessment 21.1.97 (/m²)

Treatment	As IFS, Appendix 70	Autumn mech weed	Weed control in spring only	SED (IFS v treatment)
Chickweed	0.75	5.00ns	6.25*	2.164
Poppy	1.00	5.75*	14.25*	0.268
Cleavers	1.50	1.25ns	8.25ns	4.72
Volunteer OSR	0.25	0.50	1.00	skew
Fumitory	0.00	2.25	3.25	skew
Groundsel	0.00	0.00	0.50	skew
Forget-me-not	0.00	0.00	0.25	skew
Total weeds	3.50	14.75*	33.75*	0.304

Skew - populations distorted by large number of zero figures which prevents standard statistical analysis

Table 122. 1997 ADAS High Mowthorpe, Field name: Kirby South, Weed assessment 16.5.97

Treatment	As IFS, Appendix 70	Plants/m² Autumn mechanical weed	Herbicide in spring only	Mechanical weed control in spring	SED
Fumitory	2.75	11.25*	8.50ns	3.75ns	2.375
Poppy	7.25	12.00ns	38.25*	8.00ns	0.408
Chickweed	0.00	17.50*	15.00*	0.75ns	0.519
Cleaver	3.00	2.25ns	10.00ns	4.25ns	1.021
AMG	0.75	2.25ns	4.50*	0.50ns	1.364
Fool's parsley	17.75	10.00ns	6.50*	23.75ns	0.247
Volunteer potato	9.25	5.50ns	5.25ns	9.50ns	2.264
Groundsel	1.50	1.50ns	0.25ns	1.75ns	0.667
Volunteer OSR	0.25	0.00	0.25	0.25	skew
Henbit dead nettle	0.00	0.00	0.00	0.25	skew
Plantain	0.25	0.00	0.00	0.00	skew
Speedwell	0.00	0.25	0.00	0.00	skew
PRG	0.00	0.25	0.00	0.00	skew
Total weeds	42.75	62.75ns	88.50*	52.75ns	12.32

Skew - populations distorted by large number of zero figures which prevents standard statistical analysis

Table 123. 1997 ADAS High Mowthorpe, Field name: Kirby South, Dead hearts caused by wheat bulb fly

Treatment	% of plants with dead-hearts
1. As IFS, Appendix 70	36.5
4. Egg hatch spray	21.0*
SED	1.50

Table 124. 1997 ADAS High Mowthorpe, Field name: Kirby South Leaf disease levels of Septoria, 26 June

Treatment	Septoria (% infection of leaf 2)	Septoria (% leaf 2 infected)	Septoria (% infection of leaf 3)†	Septoria (% leaf 3 infected
As IFS, Appendix 70	1.550	67.5	4.350	97.5
7. LA Life	3.450*	87.5*	8.775*	100.0ns
8. No GS 32	2.075ns	80.0ns	7.125*	100.0ns
9. 3-Spray	1.500ns	67.5ns	2.850ns	80.0*
10. Extra fung @ GS39	1.575ns	65.0ns	4.150ns	92.5ns
11. Ear wash	2.150ns	80.0ns	3.075ns	100.0ns
SED	0.449	8.258	-	7.341

† Data log transformed to perform statistical analysis as original data skewed from normal distribution
Skew - populations distorted by large number of zero figures which prevents standard statistical analysis

Table 125. 1997 ADAS High Mowthorpe, Field name: Kirby South Leaf disease levels of Mildew, 26 June

Treatment	Mildew (% infection of leaf 2)	Mildew (% leaf 2 infected)	Mildew (% infection of leaf 3)	Mildew (% leaf 3 infected
As IFS, Appendix 70	0.225	15.0	0.25	15.0
7. LA Life	0.475ns	27.5ns	0.50*	27.5ns
8. No GS 32	0.650ns	30.0ns	0.45ns	30.0*
9. 3-Spray	0.375ns	27.5ns	0.35ns	27.5ns
10. Extra fung @ GS39	0.150ns	15.0ns	0.40ns	15.0ns
11. Ear wash	0.400ns	27.5ns	0.25ns	27.5ns
SED	0.221	10.61	0.107	9.37

Skew - populations distorted by large number of zero figures which prevents standard statistical analysis

Table 126. 1997 ADAS High Mowthorpe, Field name: Kirby South Ear diseases 12.8.97

Treatment	Septoria (% ears infected)	Sooty mould (% ears infected)	Fusarium (% infection per ear)	Fusarium (% ears infected)
As IFS, Appendix 70	74.0	70.0	0.20	10.0
7. LA Life	77.5ns	72.5ns	0.05	5.0
8. No GS 32	73.3ns	70.0ns	0.13	6.7
9. 3-Spray	50.0ns	70.0ns	0.8	7.5
10. Extra fung @ GS39	62.5ns	77.5ns	0.05	5.0
11. Ear wash	72.5ns	80.0ns	0.18	10.0
SED	12.65	13.33	skew	skew

Skew - populations distorted by large number of zero figures which prevents standard statistical analysis

Table 127. 1997 ADAS High Mowthorpe, Field name: Kirby South, yield, quality and economics data

Treatments	Yield (t/ha)	Specific weight (kg/hl)	Hagberg falling number	Grain nitrogen (%)	Grain protein (%)	Gross margin (£/ha)
As IFS, Appendix 70	8.87	77.7	271	2.30	11.3	739
2. Aut mech weed + spr herb	8.49*	76.7*	256ns	2.34*	11.5*	732
3. Herbicide in spring only	8.31*	77.2ns	283ns	2.34*	11.5*	721
4. WBF control	8.82ns	77.8ns	284ns	2.30ns	11.3ns	711
5. PGR	8.68*	77.0*	268ns	2.30ns	11.3ns	714
6. Mech weed in spring	8.49*	76.4*	244*	2.33ns	11.4ns	724
7. LA-LIFE	7.33*	74.9*	270ns	2.36*	11.5*	637
8. No GS32 fungicide	8.72*	77.5ns	276ns	2.32ns	11.4ns	746
9. 3-Spray fung prog	9.16*	77.7ns	272ns	2.32ns	11.2ns	738
10. Extra fung at GS39	8.90ns	77.9ns	283ns	2.30ns	11.3ns	736
11. Ear wash fungicide	8.82ns	77.8ns	268ns	2.31ns	11.3ns	726
SED	0.094	0.356	13.36	0.019	0.09	

Table 128. 1993 SAC Pathhead, Field name: Corselets - Spring Oilseed Rape,Yield, Economics,Seed Quality and Agronomic Data

		Seed yield (t/ha)	Gross Margin (£/ha)	TSW (g)	Oil % @91% DM	Botrytis (%)	Powdery mildew % @GS 6,3
1	As IFS, Appendix 71	2.562	655.43	3.56	46.8	0.37	1.0
2	No Butisan	2.586	670.13	3.60	47.2	0.05	0.75
3	Full rate Butisan	2.441	615.70	3.52	47.0	0.17	0.75
4	plus 30 kg/ha Nitrogen	2.831	685.27	3.57	47.2	0.25	0.5
5	plus Sportak alpha	2.482	614.19	3.56	47.2	0.27	0.75
6	Plus thiovit	2.520	631.52	3.54	46.9	0.1	0.25
7	Plus Rovral flo	2.501	619.09	3.58	47.4	0.37	1.0
8	Plus 1/2 rate Decis	2.552	649.09	3.52	47.4	0.2	0.75
9	Plus 1/2 rate Decis	2.594	649.95	3.47	46.7	0.4	0.25
10	Plus full rate Decis	2.526	640.47	3.51	47.3	0.2	1.0
	SE	0.067	9.40	0.038			
	LS	0.135	19.03	0.077			
	CV%	3.71	2.06	1.54			
	F Pr	<0.01	-	-			

Table 129. 1993 SAC Pathhead, Field name: Richardson's Rig - winter wheat, Grain Yield,Economics & Grain Quality

		Yield (t/ha)	GM (£/ha)	TGWT (g)	SPWT (kg/hl)	Screenings (%) >3	2.5-3	2.2-2.5	<2mm
1	As IFS, Appendix 72	8.04	780.30	45.7	68.8	62.0	31.3	6.1	0.6
2	plus 30 kg/ha nitrogen	8.14	781.70	44.8	68.6	56.2	36.6	6.7	0.5
3	no gs39 fungicide	7.49	751.36	42.7	67.1	45.2	45.1	9.0	0.7
4	full rate impact excel at gs39	8.11	782.25	44.5	68.4	53.4	38.3	7.6	0.7
5	plus terpal	8.02	759.66	45.2	68.4	55.5	36.3	7.4	0.8
6	no gs 59 fungicide	7.81	768.03	44.2	68.4	60.1	34.0	5.5	0.4
7	plus maneb at gs59	7.86	769.11	44.8	68.9	54.3	37.3	7.6	0.8
8	plus septal at gs59	8.12	783.39	46.1	68.6	54.1	36.8	8.2	0.9
9	plus 1/2 rate aphox	9.05	874.04	49.2	69.9	63.4	31.6	4.5	0.5
10	conventional	8.22	773.26	46.1	68.3	55.6	34.5	8.9	1.0
	SED	0.180	17.69	0.797	0.660				
	LSD	0.364	35.81	1.613	1.336				
	CV%	3.16	3.20	2.48	1.36				
	F Pr	<0.01	-	-	-				

Table 130. 1993 SAC Pathhead, Field name: Richardson's Rig - winter wheat, Agronomic data

		Mildew (%) GS 58	S triticii (%) GS 58	Mildew (%) GS 83	S triticii (%) GS 83	GLA (%) GS 83	Straw length (cms)	loging (%) GS 83
1	As IFS, Appendix 72	0.1	3.5	0	5.0	40.0	76.5	1.2
2	plus 30 kg/ha nitrogen	3.2	6.5	2.5	12.5	50.0	80.0	1.2
3	no gs39 fungicide	0.5	6.7	1.5	27.5	32.5	74.5	0
4	full rate impact ecel at gs39	0.2	5.5	0	7.0	35.0	76.0	0.2
5	plus terpal	0.9	5.0	2.0	20.0	52.5	72.5	0
6	no gs 59 fungicide	0.3	5.2	2.5	11.0	27.5	78.0	0
7	plus maneb at gs59	0	5.7	3.5	13.5	37.5	76.0	2.0
8	plus septal at gs59	0	6.5	4.5	18.5	40.0	76.5	2.5
9	plus 1/2 rate aphox	0	4.0	2.0	8.5	45.0	76.5	0
10	conventional	1.3	8.7	1.0	10.0	35.0	82.0	3.2
	SED	0.689	1.560	2.222	3.484	7.780	1.565	1.270
	LSD	1.393	3.154	4.493	7.045	15.732	3.164	2.568

Table 131. 1993 SAC Pathhead, Fieldname: Bleakpen - Spring Barley, Agronomic Data

		Yield (t/ha)	GM (£/ha)	TGWT (g)	SPWT (kg/hl)	Screenings (%) >3	2.5-3	2.2-2.5	<2.2mm	N%
1	As IFS, Appendix 73	4.22	538.72	43.55	64.46	51.1	41.1	5.1	2.7	1.36
2	Full rate Swipe	4.07	513.83	44.65	64.03	44.8	47.8	5.3	2.1	1.47
3	1/6 rate swipe	4.04	519.15	44.22	64.27	50.0	43.7	4.0	2.3	1.41
4	No manganese spray	4.29	550.46	44.40	64.46	46.1	46.9	4.6	2.4	1.38
5	plus 30 kg/ha N	4.70	587.47	44.52	64.48	40.0	50.0	6.7	3.3	1.50
6	plus 30 kg/ha N + Terpal	4.82	589.53	43.47	64.10	45.6	46.9	4.6	2.9	1.36
7	plus 1/4 rate Tilt	4.00	503.64	44.30	65.22	40.0	52.1	5.6	2.3	1.36
8	plus 1/2 rate Tilt	4.31	536.33	44.65	64.73	47.8	45.6	4.8	1.8	1.42
9	plus tilt turbo	4.31	526.19	44.05	64.40	44.4	48.0	5.4	2.2	1.42
10	plus 1/2 rate Aphox	4.26	537.15	45.65	65.16	55.2	39.5	3.1	2.2	1.44
	SED	0.188	22.66	0.663	0.404					
	LSD	0.380	45.87	1.342	0.817					
	CV%	6.20	5.93	2.11	0.88					
	F Pr	<0.01	<0.01	0.131	0.08					

Table 132. 1994 SAC Pathhead, Field name: Under Langlands - Spring Barley, Grain Yield, economics & Grain Quality

		Yield (t/ha)	GM (£/ha)	TGWT (g)	SPWT (kg/hl)	Screenings (%) >3mm	0.2-3	2-2.5	<2.2	n (%)
A	As IFS, Appendix 74	6.090	949.00	45.4	69.4	51.0	42.8	4.2	2.0	1.74
B	No herbicide	5.897	927.10	45.4	69.3	52.1	42.0	3.8	2.1	1.74
C	Full rate herbicide	5.949	917.70	45.0	69.6	52.1	43.2	3.0	1.7	1.61
D	No manganese	5.924	927.40	45.0	69.6	56.6	38.6	3.4	1.4	1.73
E	Plus 30 kg/ha N	6.605	1014.20	45.3	69.7	52.2	41.5	4.1	2.2	1.75
F	Plus 30 kg/ha N + Terpal	6.570	996.20	43.7	69.4	44.7	48.1	4.8	2.4	1.78
G	Plus 1/2 rate Punch C	5.879	908.90	46.3	69.5	52.2	42.5	3.1	2.2	1.61
H	Plus full rate Punch C	6.231	949.30	45.8	69.4	56.1	39.0	2.8	2.1	1.72
J	Plus 1/2 rate Aphox	5.937	920.70	45.6	69.4	57.1	38.8	2.2	1.9	1.70
		0.140	20.05	0.551	0.196					
		0.282	40.52	1.113	0.396					
		3.24	3.00	1.72	0.40					
		<0.01	<0.01	<0.01	0.54					

Table 133. 1994 SAC Pathhead, Field name: Under Langlands - Spring Barley, Agronomic data

		Rhynco sporium (%) GS 80	GLA (%)	Straw length (cm)	Necking (%) GS 91	Brackling (%) GS 91
A	As IFS, Appendix 74	0	42.5	61.5	30.0	2.0
B	no herbicide	1	37.5	61.0	17.5	2.0
C	full rate herbicide	0	40.0	61.5	20.0	1.5
D	no manganese	1	45.0	61.5	20.0	1.0
E	plus 30 kg/ha N	1.5	45.0	62.5	25.0	5.0
F	plus 30 kg/ha N + terpal	0.5	55.0	61.5	7.5	3.0
G	plus 1/2 rate punch c	0	35.0	61.5	10.0	0.5
H	plus full rate punch c	0	42.5	62.0	15.0	2.5
J	plus 1/2 rate aphox	0.5	42.5	64.0	25.0	5.0
	SED	0.874	3.535	2.889	7.660	1.161
	LSD	1.766	7.145	5.839	15.482	2.346

Table 134. 1994 SAC Pathhead, Field name: Bleakpen - Spring oilseed rape, Grain Yield, economics & Grain Quality

		Yield (t/ha)	GM (£/ha)	TSWT (g)	Oil (%)	Glucs	Straw length (cm)
1	As IFS, Appendix 75	2.09	691.43	4.04	44.7	10.8	102.5
2	no butisan S	2.14	716.75	4.07	44.5	-	102.5
3	full rate Butisan S	2.16	686.80	4.05	44.6	-	107.5
4	plus 30 kg/ha nitrogen	2.14	692.12	4.00	44.3	11.3	102.5
5	plus Thiovit	2.26	702.58	4.02	44.1	12.5	105.0
6	plus sportak alpha	2.27	691.89	3.89	44.6	-	105.0
7	plus Rovral Flo	2.19	680.86	4.05	44.7	-	110.0
8	plus half rate decis	2.20	700.41	4.02	42.0	-	105.0
	SED	0.078	13.58	0.065			7.007
	LSD	0.159	27.79	0.133		-	
	CV%	5.08	2.76	2.29		-	
	F Pr	0.31	0.29	0.20		-	

Table 135. 1994 SAC Pathhead, Field name: Bleakpen - Spring oilseed rape, weed populations (plants/m²)

		Knot-grass	Ivy lf speedwell	Fumitory	Chickweed	Mayweed	Shepherds purse
1	As IFS, Appendix 75	17.9	11.2	1.9	0	0	0
2	no butisan S	29.3	4.6	3.3	0.6	0	0
3	full rate Butisan S	22.6	7.3	3.3	0.3	0.3	0
4	plus 30 kg/ha nitrogen	28.6	4.3	5.3	1.3	0.3	0
5	plus Thiovit	17.6	6.6	2.6	0.3	0	0
6	plus sportak alpha	25.2	4.6	2.6	0	0	0
7	plus Rovral Flo	16.3	7.3	2.6	0.3	0	0.6
8	plus half rate decis	18.2	8.3	1.0	1.3	0	0
	SED	7.437	3.116	2.039	0.663	-	
	LSD	15.221	6.377	4.173	1.357	-	

Table 136. 1994 SAC Pathhead, Field name: Cottage - Winter wheat, Grain Yield,Economics & Grain Quality

		Yield (t/ha)	GM (£/ha)	TGWT (g)	SPWT (kg/hl)	Screenings (%) >3	2.5-3	2-2.5	<2mm
A	As IFS, Appendix 76	9.15	987.00	55.4	70.3	78.1	18.7	3.0	0.2
B	plus 30 kg/ha n	9.92	1056.40	55.7	72.1	73.5	21.9	4.3	0.3
C	plus pgr	8.88	956.70	53.6	70.0	72.3	22.7	4.5	0.5
D	plus 1/2 rate cmpp	9.18	985.50	55.3	70.5	77.1	19.8	2.6	0.5
E	plus 1/3 rate sportak delta gs 31	9.05	965.50	57.1	70.6	76.6	20.0	3.2	0.2
F	no gs 39 fungicide	8.97	982.30	54.9	70.1	74.9	20.8	3.4	0.9
G	plus full rate gs39 fungicide	9.03	960.90	56.6	70.2	79.6	17.6	2.4	0.4
H	plus half rate gs 59 fungicide	9.29	987.60	56.8	70.3	78.5	18.5	2.1	0.9
J	plus full rate gs 59 fungicide	9.27	971.50	55.7	70.6	78.7	18.6	2.5	0.2
K	plus terpal	8.92	943.80	51.8	69.7	69.2	24.4	5.5	0.9
L	plus 1/2 rate aphox	9.11	977.20	57.6	70.4	82.1	15.3	2.0	0.6
M	conventional	9.48	978.00	52.4	70.2	67.3	26.4	5.5	0.8
	SED	0.190	19.79	0.887	0.455				
	LSD	0.384	40.02	1.793	0.920				
	CV%	2.93	2.85	2.27	0.91				
	F Pr	<0.01	<0.01	<0.01	<0.01				

Table 137. 1994 SAC Pathhead, Field name: Cottage - Winter wheat, Agronomic data

		Septoria triticii (%) GS 39	Septoria triticii (%) GS 75	mildew (%) GS 75	GLA (%) GS 75	Straw length (cm)	Sooty mould (%) GS87
A	As IFS, Appendix 77	5.2	4.0	2.5	65.0	85.0	7.5
B	plus 30 kg/ha n	3.5	6.0	2.0	72.5	85.5	7.5
C	plus pgr	4.5	4.0	0.5	67.5	77.5	12.0
D	plus 1/2 rate cmpp	2.7	3.0	0	67.5	82.0	9.5
E	plus 1/3 rate sportak delta gs 31	2.5	5.0	0.5	70.0	84.0	8.5
F	no gs 39 fungicide	4.5	13.5	1.5	57.5	85.5	11.0
G	plus full rate gs39 fungicide	5.0	2.5	1.0	65.0	85.0	10.0
H	plus half rate gs 59 fungicide	4.5	2.5	0	70.0	84.0	7.0
J	plus full rate gs 59 fungicide	3.5	2.5	0	67.5	83.0	6.0
K	plus terpal	5.0	5.0	1.0	55.0	76.5	12.0
L	plus 1/2 rate aphox	4.5	7.0	0.5	62.5	85.0	10.0
M	conventional	4.0	15.0	1.5	65.0	78.0	7.0
	SED	1.434	2.128	0.896	5.400	1.255	2.738
	LSD	2.900	4.303	1.812	10.920	2.538	5.537

Table 138. 1995 SAC Pathhead, Field name: Richardson's Rig - winter wheat, Grain Yield, Economics & Grain Quality

	Treatment	Yield t/ha	GM* £/ha	TGW g	SPWT kg/hl	Screenings(%) >3	2.5-3	2-2.5	<2 mm
1	As IFS, Appendix 78	10.25	1191	53.1	71.9	79.0	18.1	2.6	0.3
2	No herbicide	9.75	1155	53.6	71.2	79.9	17.8	2.0	0.3
3	+ 40 kg/ha N	11.20	1283	53.7	72.2	80.6	16.8	2.2	0.4
4	No GS 31 fungicide	10.90	1277	54.2	72.6	81.5	16.3	1.8	0.4
5	Full dose GS 31 fungicide	10.44	1190	53.6	71.6	77.2	20.5	2.0	0.3
6	No GS 39 fungicide	10.27	1205	52.4	71.5	81.3	16.6	1.8	0.3
7	Full dose GS 39 fungicide	10.77	1221	54.1	71.9	80.8	16.6	2.3	0.3
8	+ 1/3 dose GS 59 fung.	10.56	1216	53.5	72.0	77.2	20.1	2.4	0.3
9	+ Full dose GS 59 fung.	10.74	1215	53.6	71.7	80.7	16.6	2.3	0.4
10	+ 'Terpal'	10.55	1204	52.6	71.7	80.1	17.3	2.1	0.5
11	+ 1/2 dose 'Aphox'	10.32	1194	54.1	71.5	81.1	16.9	1.7	0.3
12	Autumn herbicide #	10.97	1269	54.3	72.3	80.7	16.7	2.3	0.3
	F.pr	<0.01	<0.01	NS	NS				
	SED	0.268	29.52	0.768	0.599				
	LSD (df = 33)	0.542	59.76	1.553	1.212				
	CV %	3.59	3.43	2.03	1.17				

= 1/2 dose 'Autumn Kite'+1/2 dose 'Panther'
· over variable & application costs

Table 139. 1995 SAC Pathhead, Fieldname: Richardson's Rig - winter wheat, Agronomic Data

	Treatment	Mildew (%) @ GS 45	Septoria tritici(%) @ GS 45	Green leaf area(%)	Straw length (cms)	Septoria tritici(%) @ GS 77
1	As IFS, Appendix 78	0	2.0	7.5	79.0	2.5
2	No herbicide	0	1.5	10.0	81.0	3.0
3	+ 40kg/ha N	0	1.5	42.5	82.0	11.0
4	No GS 31 fungicide	1.5	5.0	11.0	82.5	4.0
5	Full dose GS 31 fungicide	0	1.0	21.0	79.0	5.0
6	No GS 39 fungicide	0	2.0	22.5	80.5	5.0
7	Full dose GS 39 fungicide	0	2.0	8.5	79.5	2.5
8	+ 1/3 dose GS 59 fung.	0	1.5	17.5	78.5	2.5
9	+ Full dose GS 59 fung.	0	3.5	12.5	79.5	3.0
10	+ 'Terpal'	0	2.0	7.5	75.0	3.0
11	+ 1/2 dose 'Aphox'	0	4.0	17.5	80.0	3.0
12	Autumn herbicide *	0	2.5	22.5	81.5	7.5
	F.pr		NS	0.02	NS	0.01
	SED		1.259	7.616	1.846	1.770
	LSD (df = 11)		2.546	15.40	3.733	3.579
	CV %		8.59	45.58	2.31	40.86

Table 140. 1995 SAC Pathhead, Field name: Under Langlands - Spring oilseed rape, Seed Yield, Economics & Seed Quality

	Treatment	Seed Yield t/ha	GM* £/ha	TSW g	Oil (%)	Glucosinolate Content umoles/g	Haulm Length cms
1	As IFS, Appendix 79	2.34	773	3.81	45.9	13.8	135
2	No herbicide	2.25	768	3.86	46.0	-	135
3	Full dose 'Butisan S'	2.14	717	3.83	46.2	-	142.5
4	+ 30 kg/ha N	2.15	731	3.83	45.7	13.6	137.5
5	+ 20 kg/ha S	2.36	758	3.80	48.5	12.5	142.5
6	+ Full dose 'Sportak Alpha'	2.30	737	3.83	46.2	-	135
7	+ Full dose 'Rovral WP'	2.26	732	3.80	46.5	-	140
8	No 'Decis'	2.27	764	3.93	46.3	-	135
	F.pr	NS	NS				
	SED	0.171	27.98	0.049			
	LSD (df = 21)	0.350	57.03	0.099			
	CV %	10.74	5.29	1.83			

* over variable & application costs

Table 141. 1995 SAC Pathhead, Field name: Upper Langlands, winter wheat, Grain Yield, Economics & Grain Quality

	Treatment	Yield t/ha	GM* £/ha	TGW g	SPWT kg/hl	Screenings(%) >3	2.5-3	2-2.5	<2mm
1	As IFS, Appendix 80	10.68	1229	53.5	66.8	86.3	12.0	1.2	0.5
2	No herbicide	10.34	1204	51.6	66.6	83.4	14.0	1.8	0.8
3	+ 40 kg/ha N	10.82	1231	52.4	67.2	87.1	11.8	0.8	0.3
4	No GS 31 fungicide	10.55	1235	51.7	66.8	84.5	13.8	1.4	0.3
5	Full dose GS 31 fungicide	10.80	1223	52.9	66.7	84.2	14.0	1.4	0.4
6	No GS 39 fungicide	10.38	1212	50.7	65.8	81.2	16.4	2.1	0.3
7	Full dose GS 39 fungicide	10.79	1208	52.4	66.7	83.0	14.6	1.9	0.5
8	+ 1/3 dose GS 59 fung.	10.59	1209	51.3	66.2	84.6	13.3	1.5	0.6
9	+ Full dose GS 59 fung.	10.63	1194	51.1	66.7	85.4	12.4	1.7	0.5
10	+ 'Terpal'	10.61	1201	51.3	66.1	81.5	15.9	2.0	0.6
11	+ 1/2 dose 'Aphox'	10.33	1185	52.4	66.9	85.9	12.2	1.4	0.5
12	Autumn herbicide #	10.80	1234	51.4	67.4	84.8	13.0	1.9	0.3
	F.pr	0.10	NS	0.02	0.11				
	SED	0.192	21.14	0.716	0.480				
	LSD (df = 33)	0.388	42.79	1.447	0.972				
	CV %	2.56	2.46	1.95	1.01				

= 1/2 dose 'Autumn Kite'+1/2 dose 'Panther'

* over variable & application costs

Table 142. 1995 SAC Pathhead, Fieldname: Upper Langlands - winter wheat, Agronomic Data

	Treatment	Mildew (%) @ GS 45	Septoria tritici(%) @ GS 45	Green leaf area(%)	Straw length (cms)	Septoria tritici(%) @ GS 77
1	As IFS, Appendix 80	0	0.8	50.0	81.0	4.0
2	No herbicide	0	1.0	57.5	81.0	3.0
3	+ 40kg/ha N	0	1.5	72.5	80.5	2.0
4	No GS 31 fungicide	1.5	4.0	52.5	86.0	3.0
5	Full dose GS 31 fungicide	0	0.8	47.5	82.5	2.5
6	No GS 39 fungicide	0	0.8	57.5	81.0	4.5
7	Full dose GS 39 fungicide	0.3	1.5	45.0	81.0	2.0
8	+ 1/3 dose GS 59 fung.	0	1.0	52.5	81.0	1.0
9	+ Full dose GS 59 fung.	0.3	2.0	45.0	81.5	2.5
10	+ 'Terpal'	0	1.0	60.0	80.0	3.0
11	+ 1/2 dose 'Aphox	0.6	2.5	65.0	80.5	2.5
12	Autumn herbicide *	0	1.5	50.0	81.5	3.0
	F.pr	0.01	<0.01	NS	NS	NS
	SED	0.302	0.629	9.474	1.717	1.037
	LSD (df = 11)	0.610	1.272	19.16	3.472	2.097
	CV %	-	41.41	17.35	2.10	37.72

Table 143. 1995 SAC Pathhead, Cottage - spring barley, Grain Yield, Economics & Grain Quality

	Treatment	Yield t/ha	GM* £/ha	TGW g	SPWT kg/hl	Screenings (%) >3	2.5-3	2.2-2.5	<2.2mm	N%
1	As IFS, Appendix 81	5.50	1007	48.2	72.9	46.9	50.3	1.9	0.9	1.38
2	No 'Harmony M'	5.54	1020	47.8	73.0	43.7	53.3	2.2	0.8	1.42
3	Full dose 'Harmony M'	5.64	1018	48.4	72.7	45.7	51.7	1.9	0.7	1.40
4	No manganese	5.37	991	48.1	73.3	43.0	53.0	2.7	1.3	1.44
5	+ 30 kg/ha N	6.04	1086	47.6	73.1	44.2	52.7	2.1	1.0	1.43
6	+ 30 kg/ha N + 'Terpal'	6.42	1136	48.6	72.7	44.8	51.8	2.3	1.1	1.51
7	+ Half dose 'Punch C'	5.49	996	48.5	72.7	48.9	47.7	2.3	1.1	1.38
8	+ Full dose 'Punch C'	5.81	1037	49.3	73.0	48.2	49.3	1.9	0.6	1.38
9	+ Half dose 'Aphox'	5.77	1047	48.1	72.9	41.7	55.8	1.7	0.8	1.25
	F.pr	<0.01	<0.01	0.07	0.12					
	SED	0.197	32.13	0.495	0.209					
	LSD (df = 24)	0.399	65.17	1.002	0.424					
	CV %	4.84	4.38	1.44	0.405					

* over variable & application costs

Table 144. 1995 SAC Pathhead, Fieldname: Cottage - Spring Barley, Agronomic Data

	Treatment	Rhyncho. (%) @ GS 80	BYDV (%) @ GS 49	Green leaf area(%) @ GS 80	Straw length (cms)
1	As IFS, Appendix 81	0.3	0.1	4.0	77.5
2	No 'Harmony M'	1.0	0.5	0.5	77.5
3	Full dose 'Harmony M'	0.5	0.3	3.0	77.5
4	No manganese	0	0.3	0	75.5
5	+ 30kg/ha N	0.6	0.3	3.0	77.5
6	+ 30kg/ha N + 'Terpal'	2.5	0.1	4.0	74.5
7	+ Half dose 'Punch C'	0.3	0.1	0	77.0
8	+ Full dose 'Punch C'	0.1	0.3	2.5	80.0
9	+ Half dose 'Aphox'	0	0.3	0	78.5
	F.pr	0.05	NS	NS	NS
	SED	0.606	0.223	1.559	4.084
	LSD (df = 8)	1.227	0.451	3.157	8.271
	CV %	-	93.69	82.53	5.28

Table 145. 1996 SAC Pathhead, Field name: Corselets - winter wheat, Yield and quality data

	Treatment Validation	Yield (t/ha)	GM (£/ha)	TGWT (g)	SPWT (g)	Screenings (%) >3	2.5-3	2-2.5	<2mm
1	As IFS, Appendix 82	10.58	1083.49	49.2	76.7	59.3	33.5	6.3	0.9
2	Autumn herbicide*	10.74	1105.45	48.9	76.6	55.9	36.4	7.3	0.4
3	No herbicide	10.74	1124.40	49.8	76.7	58.6	34.5	6.2	0.7
4	+ 40kg/ha N	10.82	1096.01	48.3	76.5	46.3	42.9	9.7	1.1
5	No GSZ 31 fungicide	10.46	1099.14	49.1	76.5	57.6	34.7	7.0	0.7
6	Full dose GSZ 31 fungicide	10.56	1061.43	49.8	76.6	56.1	36.8	6.5	0.6
7	No GSZ 39 fungicide	10.20	1064.47	47.9	76.3	55.4	36.9	7.1	0.6
8	Full dose GSZ 39 fungicide	10.73	1068.66	49.7	76.2	52.6	38.2	8.4	0.8
9	+ 1/3 dose GSZ 59 fung.	10.39	1046.89	48.9	77.0	55.7	37.5	6.1	0.7
10	+ Full dose GSZ 59 fung.	10.73	1063.64	48.9	76.6	52.3	39.9	7.4	0.4
11	+ 'Terpal'	10.55	1056.18	48.1	76.6	57.0	36.7	5.6	0.7
12	+ 1/2 dose 'Aphox'	10.81	1096.55	52.0	77.1	63.0	30.9	5.5	0.6
	SED	0.158	18.62	0.738	0.247				
	LSD	0.319	37.69	1.494	0.500				
	CV%	2.33	2.43	2.12	4.56				
	F.Pr	0.04	<0.01	<0.01	0.08				

* = 1l/ha 'Panther' with no follow up spring applied herbicide

Table 146. 1996 SAC Pathhead, Field name: Richardson's Rig - spring barley, Design: Fractional factorial

Level	Factor	Yield (t/ha)	GM (£/ha)	TGW (g)	SPWT (kg/hl)	Screenings(%) >3	2.5-3	2.2-2.5	<2.2mm	N%
A1 (Integrated)	Herbicide	6.763	1101.32	44.18	68.54	67.0	31.3	1.2	0.5	1.47
A2 (Full dose)	Herbicide	6.835	1102.12	44.54	68.62	50.7	47.2	1.5	0.6	1.66
	SED	0.074		0.251	0.146					
	LSD	0.154		0.522	0.303					
B1 (Integrated)	Manganese	6.768	1102.07	44.33	68.75	67.0	31.3	1.2	0.5	1.47
B2 (None)	Manganese	6.829	1112.77	44.39	68.41	64.1	33.9	1.3	0.7	1.58
	SED	0.074		0.245	0.150					
	LSD	0.154		0.509	0.312					
C1 (Integrated)	Nitrogen	6.612	1078.67	44.63	68.61	67.0	31.3	1.2	0.5	1.47
C2 (+30kg/haN)	Nitrogen	6.893	1110.82	44.20	68.80	45.9	51.9	1.5	0.7	1.92
C3 (+30kg/haN+PGR)	Nitrogen	6.891	1098.64	44.25	68.34	28.5	68.0	3.0	0.5	1.95
	SED	0.090		0.305	0.180					
	LSD	0.187		0.634	0.374					
D1 (Integrated)	Fungicide	6.767	1101.92	44.52	68.52	67.0	31.3	1.2	0.5	1.47
D2 (None)	Fungicide	6.748	1116.24	44.38	68.67	51.2	46.5	1.7	0.6	1.71
D3 (Full dose)	Fungicide	6.882	1108.25	44.18	68.56	45.9	51.0	2.3	0.8	1.71
	SED	0.088		0.305	0.178					
	LSD	0.183		0.634	0.370					
E1 (Integrated)	Insecticide	6.719	1094.72	43.74	68.46	67.0	31.3	1.2	0.5	1.47
E2 (Half dose)	Insecticide	6.879	1106.95	44.98	68.70	60.2	37.7	1.6	0.5	1.78
	SED	0.073		0.251	0.144					
	LSD	0.152		0.522	0.299					

Table 147. 1996 SAC Pathhead, Field name: Under Langlands - winter wheat, Yield and quality data

	Treatment	Yield (t/ha)	GM (£/ha)	TGW (g)	SPWT (kg/hl)	Screenings(%) >3	2.5-3	2-2.5	<2mm
1	As IFS, Appendix 84	10.04	1041.38	49.4	72.4	69.5	24.6	5.4	0.5
2	Autumn herbicide*	10.45	1090.34	49.4	72.8	67.0	26.4	6.0	0.6
3	No herbicide	9.81	1054.57	49.0	71.9	68.2	25.8	5.5	0.5
4	+ 40kg/ha N	10.76	1105.74	48.5	73.4	69.4	25.1	5.0	0.5
5	No GSZ 31 fungicide	9.86	1050.55	49.3	72.4	67.3	27.1	5.1	0.5
6	Full dose GSZ 31 fungicide	10.00	1017.16	49.6	72.5	68.7	24.4	6.2	0.7
7	No GSZ 39 fungicide	9.89	1047.20	50.1	72.1	66.9	26.2	6.1	0.8
8	Full dose GSZ 39 fungicide	10.15	1022.23	50.2	72.6	67.3	27.0	5.3	0.5
9	+ 1/3 dose GSZ 59 fung.	9.94	1014.50	50.1	72.4	67.9	26.3	5.3	0.4
10	+ Full dose GSZ 59 fung.	10.24	1026.93	49.2	72.4	69.1	25.8	4.8	0.3
11	+ 'Terpal'	10.02	1015.15	49.0	72.8	66.5	26.6	6.3	0.6
12	+ 1/2 dose 'Aphox'	10.23	1050.12	50.2	72.1	71.5	23.5	4.5	0.5
	SED	0.121	15.12	0.826	0.292				
	LSD	0.244	30.61	1.672	0.591				
	CV%	1.85	2.04	2.36	5.71				
	F.Pr	<0.01	<0.01	0.65	<0.01				

* = 1l/ha 'Panther' with a follow up spring application of 0.6l/ha 'Starane2'

Table 148. 1996 SAC Pathhead, Field name: Cottage - spring oilseed rape, agronomic data

	Treatment Validation	Haulm Length (cms)	AMG no/m2	Fat hen no/m2	Chickweed no/m2
1	As IFS, Appendix 85	127.5	0.5	1.0	0.3
2	No herbicide	130.0	685.7	4.7	0.7
3	Full dose 'Butisan S'	137.5	0	0.7	0
4	+ 30kg/ha N	142.5	0	0	0
5	+ 20kg/ha S	135.0	0	0.7	0
6	+ Full dose 'Sportak Alpha'	147.5	0	0	0
7	+ Full dose 'Rovral Flo'	137.5	0	0	0
8	No 'Decis'	130.0	0	0	0

Table 149. 1996 SAC Pathhead, Field name: Cottage - spring oilseed rape, yield and quality

	Treatment Validation	Seed Yield (t/ha) @91%DM	Gross Margin (£/ha)	TSW (g)	Oil (%)	Glucosinolate Content (umoles/g)
1	As IFS, Appendix 85	3.215	923.43	4.38	44.2	16.2
2	No herbicide	3.201	939.79	4.50	44.7	-
3	Full dose 'Butisan S'	3.181	891.43	4.37	43.8	-
4	+ 30kg/ha N	3.426	953.52	4.44	43.4	16.2
5	+ 20kg/ha S	3.081	878.97	4.41	44.7	15.1
6	+ Full dose 'Sportak Alpha'	3.124	870.29	4.55	44.6	-
7	+ Full dose 'Rovral Flo'	3.334	910.59	4.43	44.7	-
8	No 'Decis'	3.366	956.42	4.49	44.6	-
	SED	0.142	29.47	0.072	9.700	
	LSD	0.287	59.53	0.146	19.59	
	CV%	6.88	4.54	2.30	7.18	
	F.Pr	0.37	0.06	0.21	0.42	

Table 150. 1997 SAC Pathhead, Field name: Corselets - Spring Barley, yield and quality

Level	Factor	Yield (t/ha)	GM (£/ha)	TGW (g)	SPWT (kg/hl)	n%
A1(As IFS, Appendix 86)	Herbicide	5.93	627.42	45.9	68.1	1.40
A2 (Full dose)	Herbicide	5.89	616.68	45.5	68.1	1.43
	SED	0.076		0.206	0.111	
	LSD	0.157		0.427	0.230	
B1(integrated)	Manganese	5.90	624.96	45.6	68.0	-
B2(None)	Manganese	5.91	628.23	45.8	68.2	-
	SED	0.077		0.206	0.133	
	LSD	0.159		0.427	0.276	
C1(integrated)	Nitrogen	5.57	594.84	46.0	68.0	1.40
C2 (+30 kg/ha N)	Nitrogen	6.10	632.01	45.7	68.2	1.41
C3 (+30 kg/ha N+PGR)	Nitrogen	6.05	609.72	45.3	68.0	1.52
	SED	0.093		0.254	0.137	
	LSD	0.193		0.528	0.284	
D1(integrated)	Fungicide	6.00	633.97	45.4	67.9	1.40
D2 (None0	Fungicide	5.71	624.39	45.7	68.1	1.56
D3(full dose)	Fungicide	6.01	623.92	46.0	68.1	1.54
	SED	0.093		0.254	0.133	
	LSD	0.193		0.528	0.276	
E1(integrated)	Insecticide	5.82	617.92	45.6	68.1	1.40
E2 (Half dose)	Insecticide	6.00	622.65	45.8	68.0	1.48
	SED	0.08		0.206	0.108	
	LSD	0.166		0.427	0.227	

Table 151. 1997 SAC Pathhead, Field name: Corselets - Spring barley, Agronomic data

Level	Factor		Screenings (%)				Rhynchosporium (%)		straw length cm
			>3	2.5-3	2.2-2.5	<2.2	GS 57	GS77	
A1(As IFS, Appendix 86)	Herbicide		62.2	34.3	2.6	0.9	0.4	3.4	72.8
A2(full dose)	Herbicide		50.4	45.3	3.2	1.1	1.0	5.4	72.0
		SED							0.535
		LSD							1.110
B1(integrated)	Manganese		62.2	34.3	2.6	0.9	0.5	4.2	72.2
B2(none)	Manganese		53.7	42.3	3.6	0.4	0.9	4.6	72.5
		SED	47.2	48.0	3.6	1.2			0.543
		LSD							1.127
C1(integrated)	Nitrogen		62.2	34.3	2.6	0.9	0.5	0.5	71.5
C2(+30kg/ha N)	Nitrogen		53.7	42.3	3.6	0.4	0.5	1.9	74.4
C3(+30kg/ha N + PGR)	Nitrogen		47.2	48.0	3.6	1.2	1.2	6.1	71.2
		SED							0.656
		LSD							1.364
D1(integrated)	Fungicide		62.2	34.3	2.6	0.9	0.8	0.8	72.8
D2(none)	Fungicide		51.1	44.2	3.5	1.2	0.9	0.9	72.0
D3(Full dose)	Fungicide		58.0	38.6	2.4	1.0	0.4	0.4	72.2
		SED							0.656
		LSD							1.364
E1(integrated)	Insecticide		62.2	34.3	2.6	0.9	0.8	3.9	72.4
E2(half dose)	Insecticide		44.5	50.5	3.6	1.4	0.7	4.9	72.4
		SED							0.563
		LSD							1.168

Table 152. 1997 SAC Pathhead, Field name: Richardson's Rig - Spring Oilseed rape, yield and quality

Level	Factor	Yield (t/ha)	GM (£/ha)	TGW (g)	Oil (%)
A1(As IFS, Appendix 87)	Herbicide	2.21	674.53	4.45	42.7
A2 (No herbicide)	Herbicide	2.09	674.90	4.42	42.7
A3 (Full dose)	Herbicide	2.24	654.22	4.50	41.8
	SED	0.064		0.036	
	LSD	0.133		0.074	
B1(integrated)	Nitrogen	2.11	658.89	4.45	42.7
B2 (+30 kg/ha N)	Nitrogen	2.25	667.79	4.46	42.4
	SED	0.052		0.029	
	LSD	0.107		0.060	
C1(integrated)	Fungicide	2.19	672.00	4.45	42.7
C2 (full dose stem ext)	Fungicide	2.15	629.67	4.51	43.0
C3 (full dose petal fall)	Fungicide	2.19	636.74	4.40	43.0
	SED	0.064		0.036	
	LSD	0.133		0.074	
D1(integrated)	Insecticide	2.15	665.84	4.49	42.7
D2 (No insecticide)	Insecticide	2.20	684.70	4.42	43.5
	SED	0.052		0.029	
	LSD	0.107		0.060	

Table 153. 1997 SAC Pathhead, Field name: Richardson's Rig - Spring Oilseed rape , Weed data (/m²)

Level	Factor	Knotgrass	Chickwweed	Field pansy	Ivy leaf speedwell	Fumitory
A1(As IFS, Appendix 87)	Herbicide	4.5	10.5	18.8	7.5	3.5
A2 (No herbicide)	Herbicide	9.2	13.8	33.0	9.8	0.5
A3 (Full dose)	Herbicide	3.3	3.8	17.8	4.7	0.8
	SED	3.26	3.49	15.84	3.61	1.83
	LSD	6.78	7.26	32.94	7.51	3.81

Table 154. 1997 SAC Pathhead, Field name: Bleakpen - winter wheat, Yield and quality

	Treatment	Yield (t/ha)	GM (£/ha)	TGW (g)	SPWT (kg/hl)
1	As IFS, Appendix 88	9.37	813.49	45.5	67.4
2	Plus Panther 1.0 l/ha and Astix 0.5 l/ha in autumn, no spring herbicide	9.54	830.59	45.7	67.7
3	No Herbicide	9.25	825.01	45.7	67.2
4	+40 kg/ha n	9.19	781.82	45.6	67.2
5	No GS 31 Fungicide	8.89	790.24	45.3	67.7
6	Full dose GS31 Fungicide	9.58	819.29	47.7	67.6
7	No GS39 Fungicide	9.05	808.17	42.4	67.1
8	Full dose GS 39 Fungicide	9.55	802.61	46.5	67.8
9	No GS 59 fungicide	9.39	830.79	45.3	68.0
10	Full dose GS 59 Fungicide	9.35	793.85	45.3	67.7
11	+ Terpal	9.59	810.92	43.9	66.8
12	+ half dose Aphox	9.27	793.73	45.0	67.9
	SED	0.226	20.70	0.959	0.541
	LSD	0.457	41.92	1.942	1.095
	CV%	3.43	3.62	2.98	1.13
	F prob	0.09	0.35	<0.01	0.62

Table 155. 1997 SAC Pathhead Experiment 2, Field: Bleakpen - Winter wheat, Disease and lodging

	Treatment	Fusarium on ears (%) GS 78	Septoria triticii (%) GS 78	GLA (%) GS 78	Crop height (cm)	Leaning % GS 78	Lodging % GS 78
1	As IFS, Appendix 88	6.6	8.4	79.4	85.7	3.2	1.1
2	+ 1.0 l/ha Panther and 0.5 l/ha Astix	5.5	6.2	80.0	84.0	2.2	1.2
3	No herbicide	6.5	5.2	82.5	88.5	0.5	0
4	+ 40 kg/ha N	6.0	9.2	80.0	86.0	11.2	4.2
5	No GS 31 fungicide	6.5	8.5	78.7	86.5	17.5	2.5
6	Full dose GS 31 fungicide	6.0	7.5	81.2	83.5	4.0	0
7	No GS 39 fungicide	7.2	14.2	70.0	83.5	4.5	2.5
8	Full dose GS 39 fungicide	6.7	5.0	86.2	85.5	3.0	0.7
9	No GS 59 fung.	6.7	7.2	87.5	86.5	5.7	0
10	+ Full dose GS 59 fung.	5.5	4.5	87.5	85.5	3.0	0
11	+ 'Terpal'	6.0	7.7	81.2	82.0	1.0	0
12	+ 1/2 dose 'Aphox'	6.5	7.2	80.0	86.0	2.5	0
	SED	1.149	2.060	3.780	1.137	2.716	1.471
	LSD	2.326	4.170	7.652	2.301	5.498	2.978
	CV%	25.60	38.06	6.59	1.33	-	-
	F.Pr.	0.95	<0.01	<0.01	<0.01	<0.01	0.11

Table 156. 1997 SAC Pathhead Experiment 2, Field: Bleakpen - Winter wheat, weed numbers

	Treatment	Annual meadow grass	Ivy leaf speedwell	Vol. OSR	Chickweed	Fumitory	Knotgrass
1	As IFS, Appendix 88	4.0	0	0	0	1.9	1.7
2	+ 1.0 l/ha Panther and 0.5 l/ha Astix	0	0.5	0	0	7.8	11.2
3	No herbicide	8.2	1.5	7.8	7.8	23.0	57.8

NB: Figures in bold are significantly different from the Integrated treatment at the 5% level

Table 157. 1997 SAC Pathhead Experiment 2, Field: Cottage - Winter wheat, yield, economics and quality

	Treatment	Yield (t/ha)	GM (£/ha)	TGW (g)	SPWT (kg/hl)
1	As IFS, Appendix 89	7.96	727.04	55.1	65.2
2	Plus Panther 1.0 l/ha and Astix 0.5 l/ha in autumn, no spring herbicide	7.87	717.30	54.7	65.9
3	No Herbicide	8.82	734.07	55.2	65.9
4	+40 kg/ha N	9.20	733.21	54.6	65.7
5	Half dose GS 31 Fungicide	8.11	727.28	54.9	66.3
6	Full dose GS31 Fungicide	8.11	713.04	55.8	66.7
7	No GS39 Fungicide	7.35	709.38	51.5	64.7
8	Full dose GS 39 Fungicide	7.96	708.25	56.2	65.3
9	No GS 59 fungicide	7.70	718.37	55.6	65.2
10	Full dose GS 59 Fungicide	7.74	681.62	54.4	64.9
11	+ Terpal	7.76	685.42	54.5	65.1
12	+ half dose Aphox	7.91	710.46	54.6	65.1
	SED	0.154	14.13	0.846	0.632
	LSD	0.311	28.62	1.713	1.279
	CV%	2.78	2.79	2.18	1.36
	F prob	<0.01	0.01	<0.01	0.08

Table 158. 1997 SAC Pathhead, Field: Cottage - Winter wheat, Disease and lodging

	Treatment	Fusarium on ears (%) GS 78	Septoria triticii (%) GS 78	GLA (%) GS 78	Crop height (cm)
1	As IFS, Appendix 89	9.8	9.2	78.1	84.5
2	+ 1.0 l/ha Panther and 0.5 l/ha Astix	10.5	11.0	76.2	85.0
3	No herbicide	10.0	6.7	82.5	85.0
4	+ 40 kg/ha N	13.0	9.7	83.7	86.0
5	Half dose GS 31 fungicide	10.5	8.0	78.7	85.5
6	Full dose GS 31 fungicide	11.2	9.0	77.5	84.0
7	No GS 39 fungicide	13.0	31.2	55.0	84.0
8	Full dose GS 39 fungicide	11.0	6.0	78.7	84.0
9	No GS 59 fung.	10.5	10.5	75.0	85.5
10	+ Full dose GS 59 fung.	9.0	8.0	82.5	84.0
11	+ 'Terpal'	11.2	12.2	71.2	79.5
12	+ 1/2 dose 'Aphox'	10.5	8.5	77.5	84.5
	SED	0.867	1.675	0.726	0.895
	LSD	1.755	3.391	1.469	1.811
	CV%	18.67	36.15	5.86	1.06
	F.Pr.	0.22	<0.01	<0.01	<0.01

PART III

Appendix 1.

Appendix 1. 1993 ADAS Rosemaund, Field: Barnfield - Winter wheat

Integrated crop details

Crop:	Winter wheat		
Cultivar:	Soissons		
Sowing date:	16 Oct 92		
Seed rate:	157 kg/ha		
Seed dressing:	Cerevax		
Fertiliser:	14 Oct 92	250 kg/ha	0:24:24
	17 Feb 93	131.4 kg/ha	Nitram (45 kg/ha N)
	23 Mar 93	125 kg/ha	Urea (57.5 kg/ha N)
	14 Apr 93	100 kg/ha	Urea (46 kg/ha N)
	2 July 93	65.2 kg/ha	Foliar urea (30 kg/ha N)
Mechanical weeder:	12 March 1993 & 11 May 1993		
Herbicide:	15 April 93	0.5 l/ha	Starane 2
Fungicides:	29 May 93	0.75 l/ha Folicur	
	18 June 93	5 l/ha Multi-W	
Insecticides:	None		
PGR:	15 Apr 93	2.5 l/ha	Cycocel 5C
Harvest:	18 August 1993		

Appendix 2. 1993 ADAS Rosemaund, Field: Cottage - Winter wheat

Integrated crop details

Crop:	Winter wheat		
Cultivar:	Soissons		
Sowing date:	29 October 1992		
Seed rate:	157 kg/ha		
Seed dressing:	Cerevax		
Fertiliser:	17 Feb 93	131.4 kg/ha	Nitram (45kg/ha N)
	28 Feb 93	3.25 t/ha	Ground limestone
	23 Mar 93	125 kg/ha	Urea (57.5kg/ha N)
	12 Apr 93	100 kg/ha	Urea (46kg/ha N)
	2 July 93	65.2 kg/ha	Foliar urea (30 kg/ha)
Herbicide:	16 Feb 93	2.5l/ha	Javelin Gold
Fungicides:	1 June 93	0.5l/ha	Folicur
	18 June 93	5.0l/ha	Muli-W
Insecticides:	16 Feb 93	0.2l/ha	Cyperkill
PGR:	15 April 93	2.5l/ha	Cycocel 5C
Harvest:	18 August 1993		

Appendix 3. 1993 ADAS Rosemaund, Field: Bullocks Pasture - Spring beans

Integrated crop details

Crop:	Spring beans	
Cultivar:	Alfred	
Sowing date:	3 March 1993	
Seed rate:	200kg/ha	
Seed dressing:	None	
Fertiliser:	None	
Herbicide:	None	
Fungicides:	28 June 93	2.0l/ha Bravo & 0.5l/ha Benlate
Insecticides:	None	
PGR:	None	
Harvest:	27 September 1993	

Appendix 4. 1993 ADAS Rosemaund, Field: Block 1- Spring beans

Integrated crop details

Crop:	Spring beans		
Cultivar:	Alfred		
Sowing date:	5 March 93		
Seed rate:	200kg/ha		
Seed dressing:	None		
Fertiliser:	None		
Herbicide:	None		
Fungicides:	28 June 93	2.0l/ha	Bravo & 0.5l/ha Benlate
Insecticides:	None		
PGR:	None		
Harvest:	27 September 1993		

Appendix 5. 1993 ADAS Rosemaund, Field: Northfield - Potatoes

Integrated crop details

Crop:	Potatoes		
Cultivar:	Estima		
Sowing date:	26 April 1993		
Seed rate:	2.38t/ha		
Seed dressing:	Monceren		
Fertiliser:	17 April 93	1.25t/ha	19:8:18
Mechanical weeder:	2 June 1993		
Herbicide:	None		
Fungicides:	13 June 93	2.5kg/ha	Trustan
	27 June 93	2.5kg/ha	Trustan
	7 July 93	1.7kg/ha	Dithane DF
	16 July 93	2kg/ha	Curzate M
	27 July 93	0.5l/ha	Supertin
	5 Aug 93	0.5l/ha	Supertin
	13 Aug 93	1.7kg/ha	Dithane DF
	23 Aug 93	1.7kg/ha	Dithane DF & 0.25l/ha Supertin
	5 Sept 93	0.25l/ha	Supertin
Insecticides:	None		
PGR:	None		
Dessicant:	15 Oct 93	Sulphuric Acid	
Harvest: 21 October 1993			

Appendix 6. 1994 ADAS Rosemaund, Field: Barnfield - potatoes

Integrated crop details

Crop:	Potatoes	
Cultivar:	Estima	
Sowing date:	4 May 94	
Seed rate:	2.89 t/ha	
Seed dressing:	Monceren and Rizolex	
Fertiliser:	01 Apr 94	1.5 t/ha 15:10:26
Mechanical weeder:	11 June 1994 & 28 June 1994	
Herbicide:	30 July 94	Weed wiped using glyphosate
Fungicides:	26 Jun 94	2.5kg/ha Trustan
	11 Jul 94	2.5kg/ha Trustan
	25 Jul 94	300ml/ha Shirlan
	04 Aug 94	300ml/ha Shirlan
	16 Aug 94	300ml/ha Shirlan
	26 Aug 94	300ml/ha Shirlan
	05 Sept 94	300ml/ha Shirlan
	13 Sept 94	0.25 l/ha Supertin
Mechanical de-haulmer:	22 September 1994	
Harvest:	12 October 1994	

Appendix 7. 1994 ADAS Rosemaund, Field: Bullocks Pasture - winter wheat

Integrated crop details

Crop:	Winter wheat		
Cultivar:	Soissons		
Sowing date:	19 October 1993		
Seed rate:	185 kg/ha		
Seed dressing:	Cerevax		
Fertiliser:	20 Sept 93	250 kg/ha	0:24:24
	11 Mar 94	87 kg/ha	Urea (40kg/ha N)
	15 Apr 94	348 kg/ha	Urea (160kg/ha N)
	30 Jun 94	40 kg N/ha	as Foliar Urea
Herbicide:	16 Apr 94	1.0l/ha	Duplosan
	8 Aug 94	2.0l/ha	Barclay Gallup + 0.5%Ethokem (21% field only)
Mechanical weeder:	27 April 1994		
Fungicides:	18 May 94	0.5l/ha	Tilt
Insecticides:	None		
PGR:	16 Apr 94	1.75l/ha	Meteor
Harvest:	15 August 1994		

Appendix 8. 1994 ADAS Rosemaund, Field: Block 1 - Winter wheat

Integrated crop details

Crop:	Winter wheat		
Cultivar:	Soissons		
Sowing date:	19 October 1993		
Seed rate:	185 kg/ha		
Seed dressing:	Cerevax		
Fertiliser:	20 Sept 93	250 kg/ha	0:24:24
	11 Mar 94	87 kg/ha	Urea (40kg/ha N)
	15 Apr 94	391 kg/ha	Urea (180kg/ha N)
	30 Jun 94	40 kg N/ha as Foliar Urea	
Herbicide:	16 Apr 94	1.0l/ha	Duplosan
	8 Aug 94	2.0l/ha	Barclay Gallup + 0.5%Ethokem (32% of the field only)
Mechanical weeder:	27 April 1994		
Fungicides:	18 May 94	0.5l/ha	Tilt
Insecticides:	None		
PGR:	16 Apr 94	1.75l/ha	Meteor
Harvest:	15 August 1994		

Appendix 9. 1994 ADAS Rosemaund, Field: Northfield - Winter wheat

Integrated crop details

Crop	Winter wheat		
Cultivar:	Soissons		
Sowing date:	1 November 1993		
Seed rate:	185 kg/ha		
Seed dressing:	Cerevax		
Fertiliser:	11 Mar 94	87kg/ha Urea	(40kg N/ha)
	15 Apr 94	283kg/ha Urea	(130kg N/ha)
	01 Jul 94	40kg N/ha as foliar urea	
Mechanical weeder:	9 May 1994 and 17 May 1994		
Herbicide:	07 Jun 94	15g/ha Ally + 0.5l/ha Starane 2	
Fungicides:	18 May 94	0.5l/ha Tilt	
Insecticides:	None		
Plant growth regulators:	16 Apr 94	1.75l/ha	Meteor
Harvest:	14 August 1994		

Appendix 10. 1994 ADAS Rosemaund, Field: Holly-Grove - Spring beans

Integrated crop details

Crop:	Spring beans		
Cultivar:	Victor		
Sowing date:	23 March 1994		
Seed rate:	225 kg/ha		
Seed dressing:	Thiram		
Fertiliser:	12 Aug 93	3.75 t/ha	Ground limestone
	12 Aug 93	250 kg/ha	0:24:24
Herbicide:	None		
Fungicides:	None		
Insecticides:	None		
PGR:	None		
Harvest:	None		

Appendix 11. 1995 ADAS Rosemaund, Field: Barnfield - winter wheat

Integrated Crop details

Crop	1st Winter Wheat		
Cultivar:	Soissons		
Cultivations:	Disced, Shakerate headlands only, Plough, Power harrow x 2, Power harrow/drill combination		
Sowing date:	19 October 1994		
Seed rate:	177 kg/ha		
Seed dressing:	Cerevax		
Fertiliser:	Urea	87kg/ha (40kg N/ha)	23 Mar 95
	Urea	174kg/ha (80kg N/ha)	1 May 95
	Urea	87kg/ha (40kg N/ha)	5 May 95
	Foliar urea	40kg N/ha	7 July 95
Einboch weeder:	15 April 1995		
Herbicide:	Ally	10g/ha	
	+ Starane	0.3l/ha	28 Apr 95
Fungicides:	Opus	0.4l/ha	15 May 95
Insecticides:	None		
PGR:	Chlormequat 70%	1.65l/ha	6 Apr 95
Harvest:	3 August 1995		

Appendix 12. 1995 ADAS Rosemaund, Field:Bullocks Pasture - potatoes

Integrated Crop details

Crop	Potatoes		
Cultivar	Estima		
Cultivations:	Shakerator, Plough 14", rolled, heavy disc and press, power harrow, ridge form, bed tiller x 2, de-stone, plant and ridge.		
Sowing date:	16 April 1995		
Seed rate:	2.50 t/ha		
Seed dressing:	Monceren		
Fertiliser:	12:15:20	1.83 t/ha	12 Apr 95
Mechanical weeder:	None		
Herbicide:	Roundup 360	3.0 l/ha	30 Mar 95
	Sencorex	1.0 kg/ha	
	+ PDQ	2.0 l/ha	2 Jun 95
Fungicides:	Trustan	2.5 kg/ha	19 Jun 95
	Shirlan	300ml/ha	4 Jul 95
	Shirlan	300ml/ha	13 Jul 95
	Shirlan	300ml/ha	27 Jul 95
	Shirlan	300ml/ha	11 Aug 95
	Shirlan	300ml/ha	25 Aug 95
	Shirlan	300ml/ha	8 Sept 95
Mechanical de-haulmer:	18 September 1995		
Harvest:	8 October 1995		

Appendix 13. 1995 ADAS Rosemaund, Field: Cottage - spring beans

Integrated Crop details

Crop	Spring Beans		
Cultivar:	Victor		
Cultivations:	Disc/press 4", power harrow/drill combination, cambridge roll		
Sowing date:	1 April 1995		
Seed rate:	300 kg/ha		
Seed dressing:	None		
Fertiliser:	0:24:24	250 kg/ha	30 Mar 95
Herbicide:	Roundup Biactive	3.0 l/ha	13 Mar 95
Fungicides:	None		
Desiccant:	None		
Harvest:	19 August 1995		

Appendix 14. 1995 ADAS Rosemaund, Field: Holly Grove - winter wheat

Integrated Crop details

Crop	1st Winter Wheat		
Cultivar:	Soissons		
Cultivations:	Disced, Plough, Power harrow, Power harrow/drill combination		
Sowing date:	17 October 1994		
Seed rate:	177 kg/ha		
Seed dressing:	Cerevax		
Fertiliser:	0:25:25 250 kg/ha		15 Mar 95
	Urea	87kg/ha (40kg N/ha)	23 Mar 95
	Urea	239kg/ha (110kg N/ha)	1 May 95
	Urea	87kg/ha (40kg N/ha)	5 May 95
	Foliar urea	40kg N/ha	7 July 95
Einboch weeder:	15 April 1995		
Herbicide:	Duplosan	1.0l/ha	29 Nov 94
	Starane 0.3l/ha	5 May 95	
Fungicides:	Opus	0.4l/ha	15 May 95
Insecticides:	None		
PGR:	Chlormequat 70%	1.65l/ha	6 Apr 95
Harvest:	3 August 1995		

Appendix 15. 1996 ADAS Rosemaund, Field: Cottage - winter wheat

Integrated crop details

Crop:	Winter Wheat	
Cultivar:	Soissons	
Cultivations	Disced + Press, Ploughed, Power Harrow, Combination Drill	
Sowing date:	9 Oct 95	
Seed rate:	151.5 kg/ha	
Seed dressing:	Sibutol	
Fertiliser:	20 Sept 95	238kg/ha 0:24:24
	30 Mar 96	30 kg N / ha
	21 Apr 96	125 kg N / ha
	14 Jul 96	F. Urea 32 kgN/ha
Herbicide:	9 Nov 95	1.0 l/ha Panther
Fungicides	5 Jun 96	0.4 l/ha Opus
PGR:	25 Apr 96	1.65 l/ha 70% Chloromequat
Harvest:	21 Aug 96	

Appendix 16. 1996 ADAS Rosemaund, Field: Block 1 - Winter wheat

Integrated crop details

Crop:	Winter wheat
Cultivar:	Soissons
Cultivations:	Shakerator, Ploughed, Power Harrow, Combination Drill
Sowing date:	10 Oct 95
Seed rate:	151.5 kg/ha
Seed dressing:	Sibutol
Fertiliser:	30 Mar 96 40 kg N/ha as urea Block 1 only
	21 Apr 96 85/130kg N / ha
	13/14 Jul 96 32 kg N / ha as Foliar Urea
Herbicide:	25 Apr 96 10g/ha Ally + 0.3 l/ha Starane
Fungicides:	5 Jun 96 0.4 l/ha Opus
PGR:	25 Apr 96 1.65 l/ha 70% Chloromequat
Harvest:	4 Sep 96

Appendix 17. 1996 ADAS Rosemaund, Field: Northfield - Spring beans

Integrated crop details

Crop:	Spring beans
Cultivations:	Subsoiled, Disced twice , PH x Comb'n Drill, Cambridge Roll
Cultivar:	Victor
Sowing date:	5 April 96
Seed rate:	278 kg/ha
Seed dressing:	None
Fertiliser:	None
Herbicide:	6 Mar 96 1.0 l/ha Roundup Biactive
Fungicides:	None
Molluscicides:	None
Insecticides:	None
Desiccant:	None
Harvest:	13 September 96

Appendix 18. 1996 ADAS Rosemaund,. Field: Holly Grove - Potatoes

Integrated crop details

Crop	Potatoes
Cultivar:	Estima
Cultivations's:	Subsoiled, Disced X 2, Ploughed, Disced X 2, Skuffle, Power Harrow X 2, Bedform X 1, Bed tiller X 2, De-stone, Planted and Ridged
Sowing Date:	13 May 96
Seed Rate:	2.66 t/ha
Seed Dressing:	Monceren liquid dressing
Fertiliser:	14 May 96 Liquid at planting 2500 l/ha 9 : 9 : 12 = 225 kg N /ha : 225 kg P /ha : 300 kg K /ha
Herbicide:	6 Mar 96 1.0 l/ha Roundup Bioactive
Mechanically weeder:	13 Jun 96
Weed Wiped:	Roundup Bioactive (both directions)
Fungicide:	14 Jul 96 2.5 kg/ha Trustan
	29 Jul 96 300 ml/ha Shirlan
	12 Aug 96 300 ml/ha Shirlan
	28 Aug 96 300 ml/ha Shirlan
	11 Sep 96 300 ml/ha Shirlan
	21 Sep 96 300 ml/ha Shirlan
Mechanical de-haulmer	1 Oct 96
Harvest:	21 Oct 96

Appendix 19. 1997 ADAS Rosemaund, Field: Barnfield - Spring beans

Integrated crop details

Crop:	Spring beans
Cultivar:	Victor
Cultivations:	Shallow plough, Rotovate, Power harrow(top 1/2 of field only), Combination drill, Cambridge roll
Sowing date:	27 March 1997
Seed rate:	289 kg/ha
Seed dressing:	None
Fertiliser:	0:20:30 370kg/ha 24 Mar 97
Herbicide:	Roundup Biactive 1.5l/ha 14 Mar 97
	Basagran 2.0l/ha 4 Jun 97
Fungicides:	None
Molluscicides:	None
Harvest:	11 September 1997

Appendix 20. 1997 ADAS Rosemaund, Field: Cottage - Potatoes

Integrated crop details

Crop:	Winter Wheat
Cultivations:	Ploughed, Cambridge roll, Ridged, Bed tiller x 2, De-stone, Plant and ridge
Cultivar:	Estima
Sowing date:	9 April 1997
Seed rate:	3 t/ha
Seed dressing:	Monceren
Fertiliser:	9:9:12 liquid 2000l/ha 9 Apr 97
Herbicide:	Challenge 3.0l/ha 17 May 97
Fungicides:	Trustan 2.0kg/ha 17 Jun 97
	Shirlan 300ml/ha 7 Jul 97
	Shirlan 300ml/ha 21 Jul 97
	Shirlan 300ml/ha 5 Aug 97
	Shirlan 300ml/ha 18 Aug 97
	MSS Flotin 0.56l/ha 28 Aug 97
Insecticides:	Mocap 56kg/ha 9 Apr 97
Molluscicides:	None
Topping:	1 October 1997 (fat hen)
Desiccant:	Sulphuric Acid 30 Aug 97
	Sulphuric Acid 8 Sept 97
Harvest:	3 October 1997

Appendix 21. 1997 ADAS Rosemaund, Field: Block 1 - winter oats

Integrated crop details

Crop:	Winter Oats
Cultivar:	Gerald
Cultivations	Ploughed, Power Harrow, Cambridge roll, Combination drill
Sowing date:	23 September 1996
Seed rate:	118 kg/ha
Seed dressing:	Anchor
Fertiliser:	40kg N/ha as urea 15 Apr 97
	60kg N/ha as urea 15 May 97
Herbicide:	Ally 15g/ha 18 Apr 97
Fungicides	None
PGR:	70% chlormequat 1.65l/ha 15 May 96
Harvest:	20 August 1997

Appendix 22. 1997 ADAS Rosemaund, Field: Northfield - Winter wheat

Integrated crop details

Crop:	Winter Wheat
Cultivar:	Soissons
Cultivations	Ploughed, Power harrow, Combi-drilled
Sowing date:	22 October 1996
Seed rate:	160.5 kg/ha
Seed dressing:	Sibutol/Gammasan 30
Fertiliser:	Urea 40kg N/ha 2 Apr 97
	Urea 160kg N/ha 22 Apr 97
Mechanical weeder:	None
Herbicide:	IPU 1.0l/ha 3 Feb 97
	Ally 20g/ha +Starane 0.5.l/ha 21 Apr 97
Fungicides	Opus 0.4l/ha 15 May 97
Insecticide	None
Molluscicide:	None
PGR:	70% Chlormequat 1.65l/ha 10 Apr 97
Harvest:	Int 1 9 September 1997 Int 2 10 September 1997

Appendix 23. 1997 ADAS Rosemaund, Field: Holly Grove - Winter wheat

Integrated crop details

Crop:	Winter Wheat
Cultivar:	Soissons
Cultivations	Disced, Ploughed, Power Harrow, Combination drill
Sowing date:	23 October 1996
Seed rate:	160.5 kg/ha
Seed dressing:	Sibutol/Gammasan 30
Fertiliser:	40kg N/ha as urea 2 Apr 97
	120kg N/ha as urea 22 Apr 97
Herbicide:	IPU 1.0l/ha 3 Feb 97
	Starane 0.3l/ha + Ally 10g/ha 21 Apr 97
Fungicides	Opus 0.4l/ha 15 May 97
Insecticide	None
Molluscicide:	None
PGR:	70% Chlormequat 1.65l/ha 10 Apr 97
Harvest:	8 September 1997

Appendix 24. 1993 ADAS Boxworth, Field: Thorofare - Linseed

Integrated crop details

Crop	Linseed
Soil series	Hanslope
Cultivations	Vaderstad, harrow, drill, weeder, roll
Cultivar	Antares
Sowing date	25 March 1993
Seed rate	53 kg/ha
Fertiliser	3 August 1993 228 kg/ha P_2O_5
	23 April 1993 80 kg/ha N
Herbicide	18 May 1993 Ally 22.5 g/ha
PGR	None
Fungicide	None
Insecticide	None
Desiccant	7 Sept. 1993 Reglone 3.0 l/ha
	Vassgro spreader 0.2 l/ha
Harvest date	19 October 1993

Appendix 25. 1993 ADAS Boxworth, Field: Long field - Winter wheat

Integrated crop details

Crop	Winter wheat	
Cultivar	Hereward	
Cultivations	Opico x 2, Maschio, drill, harrow	
Sowing date	7 October 1992	
Seed rate	199 kg/ha	
Fertiliser	9 March 1993 205 kg/ha P_2O_5	
	7 April 1993 92 kg/ha N	
	1 May 63 kg/ha N	
Herbicide	13 April 1993	Astix 1.5 l/ha
		Oxytril CM 1.0 l/ha
PGR	8 April 1993	Stand-up 1.6 l/ha
Fungicide	13 May 1993	Radar 0.37 l/ha
	3 June 1993	Radar 0.25 l/ha
	23 June 1993	Radar 0.25 l/ha
Insecticide	None	
Harvest date	19 August 1993	

Appendix 26. 1993 ADAS Boxworth, Field: Taylors - Winter wheat

Integrated crop details

Crop	Winter wheat	
Cultivar	Soissons	
Cultivations	Plough, Dynadrive, Maschio, drill, harrow	
Sowing date	15 October 1992	
Seed rate	185 kg/ha	
Seed dressing	Rappor	
Fertiliser	17 March 1993 41 kg/ha N	
	13 April 1993 73 kg/ha N	
	29 April 1993 68 kg/ha N	
Herbicide	13 April 1993	Astix 1.0 l/ha
		Ally 30 g/ha
PGR	30 April 1993	Terpal 1.5 l/ha
Fungicide	30 April 1993	Sportak 1.0 l/ha
	13 May 1993	Radar 0.37 l/ha
	4 June 1993	Radar 0.25 l/ha
		Pencozeb 2.0 kg/ha
Insecticide	None	
Harvest date	10 August 1993	

Appendix 27. 1993 ADAS Boxworth, Field: Extra Close - Winter wheat

Integrated crop details		
Crop	Winter wheat	
Cultivar	Cadenza	
Cultivations	Opico x 2, Maschio x 2, drill, harrow	
Sowing date	9 November 1992	
Seed rate	167 kg/ha	
Seed dressing	Rappor	
Fertiliser	6 Sept. 1992 213 kg/ha P_2O_5	
	11 March 1993 42 kg/ha N	
	13 April 1993 50 kg/ha N	
	1 May 1993 93 kg/ha N	
Herbicide	19 October 1992	Sting 4.0 l/ha
	30 April 1993	Starane 0.5 l/ha
		Oxytril CM 1.0 l/ha
PGR	None	
Fungicide	18 May 1993	Radar 0.25 l/ha
	4 June 1993	Radar 0.25 l/ha
	23 June 1993	Radar 0.25 l/ha
Insecticide	None	
Harvest date	20 August 1993	

Appendix 28. 1994 ADAS Boxworth, Field: Thorofare - Winter wheat

Integrated crop details		
Crop	1st Winter Wheat	
Cultivations	Headland: plough, Maschio, drill, Maschio	
	Field: Rau rotosem	
Cultivar	Soissons	
Sowing date	Field: 9 November 1993, Headland: 24 November 1994	
Seedrate	175 kg/ha	
Fertiliser	7 March 1994 40	
	19 April 1994 101	
	13 May 1994 102	
Herbicide	4 November 1993	Sting 2.0 l/ha
	23 March 1994	Arelon 1.9 l/ha
		Cheetah R 0.75 l/ha
		Actipron 1%
	30 April 1994	Starane 0.4 l/ha
		Oxytril CM 0.25 l/ha
Mechanical weeding	1 May 1994	Einbock x 2
Fungicide	27 May 1994	Folicur 1.0 l/ha
Insecticide	None	
PGR	None	
Harvest date	3 August 1994	

Appendix 29. 1994 ADAS Boxworth, Field: Long Field - Winter beans

Integrated crop details

Crop	Winter Beans
Cultivar	Punch
Previous Cultivationss	Drill, plough, Maschio
Sowing date	3 November 1993
Seedrate	200 kg/ha
fertiliser	None
Herbicide	19 May 1994 Laser 1.0 l/ha
Desiccant	None
Fungicide	None
Insecticide	None
PGR	None
Harvest date	13 August 1994

Appendix 30. 1994 ADAS Boxworth, Field: Taylors - Winter wheat

Integrated crop details

Crop:	2nd Winter Wheat	
Previous Cultivations	Opico x 2, Maschio, drill, harrow	
Cultivar:	Cadenza	
Sowing date:	29 October 1993	
Seedrate:	200 kg/ha	
Fertiliser	8 March 1994 40 kg/ha N	
	21 April 1994 90 kg/ha N	
	15 May 1994 91 kg/ha N	
Herbicide:	18 October 1993 Sting 2.0 l/ha	
	1 May 1994	Ally 7.5 g/ha
	1 May 1994	Astix 0.5 l/ha
	26 March 1994	Arelon 1.9 l/ha
		Cheetah R 0.75 l/ha
		Actipron 1% (Part only)
	1 June 1994	Starane 0.5 l/ha
Mechanical weeding	1 May 1994	Einbock x 2
Fungicide:	1 June 1994	Genie 0.5 l/ha
		Bravo 1.0 l/ha
Insecticide:	17 June 1994	Dursban 4 0.75 l/ha
PGR:	1 May 1994	Stand-up 1.75 l/ha
Harvest date	2 August 1994	

Appendix 31. 1994 ADAS Boxworth, Field: Barons Hill - Linseed

Integrated crop details

Crop	Linseed
Cultivar	Antares
Cultivations	Plough, Vaderstad x 2, Einbock, drill, Einbock, roll
Sowing date	26 April 1994
Seedrate	53 kg/ha
Fertiliser	11 May 1994 70 kg/ha N
Herbicide	2 June 1994 Laser 1.0 l/ha
	10 June 1994 Ally 20 g/ha
Desiccant	14 August 1994 Reglone 3.0 l/ha
	Activator 90 0.4 l/ha
Fungicide	None
Insecticide	9 May 1994 Fastac 0.1 l/ha
PGR	None
Harvest date	27 July 1994

Appendix 32. 1994 ADAS Boxworth, Field: Extra Close - linseed

Integrated crop details

Crop	Linseed
Cultivar	Antares
Cultivations	Plough, Vaderstad, x 2 Einbock, drill, Einbock, roll
Sowing date	26 April 1994
Seedrate	53 kg/ha
Fertiliser	11 May 1994 70 kg/ha N
Herbicide	2 June 1994 Laser 1.0 l/ha
	10 June 1994 Ally 20 g/ha
Desiccant	14 August 1994 Reglone 3.0 l/ha
	Activator 90 0.4 l/ha
Fungicide	None
Insecticide	9 May 1994 Fastac 0.1 l/ha
PGR	None
Harvest date	24 August 1994

Appendix 33. 1994 ADAS Boxworth, Field: Childerley - Winter wheat

Integrated crop details

Crop	1st Winter Wheat
Previous Cultivationss	Chop beans, Paraplow, plough, Maschio, Vaderstad, drill, harrow
Cultivar	Spark
Sowing date	20 October 1993
Seedrate	190 kg/ha
Fertiliser	8 March 1994 40 kg/ha N
	20 April 1994 90 kg/ha N
	15 May 1994 90 kg/ha N
Herbicide	30 April 1994 Oxytril CM 1.0 l/ha
	Astix 1.5 l/ha
Mechanical weeding	1 May 1994 Einbock x 2
Fungicide	30 May 1994 Folicur 0.6 l/ha
	Bravo 1.0 l/ha
Insecticide	15 June 1994 Dursban 4 0.75 l/ha
PGR	None
Harvest date	9 August 1994

Appendix 34. 1995 ADAS Boxworth, Field:Thorofare - winter beans

Integrated Crop details

Crop	Winter Beans		
Cultivar:	Punch		
Cultivations:	Mole, drill, plough, Maschio		
Sowing date:	27 October 1994		
Seed rate:	204 kg/ha		
Seed dressing:	None		
Fertiliser:	T.S.P	207 kg/ha	26 Sept 94
Herbicide:	Laser	1.0l/ha	
	Actipron	1.6l/ha	21 Mar 95
Fungicides:	None		
Harvest:	8 August 1995		

Appendix 35. 1995 ADAS Boxworth, Field: Long Field - winter wheat

Integrated Crop details

Crop	Winter Wheat		
Cultivar:	Spark		
Cultivations:	Rau, roll		
Sowing date:	5 October 1994		
Seed rate:	173 kg/ha		
Seed dressing:	Sibutol		
Fertiliser:	Nitrogen 34.5%	43kg/ha N	21 Mar 95
	Nitrogen 34.5%	85kg/ha N	7 Apr 95
	Nitrogen 34.5%	79kg/ha N	29 Apr 95
Herbicide:	Roundup	3.0l/ha	13 Sept 94
	Arelon	1.8l/ha	
	+Cheetah R	0.75l/ha	
	+Actipron	0.5%	2 Feb 95
	Astix	1.25l/ha	
	+Oxytril	0.75l/ha	8 Apr 95
	Cheetah R	3.0l/ha	28 Apr 95
Fungicides:	Radar	0.5l/ha	25 May 95
	Folicur	0.25l/ha	3 Jul 95
PGR:	None		
Insecticides:	Aphox	140g/ha	5 Jul 95
Harvest:	7 August 1995		

Appendix 36. 1995 ADAS Boxworth, Field:Taylors - linseed

Integrated Crop details

Crop	Linseed		
Cultivar:	Antares		
Cultivations:	chop WW, disc, Maschio, Sting, plough, Maschio, harrow, drill, harrow, roll, drill, roll		
Sowing date:	30 March 1995		
Redrill sowing date:	15 May 1995		
Seed rate:	67kg/ha		
Redrill seed rate:	44kg/ha		
Seed dressing:	Prelude		
Fertiliser:	T.S.P	207 kg/ha	23 Sept 94
	Nitrogen 34.5%	71kg/ha N	10 Apr 95
Herbicide:	Sting CT	3.0l/ha	11 Mar 95
	Fusilade 5	0.75l/ha	
	+ Agral	0.2l/ha	5 Jul 95
	Reglone	3.0l/ha	
	+ Agral	0.4l/ha	22 Aug 95
Fungicides:	None		
Insecticide:	Cypermethrin	0.25l/ha	28 Apr 95
	Gammacol	0.35l/ha	30 May 95
Harvest:	21 September 1995		

Appendix 37. 1995 ADAS Boxworth, Field: Barons Hill - winter wheat

Integrated Crop details

Crop	Winter Wheat		
Cultivar:	Soissons		
Cultivations:	Rau, roll		
Sowing date:	17 October 1994		
Seed rate:	190 kg/ha		
Seed dressing:	Sibutol		
Fertiliser:	T.S.P	206 kg/ha	24 Sept 94
	Nitrogen 34.5%	44kg/ha N	22 Mar 95
	Nitrogen 34.5%	69kg/ha N	5 Apr 95
	Nitrogen 34.5%	67kg/ha N	28 Apr 95
Herbicide:	Starane (headland only)	0.75l/ha	1 May 95
Fungicides:	Radar	0.5l/ha	22 May 95
	Folicur	0.25l/ha	3 July 95
PGR:	Atlas CCC	2.2l/ha	3 Apr 95
Insecticides:	None		
Harvest:	28 July 1995		

Appendix 38. 1995 ADAS Boxworth, Field: Extra Close - winter wheat
Integrated Crop details

Crop	Winter Wheat		
Cultivar:	Soissons		
Cultivations:	Rau, roll		
Sowing date:	18 October 1994		
Seed rate:	190 kg/ha		
Seed dressing:	Sibutol		
Fertiliser:	Nitrogen 34.5%	31kg/ha N	22 Mar 95
	Nitrogen 34.5%	67kg/ha N	8 Apr 95
	Nitrogen 34.5%	70kg/ha N	1 May 95
Herbicide:	Arelon	3.7l/ha	
	+ Panther	1.0l/ha	21 Nov 94
Fungicides:	Radar	0.5l/ha	22 May 95
	Folicur	0.25l/ha	3 July 95
PGR:	Atlas CCC	1.65l/ha	5 Apr 95
Insecticides:	Aphox	140g/ha	5 Jul 95
Harvest:	28-29 July 1995		

Appendix 39. 1995 ADAS Boxworth, Field: Childerley - winter wheat
Integrated Crop details

Crop	Second Winter Wheat		
Cultivar:	Cadenza		
Cultivations:	Rau		
Sowing date:	2 November 1994		
Seed rate:	200 kg/ha		
Seed dressing:	Sibutol		
Fertiliser:	Nitrogen 34.5%	41kg/ha N	21 Mar 95
	Nitrogen 34.5%	78kg/ha N	10 Apr 95
	Nitrogen 34.5%	79kg/ha N	29 Apr 95
Herbicide:	Sting	2.0l/ha	7 Oct 94
	Arelon	1.8l/ha	
	+Cheetah R	0.75l/ha	
	+Actipron	0.5%	21 Mar 95
	Cheetah R	3.0l/ha	3 May 95
Fungicides:	Radar	0.5l/ha	23 May 95
PGR:	None		
Insecticides:	Aphox	140g/ha	5 Jul 95
Harvest:	5 August 1995		

Appendix 40. 1996 ADAS Boxworth, Field: Thorofare - 1st Winter wheat

Integrated crop details

Crop	1st Winter wheat	
Cultivar	Consort	
Previous Cultivations	chop w beans, heavy disc, Rau	
Sowing date	3.10.95	
Seedrate	198 kg ha^{-1}	
Fertiliser	11.3.96	BASF 40 kg ha^{-1} N
	15.4.96	BASF 65 kg ha N
	1.5..96	BASF 53 kg ha^{-1} N
Herbicide	15.1.96	Stefes IPU 4.0 l ha^{-1}
		Stomp 2.0 l ha^{-1}
	26.4.96	Hurler 0.75 l ha^{-1} (part)
Fungicide	7.6.96	Opus 0.5 l ha^{-1}
Insecticide	nil	
PGR	nil	
Harvest date	20.8.96	

Appendix 41. 1996 ADAS Boxworth, Field: Long Field - 2nd Winter wheat

Integrated crop details

Crop	2nd Winter Wheat	
Previous Cultivationss	chop WW, plough, Rau	
Cultivar	Hussar	
Sowing date	11.10.95	
Seedrate	207 kg ha^{-1}	
fertiliser	8.3.96	BASF 40 kg ha^{-1} N
	11.4.96	BASF 75 kg ha^{-1} N
	1.5.96	BASF 32 kg ha^{-1} N
Herbicide	15.1.96	Stefes IPU 4.0 l ha^{-1}
		Stomp 2.0 l ha^{-1}
Fungicide	7.6.96	Radar 0.5 l ha^{-1}
Insecticide	nil	
PGR	nil	
Harvest date	19.8.96	

Appendix 42. 1996 ADAS Boxworth, Field: Taylors - 1st winter wheat

Integrated crop details

Crop:	1st winter wheat	
Previous Cultivations	chopped linseed, Rau	
Cultivar:	Soissons	
Sowing date:	12.10.95	
Seedrate:	192 kg ha^{-1}	
Fertiliser	12.3.96	BASF 40 kg ha^{-1} N
	15.4.96	BASF 60 kg ha^{-1} N
Herbicide:	15.1.96	Stefes IPU 4.0 l ha^{-1}
		Stomp 2.0 l ha^{-1}
	26.4.96	Ally 10 g ha^{-1}
Fungicide	7.6.96	Radar 0.5 l ha^{-1}
Insecticide:	nil	
Molluscicide:	nil	
PGR	nil	
Harvest date	6/8/98	

Appendix 43. 1996 ADAS Boxworth, Field: Barons Hill - Winter beans

Integrated crop details

Crop	Winter beans	
Previous Cultivations	Chop WW, Drill, plough, Maschio	
Cultivar	Punch	
Sowing date	20.10.95	
Seedrate	113 kg ha^{-1}	
Fertiliser	0	
Herbicide	31.3.96	Laser 1.0 l ha^{-1}
		Spray Prover 1.6 l ha^{-1}
Mechanical weeding	25.4.96	Einbock x 1
Desiccant	None	
Fungicide	None	
Insecticide	None	
PGR	None	
Harvest date	5.9.96	

Appendix 44. 1996 ADAS Boxworth, Field: Extra Close - Winter beans

Integrated crop details

Crop	Winter beans
Cultivar	Punch
Previous Cultivations	Chop WW, drill, plough, Maschio
Sowing date	19.10.95
Seedrate	186 kg ha^{-1}
Fertiliser	0
Herbicide	31.3.96 Laser 1.0 l ha^{-1}
	Spray Prover 1.6 l ha^{-1}
Mechanical weeding	25.4.96 Einbock x 1
Desiccant	None
Fungicide	None
Insecticide	None
PGR	None
Harvest date	5.9.96

Appendix 45. 1996 ADAS Boxworth, Field: Childerley - winter linseed

Integrated crop details

Crop	Winter linseed
Cultivar	Oliver
Previous Cultivationss	Chop WW, Heavy discs x 2, Flexitine, Maschio, Drill, Roll
Sowing date	3.10.95
Seedrate	51 kg ha^{-1}
Fertiliser	19.3.96 BASF 60 kg ha^{-1} N
Herbicide	15.11.95 Laser 1.0 l ha^{-1}
	Spray Prover 1.6 l ha^{-1}
	16.6.96 Ally 30 g ha^{-1}
Desiccant	19.7.96 Reglone 3.0 l ha^{-1}
	Enhance 0.4 l ha^{-1}
Fungicide	
Insecticide	nil
PGR	nil
Harvest date	5.8.96

Appendix 46. 1997 ADAS Boxworth, Field: Thorofare Field - winter wheat

Integrated crop details

Crop	2nd Winter Wheat	
Previous Cultivationss	chop WW, rau, roll	
Cultivar	Reaper	
Sowing date	9.10.96	
Seedrate	209 kg ha^{-1}	
fertiliser	6.3.97	40 kg ha^{-1} N
	28.4.97	41 kg ha^{-1} N
Herbicide	16.1.97	hytane 4.2 l ha^{-1}
		Stomp 1.5 l ha^{-1}
	7.4.97	Starane (part field) 0.65 l ha^{-1}
Fungicide	15.5.97	Opus 0.5 l ha^{-1}
Insecticide	nil	
PGR	nil	
Harvest date	8.8.97	

Appendix 47. 1997 ADAS Boxworth, Field: Long Field - winter linseed

Integrated crop details

Crop	Winter linseed	
Previous Cultivationss	Chop WW, Opico, Maschio, Drill, Roll	
Cultivar	Oliver	
Sowing date	25.9.96	
Seedrate	50 kg ha^{-1}	
Fertiliser	8.3.97	60 kg ha^{-1} N
Herbicide	14.11.96	Laser 0.5 l ha^{-1}
		Comulin 1.6 l ha^{-1}
	4.4.97	Ally 30 g ha^{-1}
	18.4.97	Laser 0.5 l ha^{-1}
		Spray prover 1.8 l ha^{-1}
Desiccant	11.7.97	Standon Diquat 3.0 l ha^{-1}
		Vassgro wetter 0.4 l ha^{-1}
Fungicide	nil	
Insecticide	28.5.97	Cyperkill 10 0.25 l ha^{-1}
PGR	nil	
Harvest date	4.8.97	

Appendix 48. 1997ADAS Boxworth, Field: Taylors - winter beans

Integrated crop details

Crop	Winter beans	
Cultivar	Punch	
Previous Cultivations	Chop WW, drill, plough, Maschio	
Sowing date	25.10.96	
Seedrate	193 kg ha^{-1}	
Fertiliser	0	
Herbicide	11.11.96	Unicrop flowable simazine 2.2 l ha^{-1}
Mechanical weeding	27.3.96	Einbock
Desiccant	nil	
Fungicide	nil	
Insecticide	nil	
PGR	nil	
Harvest date	13.8.97	

Appendix 49. 1997 ADAS Boxworth, Field: Extra Close - winter wheat

Integrated crop details

Crop	1st Winter wheat	
Previous Cultivations	chop w beans, plough, maschio, roll, Rau, roll	
Cultivar	Consort	
Sowing date	3.10.95	
Seedrate	198 kg ha^{-1}	
Fertiliser	7.3.97	38 kg ha^{-1} N
	28.4.97	67 kg ha^{-1} N
Herbicide	16.1.97	Stefes IPU 4.2 l ha^{-1}
		Stomp 1.5 l ha^{-1}
	7.4.97	Oxytril CM 1.0 l ha^{-1}
		Starane 0.65 l ha^{-1}
	1.5.97	Commando 3.5 l ha^{-1}
Fungicide	15.5.97	Opus 0.5 l ha^{-1}
Insecticide	nil	
PGR	nil	
Harvest date	6.8.97	

Appendix 50. 1997 ADAS Boxworth, Field: Childerley - winter wheat

Integrated crop details

Crop:	1st winter wheat	
Cultivar:	Reaper	
Previous Cultivations	chopped linseed, plough, maschio, Rau, roll	
Sowing date:	7.10.96	
Seedrate:	181 kg ha^{-1}	
Fertiliser	7.3.97 40 kg ha^{-1} N	
	5.4.97 68 kg ha^{-1} N	
	24.4.97 59 kg ha^{-1} N	
Herbicide:	16.1.97	Hytane 4.2 l ha^{-1}
		Stomp 1.5 l ha^{-1}
	7.4.97	Campbells CMPP 2.3 l ha^{-1}
		Oxytril CM 1.25 l ha^{-1}
Fungicide	15.5.97 Opus 0.75 l ha^{-1}	
Insecticide:	nil	
PGR	nil	
Harvest date	8.8.97	

Appendix 51. 1993 ADAS High Mowthorpe, Field: Kirby West - Winter wheat

Integrated crop details

Crop	Winter wheat
Cultivar	Mercia
CultivationssDeep tine, Rotary cultivate	
Drilling date	12 Oct
Seedrate	160 kg/ha
P&K	70 kg/ha Potash (as Muriate)
	22 Feb
Nitrogen	220 kg/ha N (Nitram)
	17 Mar - 40 kg/ha N
	28 Mar - 90 kg/ha N
	17 May - 90 kg/ha N
Herbicide	1.5 l/ha Astix
	0.75 l/ha Deloxil 29 April
Fungicide	0.5 l/ha Corbel 3 May
	0.75 l/ha Dorin +
	1 l/ha Bombardier
	(flag) 1 June
Insecticide	None
Harvest date	19 September

Appendix 52. 1993 ADAS High Mowthorpe, Field: Tommy Ireland - Winter wheat

Integrated crop details

Crop	Winter wheat
Cultivar	Mercia
Cultivations	Disc, Deep tine (x2), Spring tine & flexicoil, Cambridge roll
Drilling date	12 Oct
Seedrate	180 kg/ha
P&K	50 kg/ha Phosphate
	50 kg/ha Potash (as 0:24:24)
	19 Feb
Nitrogen	220 kg/ha N
	17 Mar - 40 kg/ha N
	28 Mar - 90 kg/ha N
	17 May - 90 kg/ha N
Herbicide	1.5 l/ha Astix +
	1 l/ha Deloxil 6 May
Mechanical weeding	Tearaway - 28 April
Fungicide	0.75 l/ha Dorin +
	1 l/ha Bombardier 3 June
Insecticide	56 g/ha Aphox - 17 July
Harvest date	24 September

Appendix 53. 1993 ADAS High Mowthorpe, Field: Warren, - spring beans

Integrated crop details

Crop	Spring beans
Cultivar	Casper
Cultivations	Beans, broadcast and shallowly (16 cm) ploughed in, followed by spring tine - 2 Feb
Drilling date	2 Feb
Seedrate	292 kg/ha
P&K	30 kg/ha Phosphate
	60 kg/ha Potash (0:24:24, topped up with Muriate of potash), 22 Dec
Nitrogen	None
Herbicide	
Mechanical weeding	Tearaway - 24 May
Fungicide	1 l/ha Ashlade carbendazim
	2 l/ha Rover 500 - 25 June
Pre-harvest treatment	3 l/ha Reglone - 23 Sept
Harvest date	15 October

Appendix 54. 1993 ADAS High Mowthorpe, Field: Kirby North - Seed Potatoes

Integrated Crop details

Crop	Potatoes
Cultivar	Cara
Cultivations	Ploughed, Bed formed, Stone separation, Ridge and plant
Planting date	29 Mar
Seed rate	4.88 kg/ha
Seed size	45-55 mm
P & K	291 kg/ha Phosphate (Di-ammonium phosphate
	240 kg/ha Potash (muriate of potash), 15 March
Mg	20 kg/ha Mg calcined magnesite), 15 Dec
Nitrogen	150 kg/ha N (Di-ammonium phosphate + Nitram), 15 March
Herbicide	0.5 kg/ha Sencorex, 5 May
Fungicide	2.5 kg/ha Trustan, 3 June, 16 June, 28 June
	2 kg/ha Fubol 75 WG, 12 July
	560 ml/ha Supertin, 22 July
Insecticide	280 g/ha Aphox,b 28 May, 3 June, 16 June, 28 June, 12 July, 22 July
Desiccation	225 l/ha Sulphuric acid, 29 July
	225 l/ha Sulphuric acid, 4 August
	3 l/ha Reglone, 18 September
Harvest date	6 October

Appendix 55. 1995 ADAS High Mowthorpe, Field: Tommy Ireland - winter wheat

Integrated Crop details

Crop	Winter Wheat following seed potatoes		
Cultivar:	Hereward		
Cultivations:	Tine (haulm clearing) 4 Oct 1994, Deep tine 4 Oct 1994, Spring tine and drill 5 Oct 1994, Rolled 10 Oct 1994		
Sowing date:	5 Oct 1994		
Seed rate:	181 kg/ha		
Seed dressing:	Cerevax		
Fertiliser:	Nitram	116 kg/ha (40 kg/ha N)	16 Mar 1995
	Nitram	289 kg/ha (100 kg/ha N)	11 April 1995
	Nitram	261 kg/ha (90 kg/ha N)	25 April 1995
Mechanical weeder:	6 May 1995		
Herbicide:	Panther	1 l/ha	25 Jan 1995
	Starane	0.5 l/ha	26 May 1995
Fungicides:	Opus Team	1.2 l/ha	6 June 1995
Insecticides:	Aphox	140 g/ha	13 July 1995
PGR:	None		
Harvest:	12 August 1995		

Appendix 56. 1994 ADAS High Mowthorpe, Field name: Warren -winter wheat

Integrated crop

Cultivar	Hereward
Crop	winter wheat
Primary Cultivations	Plough and furrow press, Rotary Cultivations and drill, Rolled
Drilling date	30 Oct 1993
Seed rate	182 kg/ha
Nitrogen	40 kg/ha N (Nitram) 8 Mar 1994
	160 kg/ha N (Nitram) 28 Apr 1994
Herbicide	0.5 l/ha Starane 2 + 1 l/ha MSS Optica- 1 May
Fungicide	0.75 l/ha Sportak 26 May 1994
	0.75l/ha Silvacur & 1l/ha Rover 500 13 June 1994
Insecticide	None
PGR	None

Appendix 57. 1994 ADAS High Mowthorpe, Field name: Kirby North - winter wheat

Integrated crop

Primary	Deep tine (2 passes), Spring tine and flexicoil, drill,Rolled
Drilling date	19 Oct 1993
Cultivar	Hereward
Seed rate	182 kg/ha
Nitrogen	40 kg/ha N (Nitram) 8 Mar 1994
	170 kg/ha N (Nitram) 28 April 1994
Herbicide	O.5 l/ha Starane 2 + 0.5 l/ha Oxytril CM 1 May 1994
Fungicide	0.75 l/ha Silvacur 13 June 1994
Insecticide	
PGR	

Appendix 58. 1994 ADAS High Mowthorpe, Field name: Kirby South - spring beans

Integrated crop

Crop	Spring beans
Cultivar	Victor
Cultivationss	Broadcast & Ploughed, Rotary cultivate
Drilling date	10 Mar 1994
Seed rate	272 kg/ha
Nitrogen	No nitrogen
Herbicide	Roundup 3 l/ha 18 Feb 1994
	5l/ha Monarch 11 Apr 1994
Fungicide	None
Molluscicides	None
Pre-harvest treatment	3l/ha Reglone

Appendix 59. 1994 ADAS High Mowthorpe, Field name: Tommy Ireland - Potatoes

Integrated crop

Crop	Potatoes
Cultivar	Cara
Primary Cultivations	Plough, Ridge up, stone separate & plant
Cover crop	Natural regeneration (predominantly rye grass)
Drilling date	5 April 1994
Seed rate	
P,K and Mg applied	Triple super phosphate at 355 kg/ha 17 Mar 1994
	Muriate of potash at 450 kg/ha 6 Jan 1994
	Cal Mag at 62.5 kg/ha 4 Jan 1994
Nitrogen	95 kg/ha N (as Nitram) 3
	5 kg/ha N (as Nitram) 20 June 1994
Herbicide	0.5 l/ha Sencorex 19 May 1994
Fungicide	2.5 kg/ha Trustan 13 & 27 June &12 July 1994
	2 kg/ha Curzate, 23 July 1994
	225 ml/ha Shirlan, 3 August 1994
	560ml Supertin 4L 20 August 1994
Insecticide	280g/ha Aphox 13 & 27 June , 12 July, 23 July & 3 August
Dessicant	168.5 l/ha Sulphuruc acid 12 August 1994
	225 l/ha Sulphuric acid 15 August 1994
	168.5 l/ha Sulphuric acid 4 September 1994

Appendix 60. 1995 ADAS High Mowthorpe, Field: Kirby West - spring beans

Integrated Crop details

Crop	Spring Beans following set-aside		
Cultivar:	Victor		
Cultivations:	Drop drilled & Ploughed 13 March 1995, Rotary Cultivate (Machio) 14 March 1995		
Sowing date:	13 March 1995		
Seed rate:	288 kg/ha		
Seed dressing:	re-cleaned, single purpose dressed		
Fertiliser:	None		
Herbicide:	Roundup	3.0 l/ha	9 Mar 95
	Basagran	1.5 l/ha	6 June 95
Fungicides:	None		
Insecticides:	Cypermethrin	250 ml/ha	15 May 95
Desiccant:	None		
Harvest:	21 August 1995		

Appendix 61. 1995 ADAS High Mowthorpe, Field:Warren - potatoes

Integrated Crop details

Crop	Seed potatoes following winter wheat		
Cultivar	Cara		
Cover crop:	Cereal mix (32% Barley, 20% wheat, 48% Oats) 130 kg/ha		
	Drop drill & disc in	4 Oct 1994	
Cultivations:	Ploughed 11 Jan 1995, Deep tine 23 March, Bedform 3 April, Stone separate 11 April		
Sowing date:	6-9 April 1995		
Seed rate:			
Seed dressing:	Fungazil		
Fertiliser:	Cal Mag	50 kg/ha	1 Dec 94
	Muriate of potash	500 kg/ha (300 kg/ha K20)	1 Dec 94
	Di Ammonium Phosphate	478 kg/ha (86 kg/ha N, 220 kg/ha P_2O_5)	
	Extran	186 kg/ha (64 kg/ha N)	5 June 95
Mechanical weeder:	9 May 1995		
Herbicide:	Sencorex	0.5 kg/ha	11 May 95
Rogued:	27 June 1995		
Fungicides:	Trustan	2.5 kg/ha	16 June 95
	Trustan	2.5 kg/ha	28 June 95
	Trustan	2.5 kg/ha	12 July 95
	Trustan	2.5 kg/ha	19 July 95
	Shirlan	300ml/ha	31 July 95
	Shirlan	300ml/ha	11 Aug 95
	Shirlan	300ml/ha	6 Sept 95
Insecticide:	Aphox	280 g/ha	23 May, 16 June, 28 June, 12 July, 31 July, 11 August & 6 September 1995
Desiccation:	Sulphuric acid	168 l/ha x 2	23 Aug 95
Harvest:	26 September 1995		

Appendix 62. 1995 ADAS High Mowthorpe, Field: Kirby South - winter wheat

Integrated Crop details

Crop	Winter wheat following S.beans		
Cultivar:	Hereward		
Cultivations:	Rotaspike and drill 30 Sept 1994, Rolled 1 Oct 1994		
Sowing date:	30 Sept 1994		
Seed rate:	180 kg/ha		
Seed dressing:	Cerevax		
Fertiliser:	0:20:30	426 kg/ha	5 April 1995
	Nitram	121 kg/ha (42 kg/ha N)	16 Mar 1995
	Nitram	284 kg/ha (98 kg/ha N)	11 April 1995
	Nitram	312 kg/ha (107 kg/ha N)	24 April 1995
Herbicide:	Panther	1 l/ha	25 Jan 1995
	CMPP-P	0.8 l/ha	5 May 1995
	Starane	0.5 l/ha	30 May 1995
Fungicides:	Opus Team	1 l/ha	6 June 1995
Insecticides:	Aphox	140 g/ha	21 July 1995
Plant growth regulators:	None		
Harvest:	10 August 1995		

Appendix 63. 1996 ADAS High Mowthorpe, Field: Kirby West, Winter wheat

Integrated Crop details

Crop	Winter wheat
Cultivar	Hereward
Cultivations	Tine, Rotary cultivate and drill
Drilling date	26/9/96
Seed rate	190 kg/ha
Seed dressing	Sibutol
P,K and Mg applied	Nil
Nitrogen	Extran 116 kg/ha (40 kg/ha N), 29/3/96
	Extran 303 kg/ha (104 kg/ha N), 29/4/96
	Extran 73 kg/ha (25 kg/ha N), 23/5/96
Herbicide	Oxytril 1.0 l/ha + Astix 0.75 l/ha, 31/10/96
	Starane-2 0.75 l/ha, 30/4/96
Fungicide	Tilt 0.25 l/ha, 13/5/96
	Opus 0.5 l/ha + Bravo 1.0 l/ha, 7/6/96
Plant growth regulator	Nil
Insecticide	Nil
Pre-harvest treatment	Nil
Harvest	31/8/96

Appendix 64. 1996 ADAS High Mowthorpe, Field: Warren, Winter wheat

Integrated crop details

Crop:	Winter wheat
Cultivar:	Hereward
Cultivations:	Deep tine x 2 passes, Spring tine and flexicoil, Drill, Flexiroll,
Drilling date:	3/10/95
Seed rate	190 kg/ha
Nitrogen	Extran 113 kg/ha (39 kg/ha N), 29/3/96
	Extran 269 kg/ha (93 kg/ha N), 30 /4/96
	Extran 250 kg/ha (65 kg/ha N), 23/5/96
Herbicide	Starane 0.75 l/ha, 30/4/96
Fungicide	Tilt 0.25 l/ha + Tern 0.4 l/ha 24/5/96
	Opus 0.5 l/ha + Bravo 1.0 l/ha 6/6/95
Insecticide	Nil
Plant growth regulator	Nil
Pre-harvest treatment	Roundup 3 l/ha + Frigate 1 l/ha (Wetter), 15/8/95
Harvest	30/8/96

Appendix 65. 1996 ADAS High Mowthorpe, Field: Kirby North - S.Beans

Integrated crop details

Crop	Spring beans
Cultivar	Victor
Cultivations	Ploughed, Rotary cultivator + Flexicoil then drilled,
Drilling date	18/3/96
Seed rate	361 kg/ha
Basal Fertiliser	Nil
Nitrogen	Nil
Herbicide	Glyphogan 3 l/ha (Set-aside destruction), 6/3/96
	Reflex-T 3 l/ha, 24/3/96
Fungicide	Nil
Molluscicides	Nil
Insecticides	Decis 300 ml/ha,18/7/96
Pre-harvest treatment	Reglone 3 l/ha, 6/9/96
Harvest	18/9/96

Appendix 66. 1996 ADAS High Mowthorpe, Field: Kirby South, Seed potatoes

Integrated crop details

Crop	Potatoes
Cultivar	Cara
Cultivations	Deep Cultivated, Bedformed, Stone separated, Post planting ridging
Planting date	11/4/96
Seed rate	35-45mm 3.59 t/ha
	45-55mm 4.85 t/ha
P,K and Mg applied	Muriate of potash 430 kg/ha (258 kg/ha K_20), 15/1/96
	Cal-mag, 102 kg/ha (48 kg/ha Mg), 16/1/96
	Di-ammonium phosphate 455 kg/ha (81 kg/ha N + 182 kg/ha P_20_5), 29/3/96
Nitrogen	See DAP above (81 kg/ha N)
	Extran 218 kg/ha (75 kg/ha N), 23/6/96
Herbicide	Graminol-5 5 l/ha, 18/5/96
Fungicide	Trustan 2.5 kg/ha, 4/6/96
	Trustan 2.5 kg/ha, 27/6/96
	Curzate 2 kg/ha, 9/7/96
	Shirlan 300ml/ha, 23/7/96
	Supertin 4L 560 ml/ha, 4/8/96
	Supertin 4L 560, ml/ha 17/8/96
Insecticide	Aphox 280 g/ha, 4/6/96
	Aphox 280 g/ha, 13/6/96
	Aphox 280 g/ha, 27/6/96
	Aphox 280 g/ha, 9/7/96
	Aphox 280 g/ha, 23/7/96
	Cyperkill 750 ml/ha, (headland only) 27/7/96
	Aphox 280 g/ha, 4/8/96
Desiccation	Sulphuric acid 225 l/ha 8/8/96
	Sulphuric acid 225 l/ha 12/8/96
	Sulphuric acid 113 l/ha 20/8/96
	Mechanical flail 12/9/96
Harvest	16/9/96
Haulm disposal	Raked off and burnt
Pre-storage treatment	Fungazil 100ml/tonne

Appendix 67. 1997 ADAS High Mowthorpe, Field: Kirby West - Seed potatoes

Integrated crop details

Crop	Potatoes
Cultivar	Cara
Cultivations	Deep Ploughed, Deep Cultivated, Bedformed, Stone separated, Post planting ridging
Planting date	5-9/4/97
Variety	Cara
Seed dressing	Fungazil applied pre-storage Monceren (1kg/tonne seed), applied at planting
Seed rate	35-45mm 3.7 t/ha 45-55mm 4.9 t/ha
P,K and Mg applied	Muriate of potash kg/ha (kg/ha K_20), (26/11/96) 444 kg/ha mono ammonium phosphate (16:40:0) (177 kg/ha P_20_5 + 71 kg/ha N) (28/3/97)
Nitrogen	71 kg/ha N - see above 258 kg/ha Extran (89 kg/ha N) (10/6/97)
Herbicide	4 l/ha Roundup (23/9/96) 0.5 kg/ha Sencorex early post-em (25/5/97)
Fungicide	2.8 kg/ha Trustan (3/6/97) 2 kg/ha Curzate (28/6/97 & 26/7/97) 300 ml/ha Shirlan (11/7/97 & 19/7/97) 560 ml/ha Supertin 4L (2/8/97, 8/8/97 & 26/8/97)
Insecticide	280g/ha Aphox (4/6/97, 13/6/97, 11/7/97, 26/7/97, 2/8/97 & 8/8/97)
Desiccation	225 l/ha Sulphuric acid (17/8/97 & 19/8/97)
Harvesting	18-24/9/97
Haulm disposal	Topped (Grimme Cutlass) (13/9/97)
Pre-storage treatment	Fungazil applied going into store (1 litre per 10 tonnes)

Appendix 68. 1997 ADAS High Mowthorpe, Field: Tommy Ireland - S.Beans

Integrated crop details

Crop	Spring beans
Cultivar	Victor
Cultivations	Ploughed, Rotary Cultivator, drill, Flexicoil
Drilling date	13/3/97
Seed rate	254 kg/ha
Basal Fertiliser	Nil
Nitrogen	Nil
Herbicide	2.5 l/ha Reflex-T (25/3/97)
Fungicide	1.5 l/ha Folio (4/7/97)
Molluscicides	Nil
Insecticides	Nil
Pre-harvest treatment	3.0 l/ha Reglone (9/9/97)
Harvesting	9/9/97

Appendix 69. 1997 ADAS High Mowthorpe, Field: Kirby North - Winter wheat

Integrated crop details

Crop	Winter wheat
Cultivar	Hereward
Cultivations	Rotaspike, Spring tine + Flexicoils, Roll
Drilling date	3/10/96
Seed rate	183 kg/ha
Seed dressing	Sibutol
P,K and Mg applied	Nil
Nitrogen	111 kg/ha Extran (38 kg/ha N), (14/3/96)
	297 kg/ha Extran (102 kg/ha N), (2/4/97)
	268 kg/ha Extran (92 kg/ha N) (22/4/97)
Herbicide	1.25 l/ha Panther + 0.8 l/ha MSS Optica (15/11/97)
	0.5 l/ha Starane (23/5/97)
Fungicide	0.5 l/ha Folicur (2/5/97)
	0.5 l/ha Opus (30/5/97)
Plant growth regulator	Nil
Insecticide	Nil
Pre-harvest treatment	1.5 l/ha Roundup (plus 1.0 l/ha Frigate (wetter)) (11/8/97)
Harvest	20/8/97

Appendix 70. 1997 ADAS High Mowthorpe, Field: Kirby South - Winter wheat

Integrated crop details

Crop	Potatoes
Cultivar	Hereward
Cultivations	Deep cultivated (Konskilde), Spring tines and Flexicoil, Rolled , drill, Flexirolls
Drilling date	2/10/96
Variety	
Seed rate	183 kg/ha
Seed dressing	Sibutol
Nitrogen	111 kg/ha Extran (38 kg/ha N) (14/3/97)
	302 kg/ha Extran (104 kg/ha N) (2/4/97)
	271 kg/ha Extran (93 kg/ha N) (22/4/97)
Herbicide	1.25 l/ha Panther (15/11/96)
	0.75 l/ha Starane-2 (6/4/97)
Fungicide	0.5 l/ha Folicur (2/5/97)
	0.5 l/ha Opus 28/5/97 (30/5/97)
Insecticide	Nil
PGR	Nil
Pre-harvest treatment	4 l/ha Roundup (plus Frigate (wetter) @1 l/ha)) (11/8/97)
Harvest	21/8/97

Appendix 71. 1993 SAC Pathhead, Field: Corselets - Spring oilseed rape

Integrated crop details

Crop	Spring oilseed rape
Cultivar	Puma
Cultivations	Plough, Power harrow, Drill, Cambridge roll
Sowing date	3/5/93
Seed rate	7.3 kg/ha
Fertiliser	64:64:64 kg/ha NPK - 20/4/93
	43kg/ha N - 14/6/93
Herbicide	0.5l/ha'Butisan S'-4/5/93
Fungicide	None
PGR	None
Insecticide	None
Desiccant	3l/ha'Reglone'+wetter-8/10/93
Harvest date	19/10/93

Appendix 72. 1993 SAC Pathhead, Field: Richardson's Rig - Winter wheat 1

Integrated crop details

Crop	Winter wheat 1
Cultivar	Beaver
Cultivations	Plough, Power harrow, Drill, Cambridge roll
Sowing date	15/10/92
Seed rate	250 kg/ha
Fertiliser	0:31:31kg/ha NPK - 14/10/92
	0:60:60kg/ha NPK - 19/2/93
	76kg/ha N - 14/3/93
	64kg/ha N - 27/4/93
Herbicide	15g/ha'Ally'+1l/ha'Duplosan'-3/5/93
Fungicide	0.25l/ha'Tern'+1l/ha'Imp.'Excel'-31/5/93
	1l/ha'ImpactExcel'-7/7/93
PGR	2.5l/ha'Chlormequat'-3/5/93
Insecticide	4kg/ha'Draza'-15/10/92
	140g/ha'Aphox'-7/7/93
Harvest date	29/9/93

Appendix 73. 1993 SAC Pathhead, Field: Bleakpen - Spring barley

Integrated crop details

Crop	Spring barley
Cultivar	Chariot
Cultivations	Plough, Power harrow, Drill, Cambridge roll
Sowing date	27/3/93
Seed rate	185 kg/ha
Fertiliser	61:61:61kg/ha NPK - 25/3/93
	45kg/ha N - 4/5/93
Herbicide	2.5l/ha'Swipe560'-27/5/93
	3l/ha'Roundup'-30/8/93
Trace elements	2.5l/ha'Mantrac'Mn-27/5/93
Harvest date	6/9/93

Appendix 74. 1994 SAC Pathhead Field: Under Langlands - Winter barley/Spring barley

Integrated crop details

Crop	Spring barley
Cultivar	Chariot
Cultivations	Plough, Power harrow, Cambridge roll
Sowing date	14/4/94
Seed rate	225 kg/ha
Fertiliser	60:60:60kg/ha NPK - 13/4/94
	64kg/ha N - 9/5/94
Herbicide	20g/ha'HarmonyM' - 3/6/94
Fungicide	None
PGR	None
Insecticide	None
Trace elements	1.25l/ha'Proleaf Mn' - 3/6/94
Harvest date	26/8/94

Appendix 75. 1994 SAC Pathhead Field: Bleakpen - Spring OSR

Integrated crop details

Crop	Spring oilseed rape
Cultivar	Starlight
Cultivations	Plough, Power harrow, Drill, Cambridge roll
Sowing date	21/4/94
Seed rate	8 kg/ha
Fertiliser	60:60:60kg/ha NPK - 13/4/94
	64kg/ha N - 30/5/94
Herbicide	0.75l/ha'ButisanS'-18/5/94
Desiccant	3l/ha'Harvest'-3/9/94
Harvest date	26/9/94

Appendix 76. 1994 SAC Pathhead, Field: Upper Langlands - Spring OSR

Integrated crop details

Crop	Spring oilseed rape
Cultivar	Starlight
Cultivations	Plough, Power harrow, Cambridge roll
Sowing date	27/4/94
Seed rate	8 kg/ha
Fertiliser	60:60:60kg/ha NPK - 13/4/94
	43kg/ha N - 30/5/94
Herbicide	0.5l/ha'ButisanS'-27/4/94
Desiccant	3l/ha'Harvest'-3/9/94
Fungicide	None
Insecticide	None
Harvest date	26/9/94

Appendix 77. 1994 SAC Pathhead Field: Cottage - Winter wheat 1

Integrated crop details

Crop	Winter wheat 1
Cultivar	Hunter
Cultivations	Plough, Power harrow, Drill, Cambridge roll
Sowing date	15/10/93
Seed rate	245 kg/ha
Fertiliser	6:30:30kg/ha NPK - 1/11/93
	12:60:60kg/ha NPK - 3/94
	64kg/ha N - 3/94
	97kg/ha N - 4/94
Herbicide	None
Fungicide	1l/ha'Impact Excel' - 15/6/94
PGR	None
Insecticide	4kg/ha'Metarex' - 15/10/93
Trace elements	6.3kg/ha'Manganese sulphate'
Harvest date	10/9/94 + 12/9/94

Appendix 78. 1995 SAC, Pathhead, Fieldname: Richardson's Rig - Winter wheat

Integrated Crop details

Crop	Winter Wheat after SAS		
Cultivar:	Hunter		
Cultivations:	Plough, power harrow, drill, cambridge roll		
Sowing date:	11 October 1994		
Seed rate:	238 kg/ha		
Seed dressing:	Beret		
Fertiliser:	Ammonium nitrate	183kg/ha (63kg/ha N)	23 Mar 95
	Ammonium nitrate	284kg/ha (98kg/ha N)	27 Apr 95
Herbicide:	Asset 1.0l/ha		
	+ Starane 2 0.5l/ha		12 Apr 95
Fungicides:	Tern 0.3l/ha		
	+ Alto 0.27l/ha(GS31)		5 May 95
	Folicur 0.3l/ha		
	+Bravo 0.67l/ha (GS39)		14 Jun 95
PGR:	Chlormequat 70 1.15l/ha		5 May 95
Insecticides:	None		
Harvest:	30 August 1995		

Appendix 79. 1995 SAC, Pathhead, Field: Under Langlands - spring oilseed rape

Integrated Crop details

Crop	Spring Oilseed Rape		
Cultivar:	Starlight		
Cultivations:	Plough, rau combination power harrow/drill		
Sowing date:	10 April 1995		
Seed rate:	7.1kg/ha		
Seed dressing:	Vitavax RS		
Fertiliser:	Triple 15	507kg/ha (76kg/ha N)	3 Apr 95
	Doubletop	185kg/ha (50kg/ha N +22kg/ha S)	10 May 95
Herbicide:	Butisan S	0.5l/ha	15 Apr 95
Fungicides:	None		
Insecticides:	Decis	0.25l/ha	15 Jun 95
Harvest:	14 September 1995		

Appendix 80. 1995 SAC, Pathhead, Field: Upper Langlands - winter wheat

Integrated Crop details

Crop	Winter Wheat after SOSR		
Cultivar:	Hunter		
Cultivations:	Plough, power harrow, drill, cambridge roll		
Sowing date:	3 October 1994		
Seed rate:	225 kg/ha		
Seed dressing:	Beret		
Fertiliser:	Ammonium nitrate	183kg/ha (63kg/ha N)	23 Mar 95
	Ammonium nitrate	368kg/ha (127kg/ha N)	27 Apr 95
Herbicide:	Ally 15g/ha		
	+Optica 1.0l/ha		12 Apr 95
Fungicides:	Tern 0.3l/ha +		
	Sportak Delta 0.625l/ha (GS30/31)		3 May 95
	Tern 0.25l/ha+		
	Folicur 0.3l/ha +		
	Bravo 0.67l/ha (GS45)		14 Jun 95
PGR:	Chlormequat 70 1.15l/ha		3 May 95
Insecticides:	None		
Harvest:	13 September 1995		

Appendix 81. 1995 SAC, Pathhead, Field: Cottage - spring barley

Integrated Crop details

Crop	Spring Barley		
Cultivar:	Chariot		
Cultivations:	Plough, power harrow, drill, cambridge roll		
Sowing date:	6 April 1995		
Seed rate:	215 kg/ha		
Seed dressing:	Beret Extra		
Fertiliser:	Triple 15	247kg/ha (37kg/ha N)	3 Apr 95
	5:24:24	240kg/ha (12kg/ha N)	3 Apr 95
	Ammonium nitrate	200kg/ha (67kg/ha N)	27 Apr 95
Trace element:	Manganese sulphate	6.2kg/ha	24 Jun 95
Herbicide:	Harmony M	20g/ha	24 May 95
Fungicides:	None		
PGR:	None		
Insecticides:	None		
Harvest:	16 August 1995		

Appendix 82. 1996 SAC Pathhead, Field: Corselets - Winter wheat 2
Integrated crop details

Crop	Winter wheat
Cultivar	Hunter
Cultivations	Plough, Combi-drill, Cambridge roll
Sowing date	7/10/95
Seed rate	237 kg/ha
Fertiliser	0:131:131kg/ha NPK - 7/11/95
	61:0:30kg/ha NPK - 7/3/96
	71kg/ha N - 17/4/96
	68kg/ha N - 15/5/96
Herbicide	20g/ha'Ally'
	+1.33l/ha'Optica' - 10/5/96
Fungicide	0.625l/ha'SportakDelta'
	+0.3l/ha'Tern' - 27/5/96
	0.33l/ha'Opus'
	+0.5l/ha'Bravo720' - 14/6/96
	*0.2l/ha'Plover' - 7/7/96
	*(Headland only)
PGR	1.2l/ha'AtlasTricol' - 27/5/96
Insecticide	1.16kg/ha'Metarex' - 24/10/95(proportion)
Trace elements	None
Harvest	

Appendix 83. 1996 SAC Pathhead, Field: Richardson's Rig - spring barley
Integrated crop details

Crop	Spring barley
Cultivar	Chariot
Cultivations	Plough, Combi-drill, Cambridge roll
Sowing date	29/3/96
Seed rate	264 kg/ha
Fertiliser	42:42:42kg/ha NPK - 21/3/96
	40:40:40kg/ha NPK - 23/4/96
	20kg/ha N - 25/4/96
Herbicide	30g/ha'HarmonyM' - 16/5/96
Fungicide	0.312l/ha'PunchC' - 7/6/96
PGR	None
Insecticide	None
Trace elements	1kg/ha'Dri-flo 31% Mn' - 16/5/96
Harvest	

Appendix 84. 1996 SAC Pathhead, Field: Under Langlands : Winter wheat 1
Integrated crop details

Crop	Winter wheat
Cultivar	Hunter
Cultivations	Plough, Combi-drill, Cambridge roll
Sowing date	7/10/95
Seed rate	237 kg/ha
Fertiliser	0:131:131kg/ha NPK - 7/11/95
	61:0:30kg/ha NPK - 6/3/96
	71kg/ha N - 17/4/96
	68kg/ha N - 15/5/96
Herbicide	20g/ha'Ally'
	+1.33l/ha'Optica' - 10/5/96
	0.6l/ha'Starane2' - 14/6/96
Fungicide	0.625l/ha'SportakDelta'
	+0.3l/ha'Tern' - 27/5/96
	0.33l/ha'Opus'
	+0.5l/ha'Bravo720' - 14/6/96
PGR	1.2l/ha'AtlasTricol' - 27/5/96
Insecticide	
Harvest	

Appendix 85. 1996 SAC Pathhead, Field: Cottage - Spring oilseed rape
Integrated crop details

Crop	Spring oilseed rape
Cultivar	Aries
Cultivations	Plough, Combi-drill, Cambridge roll
Sowing date	2/4/96
Seed rate	7.5 kg/ha
Fertiliser	42:42:42kg/ha NPK - 21/3/96
	77:0:0:17kg/ha NPKS - 27/5/96
Herbicide	0.5l/ha'ButisanS' - 6/4/96
	3l/ha'Harvest' - 28/8/96
Fungicide	None
Insecticide	0.25l/ha'Decis' - 14/6/96
Harvest	

Appendix 86. 1997 SAC Pathhead, Field: Corselets - spring barley
Integrated crop details

Crop	Spring barley
Cultivar	Chariot
Cultivations	Plough, Combi-drill, Cambridge roll
Sowing date	28/3/97
Seed rate	218 kg/ha
Fertiliser	33:65:65kg/ha NPK - 15/3/97
	81kg/ha N - 18/4/97
Herbicide	40g/ha'HarmonyM' - 24/5/97
Fungicide	0.3l/ha'PunchC' - 10/6/97
PGR	None
Insecticide	None
Trace elements	1kg/ha'Dri-flo Mn' - 24/5/97
Harvest	

Appendix 87. 1997 SAC Pathhead, Field: Richardson's Rig - Spring oilseed rape
Integrated crop details

Crop	Spring oilseed rape
Cultivations	Plough, Combi-drill, Cambridge roll
Cultivar	Superol
Sowing date	1/4/97
Seed rate	6.5 kg/ha
Fertiliser	37:75:75kg/ha NPK - 3/97
	71:0:0:16kg/ha NPKS - 27/5/97
Herbicide	0.5l/ha'ButisanS' - 3/4/97
	3l/ha'Harvest' - 22/8/97
	(*Headland only)
Fungicide	None
Insecticide	0.25l/ha'Decis' - 4/6/97
Harvest	

Appendix 88. 1997 SAC Pathhead, Field: Upper Langlands : Winter wheat
Integrated crop details

Crop	Winter wheat
Cultivations	Plough, Combi-drill, Cambridge roll
Cultivar	Hunter
Sowing date	30/9/96
Seed rate	205 kg/ha
Fertiliser	0:130:130kg/ha NPK - 12/3/97
	68kg/ha N - 31/3/97
	129kg/ha N - 18/4/97
Herbicide	26g/ha'Eagle'
	+1l/ha'Optica' - 11/4/97
	Headland only 1.5l/ha'Roundup360' - 8/97
Fungicide	0.625l/ha'SportakDelta'
	+0.3l/ha'Patrol' - 15/5/97
	0.4l/ha'Opus'
	+0.7l/ha'Bravo500' - 3/6/97
	0.33l/ha'Folicur' - 17/7/97
PGR	1.1l/ha'CCC70%' - 15/5/97
Insecticide	None
Trace elements	None
Harvest	

Appendix 89. 1997 SAC Pathhead, Field: Cottage - Winter wheat 1
Integrated crop details

Crop	Winter wheat
Cultivar	Hunter
Cultivations	Plough, Combi-drill
Sowing date	30/9/96
Seed rate	205 kg/ha
Fertiliser	0:90:90kg/ha NPK - 12/3/97
	68kg/ha N - 12/3/97
	128kg/ha N - 18/4/97
Herbicide	26g/ha'Eagle'
	+1l/ha'Optica' - 11/4/97
	(*0.75ha headland only)
Fungicide	0.6l/ha'Opus'
	+1l/ha'Bravo500'
	+0.25l/ha'Patrol' - 3/6/97
	0.33l/ha'Folicur' - 17/7/97
PGR	1.1l/ha'CCC70%' - 15/5/97
Insecticide	None
Trace elements	3.6kg/ha'Dri-floMn' - 15/5/97
Harvest	