



**PROJECT REPORT No. 198**

**EVALUATION OF  
OPPORTUNITIES FOR  
DISSEMINATION OF  
NATIONAL PEST AND DISEASE  
INFORMATION**

JULY 1999

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# EVALUATION OF OPPORTUNITIES FOR DISSEMINATION OF NATIONAL PEST AND DISEASE INFORMATION

by

G CHAMPION<sup>1</sup>, M MAY<sup>1</sup> AND R HARRINGTON<sup>2</sup>

<sup>1</sup> IACR-Broom's Barn, Higham, Bury St Edmunds, Suffolk IP28 6NP

<sup>2</sup> IACR-Rothamsted, Harpenden, Herts. AL5 2JQ

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## **Executive summary**

- The Rothamsted Insect Survey (RIS) has collected data on aphids for 35 years at eleven sites in England and four in Scotland. It is funded by the BBSRC for fundamental research on aphid population dynamics, and by contracts with industry for applied uses.
- This report contains the responses of a number of organisations to an oral survey on the use that is currently made of the RIS data and whether it was believed that the data had wider use. Suggestions were also solicited as to other survey data which could be useful in relation to other pest and disease problems.
- There was a requirement for the tailored interpretation of the data before it was disseminated.
- The information was considered to be most beneficial if it was targeted at advisers rather than growers. However, information about aphids in sugar beet is already made available to, and appreciated by, growers. The information could be structured to provide a general awareness bulletin for growers and a more detailed interpretation for advisers.
- The recommendation is for an experienced entomologist/pathologist to collate and interpret the data and prepare information for distribution. A range of delivery options should be used. Fax, email and the worldwide web are preferred. This service could (and should) serve as a focus for the collation of a variety of levy board or other available data for growers and advisers. There is a need for such a centre containing impartial information that can be trusted by the industry as a whole. The RIS data could form the basis for this and act as a catalyst to bring a wide range of data and information together.

## Objectives

- A) To evaluate opportunities for greater dissemination of current information on pests and diseases gathered nationwide by the Rothamsted Insect Survey (aphids).
- B) To evaluate opportunities for greater dissemination of current information on pests and diseases gathered nationwide by other organisations.
- C) To locate other potential sources of information.

## Introduction

The Rothamsted Insect Survey (RIS) runs a network of suction traps throughout the UK for monitoring winged aphids. Traps operate at eleven sites in England and a further four in Scotland (Fig. 1). The Scottish trap network is coordinated by the Scottish Agricultural Science Agency at East Craigs. All aphid species are routinely identified and recorded daily throughout the flight period and the data for a range of economically important species are collated and distributed as a weekly bulletin (Table 1). The distributed list mainly comprises agricultural aphid pests of crops such as cereals and oilseed rape. Although previously widely distributed, the weekly bulletin is now limited largely to contributors to the survey work and a few other groups on a reciprocal basis. In addition, funding sources mean that it includes little in the way of interpretation of results.

Table 1 Aphid bulletin species list for 1998

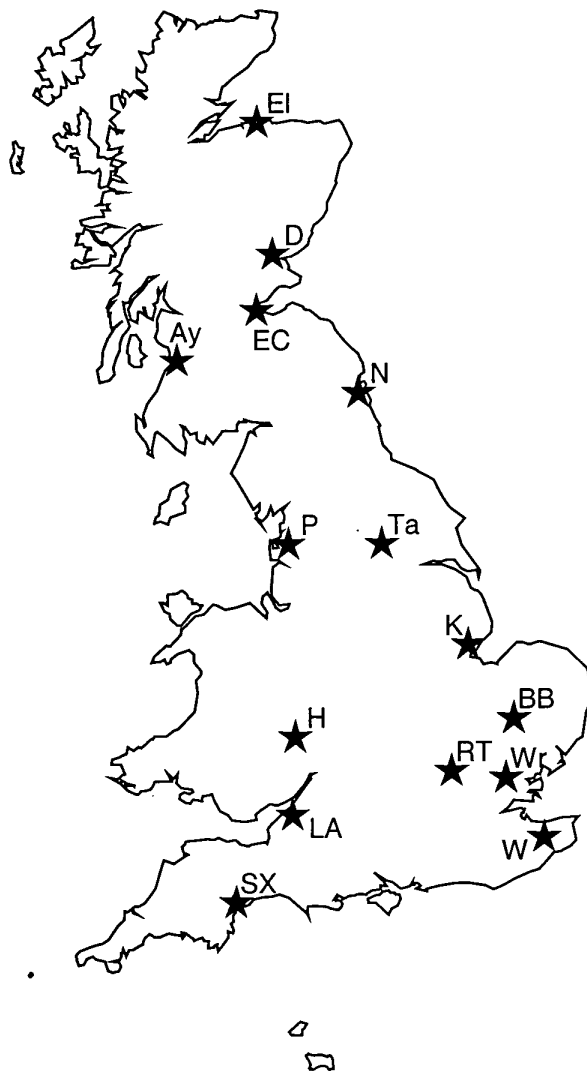
Scientific name	Common name
<i>Acyrtosiphon pisum</i>	Pea aphid
<i>Aphis fabae</i> grp	Black bean aphid
<i>Aulacorthum solani</i>	Glasshouse and potato aphid
<i>Brachycaudus helichrysi</i>	Leaf-curling plum aphid
<i>Brevicoryne brassicae</i>	Cabbage aphid
<i>Cavariella aegopodii</i>	Willow-carrot aphid
<i>Drepanosiphum platanoidis</i>	Sycamore aphid
<i>Elatobium abietinum</i>	Green spruce aphid
<i>Hyalopterus pruni</i>	Mealy plum aphid
<i>Hyperomyzus lactucae</i>	Currant- sowthistle aphid
<i>Macrosiphum euphorbiae</i>	Potato aphid
<i>Metopolophium dirhodum</i>	Rose-grain aphid
<i>Myzus ascalonicus</i>	Shallot aphid
<i>Myzus persicae</i> grp	Peach-potato aphid
<i>Nasonovia ribisnigri</i>	Currant-lettuce aphid
<i>Phorodon humuli</i>	Damson-hop aphid
<i>Rhopalosiphum insertum</i>	Apple-grass aphid
<i>Rhopalosiphum maidis</i>	Cereal leaf aphid
<i>Rhopalosiphum padi</i>	Bird cherry-oat aphid
<i>Sitobion avenae</i>	Grain aphid
<i>Sitobion fragariae</i>	Blackberry-cereal aphid

These data are used in many fundamental, strategic and applied projects. Examples of applied uses include :

- a. the Sugar Beet Research and Education Fund (via Broom's Barn), who forecast and advise on the control of the aphid vectors which carry beet yellows viruses (Fig. 2);
- b. under HGCA grant 0021/1/95, to initialise a prototype model of the secondary spread of BYDV for advice on the need to control the aphid vectors in autumn-sown cereals;
- c. on a regional basis, to warn of the arrival of key aphid pests in spring and early summer when control would have a yield benefit.

The aphid trapping system was described to farmers attending an ARIA (Arable Research Institute Association) meeting at Rothamsted in 1998 and there was a strong request from the farmers that such data be made available to them throughout the growing season. The interest shown at that meeting has prompted this project.

**Figure 1 Location of RIS suction traps**



Indicates suction trap sites which are:

EI	<u>Elgin</u>	BB	Broom's Barn
D	Dundee	H	Hereford
EC	East Craigs	RT	Rothamsted Tower
Ay	Ayr	Wr	Writtle
N	Newcastle	LA	Long Ashton
Ta	Tadcaster	W	Wye
P	Preston	SX	Starcross
K	Kirton		

Figure 2 Example of Broom's Barn aphid forecast bulletin



**IACR-Broom's Barn**

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**SBREF / BROOM'S BARN ADVISORY FAX LINE**

FAX 4 – 31 MARCH 1999  
(2 pages)

FAX: 01284 811191

**Drilling**

The stop go situation has improved a little in most areas. Some growers have finished, others of us with wet soils are having to proceed slowly and with caution so that we do not damage and compact seedbeds. Many fields that have been drilled appear to have deep wheelings left by the drill tractor.

**Fertiliser and herbicide applications**

Whenever possible, use low ground pressures to reduce the risk of compaction on wet soils. This will be easier to achieve in tramlined compared to conventionally drilled crops.

**Mice**

These are likely to be problem in crops where the seed furrow has not been fully covered.

**Slugs**

Slug damage is being reported in many spring sown crops this year. Whilst we have not received any reports of severe problems in sugar beet, continue to use monitoring traps in fields at risk.

**Leatherjackets**

We have been asked to clarify the situation regarding tests for these. Our comments about lack of accuracy referred to cultivated sugar beet fields and not undisturbed soil, such as grass leys, in which the tests are more accurate.

**Aphids**

The first *Myzus persicae* was caught in the Writtle suction trap during the week beginning 15<sup>th</sup> March. No further catches of this species were made last week (week beginning 22<sup>nd</sup>) but one *Macrosiphum euphorbiae* was caught, again in the Writtle trap. This tends to confirm the forecast that aphid numbers, but not necessarily the virus levels, are likely to be high this season. We will keep you informed regarding virus risk as the season progresses.



## Methodology

A number of organisations across agriculture, horticulture and fruit growing were approached and questioned and then surveyed by telephone. The organisations were chosen because of their known interest in providing information direct to growers. Some chemical companies have made independent enquiries about possible use of RIS data. The questions asked were as follows:

- a) Are you familiar with and do you use the Rothamsted Insect Survey (RIS)?
- b) Do you collect comparable pest or disease information and would you make it available for wider circulation?
- c) To whom is it available, how is it paid for and how is it distributed?
- d) Is there any information of this type which you do not have but would like?
- e) If more information was available to you would you be in a position to consider distributing it with your existing datasets to existing customers?

The organisations approached were;

ADAS Boxworth  
ADAS Wolverhampton  
Apple and Pear Research Council  
Arable Research Centres  
British Potato Council  
FRAG  
Harper Adams Agricultural College  
Horticultural Development Council  
HRI East Malling  
Independent consultant  
Morley Research Centre  
NIAB  
PGRO  
WRAG

Summaries of the responses are presented in the following section and more detailed responses to the questions outlined above are presented in Appendix 1.

## Summary of responses

It is important to remember that the organisations approached differ in their roles and their closeness to the producers and advisers involved at the farm level. Hence the responses cannot be treated with equal weight. The responses termed “negative” come from organisations to which RIS data are not relevant.

Positive responses have been received from ADAS Wolverhampton, Harper Adams Agricultural College, HDC, NIAB and Morley Research Centre. All have suggestions as to how the value of the information could be enhanced. Suggestions include: faster turn around time from collection to data receipt, and interpolation between fairly widely dispersed traps. A number of concerns were expressed about the applicability of trap data to the development of problems in the field. Two of the organisations felt it more useful to target this information to advisers than to growers.

Although not approached officially the Association of Independent Crop Consultants, along with other such advisers, would find access to this information to be highly valuable. Targeting information to advisers could reduce the work and costs involved in the distribution process.

Four other organisations (HRI East Malling, PGRO, ADAS Boxworth and Arable Research Centres) indicated that they would be more interested in this type of data if it could be extended in some way such as the inclusion of species affecting fruit crops, trapping nearer the ground, detecting the virus load of the aphids or including disease forecasts. Despite seeking other comparable information from the respondents few other datasets were found during this exercise. The majority of other survey work is commercially commissioned.

Further information could be useful for the following species:

- moth data, for example silver Y moth - to warn of invasions of migrants
- noctuid moth data – to warn of cutworm larvae
- pea moth
- frit fly
- wheat bulb fly
- leatherjackets
- slugs
- pea and bean weevils
- bruchids
- pests of potatoes (especially if crops are for seed)
- pests of horticultural crops
- pests of fruit crops

### **Responses to concerns**

Many of the requests in relation to the RIS data are technically feasible. For example, beet mild yellowing virus and beet yellows closterovirus are routinely monitored in individual vector aphids and this would be possible for other luteoviruses. Trapping aphids at lower levels (1.54m) is done at Rothamsted but will not be possible as a routine elsewhere. However, relationships between samples at 12.2m and 1.54m at Rothamsted may be relevant elsewhere. Direct relationships between trap samples and crop infestations have been derived for only a few aphid species, but are not always important for advisory purposes. It is often sufficient to forecast when, and later confirm that, aphids of a particular species are on the wing and potentially able to colonise crops. Counts of aphids from 12.2m suction trap samples are highly correlated for distances up to 80km apart.

Experience at Broom's Barn with the virus yellows spray warning scheme has shown that, whilst advisers are often able to make the best use of the information on aphid abundance to make on-farm decisions, grower awareness of problems is also important. Sugar beet growers are warned whether risks are low, intermediate or high. A message suggesting low risks avoids unnecessary inputs. A high risk warning can help to ensure that crops are protected whilst, when risks are variable or intermediate, growers and advisers usually link together to analyse the on-farm situation.

## Distribution

Distribution of this information could utilise a number of media in parallel. Options include:

- a) Press releases aimed at the farming press. This would ensure very wide distribution, but would probably be edited to contain main highlights. This would rely heavily on the value of the interpretation of the data since copy space is certain to be limited. However, it is likely that a specific column or report space could be made available by some of the farming magazines. This method would be too slow for most decision making.
- b) Mailing using conventional post. This is likely to be the most expensive and time-consuming medium. It would also be too slow for some decisions.
- c) Faxing using an automated, computer based system such as Zetafax. This method is used already at Broom's Barn and was used by Morley Research Centre when an information system was first developed there. Costs for this system are probably intermediate between options b and d. There would be high initial costs for software and low to zero maintenance costs. Once the bulletin was prepared a fax based system would require little follow-up attention and has the advantage of giving rapid delivery. However, a continual problem is ensuring that lists of fax numbers are kept up to date, and this is in the hands, usually, of the recipients.

Fax polling is an option offered at Broom's Barn and is popular with certain growers and advisers who prefer to seek rather than be sent information.

E-mail is another option for many advisers and a rapidly increasing number of farmers. In 1997, Broom's Barn had only three people requesting information by e-mail instead of fax. During 1998, this increased to over 200 people using e-mail.

It is also possible to use faxes and e-mails together (ie as a choice for the recipient) since the same electronic information can be delivered as both faxes or emails.

- d) Placing on the World Wide Web. Development of a dedicated site such as a joint levy boards pest and disease information site would appear most appropriate. This could be coupled by links to other sites (see Appendix 2 for the home pages for the British Potato Council, the PGRO and Broom's Barn) or from sites (eg commercial sites such as those of Cyanamid, Novartis etc or other open sites such as the SBREF one at Broom's Barn). The WWW has the advantage of speed of delivery and ease of update but demands that people seeking information are proactive in obtaining it. Distribution via a WWW site would not be restricted to advisers. Although many respondents thought it better to target advisers, it is likely that many of the more technically aware growers could also benefit from the receipt of this information. Costs may include renting space on a WWW server. Information within the site could appear in layers, with the simplest and broadest information on the top pages, with hypertext links to more specialised information. Web systems can be very flexible and could be designed so that

people desiring information could request an automatic e-mail once the pages are updated. This could serve as a refined version of option c.

- e) If an appropriate format is used, one report can be used to cover all of these options (a-d).

Advertising of these services could be achieved in a number of ways, including introductory and update articles in the farming press.

### **Recommendations**

- An experienced entomologist/pathologist should be appointed.
- Their role would be to interpret the trap data and then produce a weekly bulletin which may vary in length through the season but which should ideally be 2-3 pages long.
- Use e-mail or fax for general distribution of the bulletin.
- If the need was identified, create a WWW site, with appropriate sections password protected.
- Encourage other data/ information to be offered for inclusion on the WWW site either from other levy boards or publicly funded data.

## Appendix 1

### Responses to the telephone survey

The responses can be broadly divided into four categories:

- a. positive (thought that current information was of value to their organisation) – the most usual answer;
- b. would be interested in the data if the dataset could be extended (to include different species and/or to include indications of virus load/infectivity);
- c. neutral;
- d. negative (their organisation would not be interested in the data).

#### a. Positive responses

##### 1. ADAS Wolverhampton (Bill Parker)

ADAS use RIS data as a guide to their advisers. Interpolation is required because of the distance separating the traps and more specific spatial information is gained through their own advisers. If it was supplemented with an interpretation of data it would become more useful. In the present system, RIS information may arrive one or two weeks after the collection time. The usefulness of this information for making real time decisions could be improved if it were available more quickly.

Other information which ADAS gather is usually generated for commercial clients and this would not be available. It might be possible in some circumstances to share information in a diluted form, and this has appeared in ADAS bulletins in local areas.

Other information which might be of use includes moth data in order to warn of invasions of migrants.

##### 2. Horticultural Development Council (Sarah Ball)

The HDC general position is supportive, but it feels that information of this type would be best targeted to advisers rather than to growers direct. HDC has an existing distribution system and information could be included in its newsletter which is sent directly to all growers. The feasibility of this will depend on the final format of the information.

The issue of possible funding for wider dissemination of relevant information was raised at a joint meeting of the levy boards in March. Feedback from this meeting indicates that HDC are supportive of the idea. HGCA will co-ordinate the levy boards' position on this.

##### 3. National Institute of Agricultural Botany (Jeremy Sweet)

NIAB is aware of the RIS data and believes that good use is made of the information on sugar beet already through the network of contacts from

Broom's Barn. Other crops are more problematic; relationships between aphids and disease are still not clearly established for example for BYDV in cereals and beet western yellows virus in oilseed rape. The trap data are interesting but often not necessary for forecasting which relies more on weather data. The most important time for its use is when aphids are scarce and growers may be considering not spraying, but this can be a risky strategy, and many will still opt to spray. The best target for these data would be advisers since the trap data serve as a reminder or prompt for problems which can then be checked for locally.

Advice on aphids in seed potatoes and horticultural crops would be of use, although in the former case it is likely that if growers were spraying for blight they would tank-mix an aphicide as a routine.

#### 4. Harper Adams Agricultural College

(Pat Haydock, Nematologist)

RIS data were useful when in a previous role as the entomologist at HAAC. The information used was largely the virus yellows forecast generated by Broom's Barn. Since his role has reverted back to nematology he no longer uses RIS data (see comments from the HAAC entomologist Tess Grasswitz).

Suggestions for other information of interest;

Frit fly (which is available from ADAS)

Wheat bulb fly

Noctuid moths (larvae are cutworms)

(Tess Grasswitz, Entomologist)

She has never seen the RIS information and was unable to answer questions.

HAAC do not carry out trapping but it would be useful to have information such as that provided by the RIS. She can see the potential for information such as this to be used by farmers.

She would like to see the range of data this survey gives to understand its limits and think of its relevance to HAAC. Copies of an old bulletin from 1998 have been sent.

#### 5. Morley Research Centre (Doug Stevens)

Morley would find the RIS data useful and it would be used by their own advisers and their adviser and farmer members. They already distribute advisory information of their own via a fax line to members. This includes information such as cereal growth stages. However, this information is not available for use by others.

## **b. Interested if information extended**

### **6. Horticulture Research International East Malling (Jerry Cross)**

Although they receive the RIS bulletin, of the species covered only two are relevant to HRI and these species attack fruit and hops. They would be more interested if the species range was enlarged to cover more fruit/horticultural species.

HRI do not do their own surveying, except for occasional specialised projects (eg rosy apple aphid and pear bedstraw aphid).

### **7. Processors and Growers Research Organisation (Anthony Biddle)**

Although used in the past, RIS data have not been used since the distribution list became restricted. PGRO interest is limited to two species. Also, PGRO have concerns that because the suction traps are at 12 m and the relationships between the trapping samples and the development of crop problems have not been established for the species of interest to them. PGRO would be more interested if the trapping could be undertaken at low level.

Other pests of interest:

other aphid species;

bruchids (some development work has been undertaken on trap designs with

Lesley Smart at RES but they are still looking for attractants);

pea and bean weevil (a commercial system is now available from Agrolan

Ltd, Swindon based on pheromone system developed by RES);

Silver Y moth (system offered by Agrolan);

Pea moth (traps have been available for many years).

Major pests for which trapping systems are not available include slugs and leatherjackets. PGRO are working on trap development.

Where commercial tests are available, PGRO leave monitoring to the growers. However, other information is gathered and this is presented on their web site (see home page in Appendix 1). These data are not comprehensive and were not offered for inclusion with RIS data.

### **8. ADAS Boxworth (John Garstang)**

RIS data are used in the creation of crop notes. The greatest problem and difficulty is the interpolation needed between the sites of the suction traps and the location of advisers. ADAS would be more interested if it was possible to detect virus load / infectivity. However, the relationship between virus load in aphids in spring and the impact on spring crops seems still to be open to debate. He believed that the importance of this has been underestimated and the area needs further work.

ADAS undertake surveys for private clients on wheat bulb fly, leatherjackets and frit fly but the results are confidential.

## 9. Arable Research Centres (Nick Poole)

Advice of this type might be too specialised for targeting to growers. Often, since the cost of aphid sprays in the autumn is low, if there is any doubt they will adopt the insurance approach. It would be of more interest and value to advisers / consultancy firms etc. where the data can be considered in a broader context. As an organisation they would like to receive it. In the future it might be of more value, for example if sprays are restricted by heavy taxes or where interests favour organic or integrated/low input systems. Problems associated with its use include the degree of interpolation necessary between trap locations; although the data are generated regionally there are sufficient gaps between trapping sites to cause doubts about general applicability.

ARC would also be more interested if other services such as disease forecasting could be included. He mentioned that during an autumn meeting at Rothamsted, Bruce Fitt reported on a disease forecasting system for stem canker and light leaf spot. Discussions with Bruce Fitt suggested that forecasting is being undertaken. The HGCA is funding this work with MAFF and they would control its distribution. Likely routes would be press releases from the HGCA and posting on the Rothamsted web site.

### c. Neutral

## 10. Weed Resistance Action Group (Steven Moss, Rothamsted)

WRAG would be able to provide general and long term advice on weed resistance. Weekly/monthly bulletins would be too big a drain on WRAG staff. (Recently Jim Orson has produced weekly/frequent tips in Farmers Weekly for weed resistance management, but this type of advice would not need repeating too often.)

## 11. British Potato Council (Mike Storey)

He is aware of RIS data in and looks at the sugar beet bulletins. The same species are relevant to potato crops, especially in relation to forecasting the timing and size of spring migrations. However, suitable interpretation of data is required for it to be useful to potato growers. Seed growers would benefit more from more localised information on aphid incidence.

BPC does not have any comparable pest and disease data for dissemination but has a commission with Cambridge University Farms and CSL in relation to aphid biology and its relation to burndown in potatoes. They also have a SAPPPIO link project on aphid resistance to insecticides with Alan Devonshire at Rothamsted.

(Steve Gowry)

Steve Gowry was familiar with the aphid trapping survey but the British Potato Council doesn't use it. The BPC has launched a web site (see home page printed



in Appendix 2) and would be willing to post links to any web pages which might be developed to contain the RIS data. Subscribers to the BPC receive the bulletin "Eyewitness" and a technical item could be submitted for publication. Growers also receive mailings from the BPC and if required these could include either a questionnaire on use of the RIS data or advertising material to alert growers to the information available and how to obtain it. Mailings could be done in one of two ways; either BPC would supply a complete list of producers or, to target large producers only, BPC would be willing to undertake the mailing process.

**d. Negative**

12. Fungicide Resistance Action Group (Chris Furke)

FRAG's role does not involve handling data. Their role is to act as a link between academia and growers and to cascade advice to the growers through guide books on the measures to avoid problems in specific crops.

13. Apple and Pear Research Council (Malcolm Ronald)

APRC's aim is to commission and publish research and not to inform the growers. They are not involved in advisory activities. Opportunities for dissemination of information are limited since they do not have a web site and their newsletter is only published 2/3 times per year.

**Appendix 2**

**WWW home pages of potential link sites**



# IACR-Broom's Barn



Director : *Dr John D Pidgeon*

## Sugar Beet Research and Information

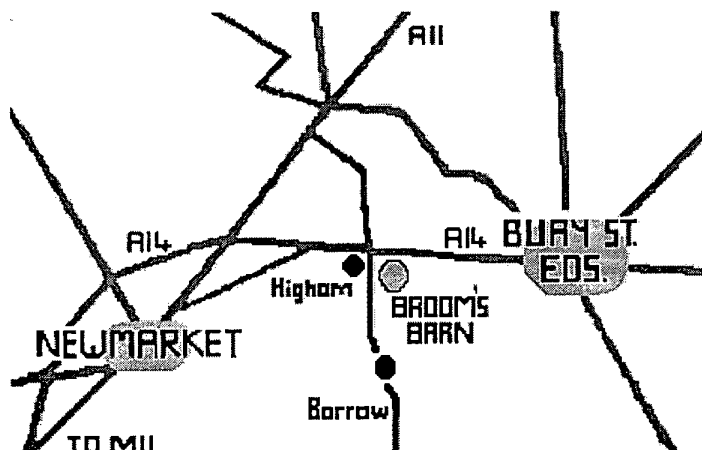
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- ◆ [Information for Growers](#) latest bulletin 3/3/99
- ◆ [Pests and Diseases](#) latest bulletin 3/3/99
- ◆ [Plant Clinic picture gallery](#) last update 27/2/99
- ◆ [What's On](#)
- ◆ [Job Vacancies](#)
- ◆ [Weather](#)
- ◆ [Links to other sites](#)
- ◆ [Areas of Research](#)
- ◆ [Who's Who \(Scientific Staff\)](#)



IACR-Broom's Barn is one of three sites within the Institute of Arable Crops Research. It is Europe's largest sugar-beet research centre and the main source of research and education for British sugar-beet growers. It is financed principally by winning contracts from the Sugar Beet Research and Education Committee, but also receives some funding through grants from MAFF, BBSRC, DETR, EU and commercial companies

### How to find us



### Address for correspondence

*IACR-Broom's Barn  
Higham,  
Bury St. Edmunds,  
Suffolk,  
IP28 6NP.  
United Kingdom.*

*Tel: +44 (0)1284 812200  
Fax: +44 (0)1284 811191*



# Processors and Growers Research Organisation



**The Processors and  
Growers Research  
Organisation(PGRO) is the  
UK centre for applied  
research on temperate peas  
and beans:**




**The Research Station, Great North Road  
Thornhaugh, Peterborough PE8 6HJ  
England.**

**Tel + 44(0) 1780 782585**

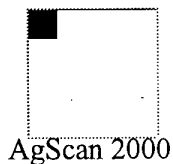
**Fax + 44(0) 1780 783993**



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by Jim Young a  
member of



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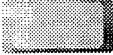


THE BPC IS A  
DEVELOPMENT COUNCIL FOR THE  
BRITISH POTATO INDUSTRY

  
**WHY**  
was it established

  
**WHO**  
does it represent

  
**WHAT**  
does it do

  
**HOW**  
is it funded

  
**ABOUT**  
this web site