

PHYSIOLOGIC RACE SURVEYS

FINAL REPORT

1967

NOT FOR PUBLICATION

I N D E X

<u>CODE</u>		<u>PAGE</u>
	Introduction	1
A	Yellow rust - Wheat (<i>Puccinia striiformis</i>) ..	2
B	Yellow rust - Barley (<i>Puccinia striiformis</i>) ..	12
C	Crown rust - Oats (<i>Puccinia coronata</i>) ..	13
D	Mildew - Wheat (<i>Erysiphe graminis - tritici</i>) ..	15
E	Mildew - Barley (<i>Erysiphe graminis - hordei</i>) ..	18
F	Mildew - Oats (<i>Erysiphe graminis - avenae</i>) ..	22
G	Rhynchosporium - barley (<i>Rhynchosporium secalis</i>) ..	24
H	Leaf spot - Oats (<i>Drechslera avenae</i>) ..	28
	Final summary	29
Appendix		
	European Barley Committee Report 1968	1

PHYSIOLOGIC RACE SURVEYS FINAL REPORT FOR 1967

Introduction

1967 was the first year during which surveys of the major cereal pathogens for physiologic races was co-ordinated throughout the British Isles. Previous to 1967 individual research centres had conducted private surveys. However, it was agreed that the occurrence of new physiologic races was of major importance and should be reported as early as possible, to enable plant breeders to produce new resistant varieties and for testing of existing varieties to be undertaken with the new race.

Diseases and pathogens which were included in the survey for 1967 were:- yellow rust of wheat and barley; mildew of wheat, barley and oats; Rhynchosporium leaf blotch of barley; leaf spot of oats and crown rust of oats. Five centres agreed to identify races of these pathogens:- the National Institute of Agricultural Botany, Cambridge, the Plant Breeding Institute, Cambridge, the Welsh Plant Breeding Station, Aberystwyth, the University of Reading and the Department of Agriculture for Scotland, East Craigs, Edinburgh.

Disease samples were collected by many participants from many localities in the British Isles and we are grateful for the co-operation shown during the year. Table 1 indicates the numbers of samples collected for each disease.

Table 1

Disease	No. of Samples
Yellow rust - wheat	343
Yellow rust - barley	48
Crown rust - oats	17
Mildew - wheat	122
Mildew - barley	173
Mildew - oats	42
Rhynchosporium - barley	227
Leaf spot - oats	62
TOTAL	1034

This report shows the completed results of race identification conducted during 1967. The presentation of results of each pathogen is separated into five sections:-

1. The total number of samples received.
2. The varieties from which samples were collected.
3. The localities from which each of the samples were collected.
4. Race identification
5. Summary.

Each of the five centres has provided information on the pathogens which are being surveyed for physiologic races. No further testing of the 1967 samples is contemplated.

A.

Yellow Rust - Wheat

National Institute of Agricultural Botany

N.H. Chamberlain

1. A total of 343 samples of wheat yellow rust was received by the N.I.A.B.

2. Varieties from which samples were received.
Winter wheat varieties are given in Table 2, spring wheat varieties in Table 3.

Table 2

Winter wheat variety	No. of samples
Cappelle-Desprez	63
Champain	39
Rothwell Senator	23
Rothwell Perdix	18
Hybrid 46	13
Joss Cambier	12
Mildress	12
Trident	9
Tetrix	5
Maris Ranger	5
Apex	5
Elite Lepeuple	5
Brittania	5
Viking	4
West Desprez	4
Milfast	3
Flamingo	3
Maris Widgeon	3
Cama	2
FDA.15	2
Maris Totem	2
Margin	2
Maris Beacon	1
Maris Teal	1
TB 396/37	1
Aegilops 806	1
Belloy C95/58	1
Heines VII	1
Cleo	1
Manitoba Bearded wheat	1
T.vulgare	1
TOTAL	244

Table 3

Spring wheat variety	No. of samples
Kloka	20
Kolibri	11
Rothwell Sprite	11
Opal	8
Koga II	7
Sirius	6
Svenno	5
Janus	5
Ardent	5
Troll	4
Clarion	4
Caesar	2
Capitole	2
Jufy I	2
MCH 6264	2
Maris Ensign	1
Parlo	1
Petkus 71/64	1
Quern	1
W.9248	1
TOTAL	99

5. Localities from which the wheat yellow rust samples were collected

Samples were collected from 127 localities in the British Isles. The locality from which each sample was collected and the variety from which it was collected are shown in Table 4.

Table 4

Locality	Source Variety	No. of samples
Abergavenny (Monmouth)	Mildress	1
Aberlady (E. Lothian)	Rothwell Perdix	1
Aberystwyth (Cardigan)	Rothwell Sprite (2), Rothwell Perdix, Svenno, Koga II, Kloka Clarion, Opal	8
Arthurstown (Co. Louth, Eire)	Cappelle Desprez	1
Aston Tirrold (Oxon)	Cappelle Desprez (2), Tetriz Mildress, Joss Cambier, West Desprez, Rothwell Senator, Hybrid 46, Champlain	9
Beckweston (Co. Kildare, Eire)	Quern, Trident, Parlo	3
Barton in Needwood (Staffs)	Cappelle Desprez	1
Beaumaris (Anglesey)	Rothwell Perdix	1
Boghall (Edinburgh)	Kolibri, Maris Totem	2
Bourne (Lincs)	Cappelle	1
Boston (Lincs.)	Hybrid 46, Britannia	3
Brackley (Northants)	Cappelle-Desprez	1
Bradfield St. George (Suffolk)	Maris Widgeon	2
Brecon	Rothwell Senator, Cappelle Desprez	1
Bridgets E.H.F. (Winchester, Hants)	Champlain	1
Buckland Dinham (Somerset)	Cappelle Desprez	2
Cerne Abbas (Dorset)	Kloka, Champlain	1
Charlton (Oxon)	Champlain	1
Chester	Mildress, Troll, Kolibri	3
Chisleton (Wilts)	Champlain	1
Clifford (Hereford)	Cappelle Desprez, Champlain	2
Cockle Park (Worcester Northumberland)	Elite Lepeuple (2), Champlain Maris Ranger, Cappelle Desprez Hybrid 46, Troll, Maris Teal, Rothwell Sprite, Ardent, Joss Cambier, Kolibri, Sirius, Caesar, Janus, Kloka, Koga II Opal, Clarion, Cleo	21
Coldstream (Berwickshire)	Cappelle Desprez	1
Conon Bridge (Ross & Cromarty)	Rothwell Perlux	1
Denton (Northants)	Cappelle Desprez	1
Devizes (Wilts)	Cappelle Desprez	1
Devon	Champlain July I, Trident	3
Dorset	Champlain (2), Cappelle Desprez	3
Downton (Wilts)	Maris Widgeon	1
East Craigs (Edinburgh)	Mildress, Svenno, Kolibri Caesar, Rothwell Sprite, Koga II, Trident	7
East Lothian	Rothwell Perdix, Cappelle Desprez, Manitoba Bearded Wheat	3
Eastville (Lincs.)	Tetriz	1
East Wemyss (Fife)	Cappelle-Desprez	1
Edinburgh	Milfast, Flamingo, Maris Totem	3
Elford (Staffs)	Rothwell Perdix	1
Farndon (Cheshire)	Joss Cambier	1
Fife	Rothwell Perdix, Cappelle-Desprez, Rothwell Senator, Capitole	4
Findon (Ross & Cromarty)	Rothwell Perdix	1
Forfar (Angus)	Rothwell Senator, Cappelle Desprez, Mildress, Joss Cambier	4

Locality	Source Variety	No. of samples
Glamorgan	Hybrid 46	1
Gosberton (Lincs.)	Kloka	1
Great Barton (Surrey)	Cappelle Desprez	1
Hacombe (Devon)	Trident	1
Haddington (E.Loathian)	Cappelle Desprez, Mildress	3
	Joss Cambier	
Hampshire	Cappelle Desprez	1
Hanbury (Worcs.)	Cappelle Desprez (2)	2
Harper Adams (Newport, Shropshire)	Elite Lepeuple, Clarion	3
	Cappelle Desprez	
Headley Hall (Tadcaster, Yorks)	Troll, Janus, Ardent,	18
	Trident, Cappelle-Desprez,	
	Margin, Opal, Sirius, Kloka,	
	MGH.6264, Kolibri, Clarion	
	W.9248, Rothwell Sprite,	
	Milfast, Heines VII, Viking,	
	Elite Lepeuple	
Hereford	Cappelle Desprez, Champlain	3
	Rothwell Senator	
High Mowthorpe (Yorks.)	Rothwell Senator	1
Hockwold (Norfolk)	Rothwell Sprite	1
Holbeach (Lincs.)	Apex, Cappelle Desprez	2
Kelvedon (Essex)	Trident	1
Kent	Cappelle Desprez	1
Kincairdineshire	Rothwell Perdix	1
King's Lynn (Norfolk)	Hybrid 46 (3), Cappelle	4
	Desprez,	
Kinver (Staffs)	Svenno, FDA.15	2
Kirton (Lincs)	Apex, Hybrid 46, Champlain,	4
	Brittania	
Lincoln	Apex	1
Lincolnshire	Cappelle Desprez	1
Llanarth (Monmouth)	Trident	1
Llantwit Major (Glamorgan)	Tetrix, Champlain, Rothwell	5
	Senator, West Desprez	
Long Parish (Hants)	Cappelle Desprez	
	Rothwell Perdix (3)	4
	Cappelle Desprez	
Lynington (Hants)	Rothwell Perdix	1
Marholme (Huntingdon)	Koga II	1
Marlborough (Wilts)	Cappelle Desprez	1
Martboard (Wilts)	Opal	1
Midlothian	Mildress, Cappelle Desprez	6
	Joss Cambier, Rothwell	
	Perdix, Flemingo, Rothwell	
	Senator	
Minehead (Somerset)	Cappelle Desprez	1
Moelfre (Anglesey)	Champlain	1
Monmouth	Kloka, Cappelle Desprez	2
Newleake (Lincs.)	Cappelle Desprez	1
Newport Pagnell (Bucks)	Rothwell Senator	1
N.I.A.B. (Cambridge)	Mildress (2), Triticum vulgare	6
	Maris Ranger, Cama, Joss	
	Cambier	
Norfolk	Cappelle Desprez, Kloka	2
Normanton (Rutland)	Cappelle Desprez	1
Northamptonshire	Champlain	1
North Berwick (E.Loathian)	Rothwell Senator, Cappelle	2
	Desprez	
Penkridge (Staffs)	Rothwell Perdix, Cappelle	2
	Desprez	
Pewsey (Wilts)	Cappelle Desprez, Champlain	2
Ratho (Midlothian)	Joss Cambier, Mildress	5
	Capitole, Rothwell Senator	
	Cappelle-Desprez	
Reading (Berks)	Champlain, Rothwell Perdix	5
	Rothwell Senator	

Table 4. Continued.

Locality	Source Variety	No. of Samples
Redbourn (Herts)	Cappelle Desprez	1
Rosemaund (Hereford)	Champlein, Rothwell Perdix	15
	Hybrid 46, Cappelle	
	Desprez, Rothwell Senator	
	Opal, Rothwell Sprite,	
	Svenno, Jufy I, Kloka,	
	Koga II, Kolibri, Trident,	
	Janus, Maris Ensign	
Rothamsted (Harpenden, Herts)	Champlein	1
Roundway Farm	Cappelle Desprez	1
Rorton (Beds)	Champlein, Rothwell	
	Senator, Tetrix,	
	Apex	
St. Ives (Cambs.)	Rothwell Perdix, Mildress	1
Scone (Perthshire)	Joss Cambier, Cappelle	5
	Desprez, Rothwell Senator	
Seale-Hayne (Newton Abbot, Devon)	Champlein	1
SavernStokes (Worcs.)	Rothwell Senator	1
Sheldon (Durham)	Rothwell Senator	1
Shepton Mallet (Somerset)	Cappelle Desprez	1
Shinfield (Berks)	Aegilops 806	1
Shrewsbury (Shropshire)	Rothwell Senator, Tetrix	2
Shropshire	Cappelle Desprez	1
Sleaford (Lincs.)	Cappelle Desprez	1
Somerset	Champlein	1
Spalding (Lincs.)	West Desprez, Joss Cambier	4
	Mildress, Maris Ranger	
Sparsholt (Wulchester, Hants)	Kloka (4), Viking, Rothwell	17
	Senator, Beiloy C.98/58,	
	Trident, Rothwell Sprite,	
	Janus, Kolibri, Opal,	
	Sirius, Maris Beacon, Joss	
	Cambier, TB.396/37,	
	Petkus 7/64	
Sprowston (Wymondham, Norfolk)	Cappelle Desprez, Champlein	6
	Rothwell Perdix, Rothwell	
	Senator, Viking, Joss	
	Cambier	
Stogursey (Somerset)	Champlein, Cappelle Desprez	2
Stoneleigh (Warwickshire)	Rothwell Senator	1
Stourbridge (Worcs.)	Champlein	1
Stowey (Somerset)	Rothwell Sprite	1
Sutton Bonington (Loughborough	Kolibri, Kloka, Koga II,	
Leics.)	Ardent, Rothwell Sprite,	7
	Sirius, Svenno, Kloka,	
	Flamingo	
Taunton, (Somerset)	Champlein	1
Teffont (Wilts)	Hybrid 46, Viking, Troll,	1
Terrington E.H.F. (King's Lynn,	MGH.6264, Kloka, Milfast	6
Norfolk)	Champlein. Apex	
Theale (Berks)	Champlein, Kloka, Cappelle	2
Thorney (Cambs.)	Desprez	3
	Hybrid 46, Champlein	
Tisbury (Wilts)	Cappelle Desprez, Champlein	2
Upton Grey (Hants)	Kloka, Opal	2
Welby (Lincs.)	Maris Ranger	2
Whittlesey (Cambs.)	Opal	1
Wiltshire	Hybrid 46, Cappelle Desprez	1
Winnarleigh (Preston, Lancs)	Champlein, Rothwell Senator	11
	Elite Lepaule, Kolibri,	
	Kloka, Rothwell Sprite,	
	Ardent, Sirius, Koga II	
	Cappelle Desprez, Rothwell	
Wingfield (Wilts)	Senator	2
Wisbech (Cambs)	Cappelle Desprez	
Syerscole (Staffs)	Kloka	1

Locality	Source Variety	No. of Samples
Witcham (Essex)	Kloka, Champlein, Cappelle Desprez	3
Wolverhampton (Staffs)	Cappelle Desprez	1
Worcestershire	Champlein	1
Wye (Ashford, Kent)	Champlein (2), Kolibri (2), Brittania (2), Ardent, Kloka, Sirius, Cappelle Desprez, Hybrid 46, Maris Ranger, Camé, Janus, Champlein, Cappelle Desprez	14
Yattendon (Berks)	Cappelle Desprez	2
Yeovil (Somerset)	Cappelle Desprez	1
Yorkshire	Cappelle Desprez (2)	2
TOTAL		343

4. Race identification

93 of the samples received by N.I.A.B. failed to produce spores because they were in poor condition on arrival. This was due to delays in the post and the fact that many samples were wrapped in a polythene bag rather than a succulent leaf. Manitoba Bearded wheat and Aegilops 806 have not been tested as seed was not available. The remaining 248 isolates have been tested, some on the full set of differentials. The results are shown in Table 5.

Table 5

NIAB No.	Date	Source of Isolate			Race	Comments
		Place	Variety			
67/1	12/66	N.I.A.B. Trial Ground	T.V. pp. Line 1		3/55	
67/5	20/4/67	Dorset	Champlein		3/55	
67/6	20/4/67	Dorset	Cappelle Desprez		3/55	
67/9	27/4/67	Devon	Champlein		60	
67/15	4/5/67	Dorset	Champlein		3/55	
67/16	11/5/67	Wye, Kent	Champlein		3/55	
67/17	11/5/67	Wye, Kent	Brittania		3/55+60	
67/18	11/5/67	Boston, Lincs.	Hybrid 46		3/55	
67/19	11/5/67	Boston, Lincs.	Brittania		3/55	
67/20	15/5/67	Terrington	Hybrid 46		3/55	
67/21	15/5/67	"	Viking		3/55	
67/22	15/5/67	"	Troll		3/55	
67/23	15/5/67	"	MGH. 6264		3/55	
67/26	17/5/67	Wiltshire	Rothwell Perdix		60	
67/27	19/5/67	Harper Adams	Elite Lepeuple		60	
67/28	19/5/67	Witham, Essex	Kloka		3/55	
67/29	19/5/67	Witham, Essex	Champlein		3/55	
67/30	19/5/67	Witham, Essex	Cappelle Desprez		3/55	
67/33	18/5/67	Shropshire	Cappelle Desprez		3/55	
67/35	19/5/67	King's Lynn	Cappelle Desprez		3/55	
67/36	22/5/67	Sparsholt	Viking		3/55	
67/37	22/5/67	Sparsholt	Rothwell Senator		60	
67/39	17/5/67	Kirton, Lincs.	Apex		3/55	
67/40	17/5/67	Kirton, Lincs.	Hybrid 46		3/55	
67/42	23/5/67	King's Lynn.	Hybrid 46		3/55	
67/43	22/5/67	Kelvedon, Essex	Trident		60	
67/44	24/5/67	Glamorgan	Hybrid 46		3/55	
67/47	23/5/67	Rosemaund	Hybrid 46		3/55	
67/48	23/5/67	Rosemaund	Cappelle Desprez		3/55	
67/50	25/5/67	Devon	Judy I		60	
67/53	1/6/67	Reading	Champlein		3/55	
67/55	1/6/67	Severn Stokes, Worcs.	Rothwell Senator		60	
67/56	6/6/67	Sparsholt	Kloka		3/55	
67/57	6/6/67	N.I.A.B. Trial Ground	Maris Ranger		3/55	
67/64	6/6/67	Wye	Ardent		-	
67/80	7/6/67	Brecon	Champlein		-	

Mixed reaction
Immune reaction

NIAB No.	Source of Isolates			Race	Comments
	Date	Place	Variety		
67/81	8/6/67	Welby, Lincs.	Kloka	3/55	Mixed reactions
67/82	8/6/67		Opal	3/55	
67/83	7/6/67	Holbeach, Lincs.	Cappelle Desprez	3/55	
67/84	9/6/67	Devizes, Wilts.	Cappelle Desprez	3/55	
67/88	9/6/67	Taunton, Somerset	Flamingo	3/55	
67/87	13/6/67	St. Ives, Cambs.	Apex	3/55	Mixed reactions
67/88	13/6/67	N.I.A.B. Trial Ground	Mildress	3/55+60?	
67/89	12/6/67	Bradfield St. George	Rothwell Senator	60	Not tested
67/90	11/6/67	Suffolk			
67/92	9/6/67	Shinfield, Reading	Aegilops 806	-	Immune reactions
67/93	12/6/67	Devon	Trident	60	
67/94	12/6/67	Hanbury	Cappelle Desprez	3/55	Mixed reactions
67/95	11/6/67	"	Cappelle Desprez	3/55	
67/96	11/6/67	Sparsholt	Kloka	-	Immune reactions
67/97	11/6/67	Sparsholt	Trident	60	
67/98	12/6/67	Kinver, Lincs.	Rothwell Sprite	60	Mixed reactions
67/99	12/6/67		FDA.15	-	
67/100	13/6/67	Monmouth	Kloka	60	Immune reactions
67/103	14/6/67	Lincoln	Apez	-	
67/104	14/6/67	Hampshire	Champlein	3/55	Mixed reactions
67/105	13/6/67	Norfolk	Kloka	60	
67/106	14/6/67	Bridgets, E.H.F., Hants	Cappelle Desprez	3/55	Mixed reactions
67/107	14/6/67	Hampshire	Cappelle Desprez	3/55	
67/109	14/6/67	Aberlady, E. Lothian	Rothwell Perdix	60	Mixed reactions
67/111	14/6/67	Plantwit Major (Glam.)	Tetrix	60	
67/113	14/6/67	"	Rothwell Senator	60	Mixed reactions
67/114	15/6/67	"	Cappelle Desprez	3/55	
67/115	14/6/67	Rothamsted	Champlein	3/55	Mixed reactions
67/116	19/6/67	Roundway Farm	Cappelle Desprez	3/55	
67/117	19/6/67	N.I.A.B. Trial Ground	Mildress	-	Mixed reactions
67/118	19/6/67	"	Joss Cambier	-	
67/121	15/6/67	Arthurstown, Co. Louth, (Ire)	Cama	3/55	variety identification may be wrong
67/122	15/6/67	Oxfordshire	Cappelle Desprez	60?	
67/123	15/6/67		Mildress	Race 60+?	Mixed reactions
67/124	15/6/67	"	Joss Cambier	60	
67/125	15/6/67	"	West Desprez	60	variety identification may be wrong
67/132	19/6/67	E. Yorkshire	Cappelle Desprez	2b	
67/133	20/6/67	Wye	Cappelle Desprez	60	Mixed reactions
67/134	20/6/67	"	Maris Ranger	3/55	
67/135	20/6/67	"	Cama	3/55	Mixed reactions
67/136	20/6/67	"	Janus	3/55+60?	
67/141	21/6/67	Buckland Dinham, Somerset	Kolibri	3/55+60?	Mixed reactions
67/142	21/6/67	"	Kloka	60	
67/144	12/6/67	"	Champlein	3/55	Mixed reactions
67/148	21/6/67	Thorney	Champlein	3/55	
67/149	20/6/67	Wisbech, Cambs.	Cappelle Desprez	3/55	Mixed reactions
67/152	23/6/67	Marlborough, Wilts	Cappelle Desprez	3/55	
67/153	22/6/67	Newport Pagnall, Bucks	Rothwell Senator	60	Mixed reactions
67/154	21/6/67	Worcestershire	Champlein	3/55	
67/156	22/6/67	Hereford	Cappelle Desprez	3/55	Mixed reactions
67/157	22/6/67	Roxton, Beds.	Champlein	3/55	
		"	Rothwell Senator	60	

WAB No.	Source of Isolate			Race	Comments
	Date	Place	Variety		
67/158	22/6/67	Roxton, Beds.	Tetrix	60	Variety identification may be wrong
67/159	23/6/67	Theale, Berks.	Champlein	3/55	
67/160	23/6/67	Theale, Berks.	Apex	3/55	
67/161	23/6/67	Sparsholt	Kloka	3/55	
67/162	23/6/67	Aston Tirröld, Oxon.	Cappelle Desprez	3/55	
67/163	23/6/67	Redbourne	Cappelle Desprez	3/55	Not tested
67/164	23/6/67	Penkridge, Staffs.	Rothwell Perdix	60	
67/165	23/6/67	Penkridge, Staffs	Cappelle Desprez	60	
67/166	23/6/67	Fife	Rothwell Perdix	60	
67/168	23/6/67	Scone, Perthshire	Rothwell Perdix	60	
67/171	26/6/67	E. Lothian	Manitoba Bearded wheat	-	Immune reactions
67/173	26/6/67	Thorney	Kloka	3/55	
67/174	26/6/67	Thorney	Cappelle Desprez	-	
67/175	26/6/67	Shrewsbury	Rothwell Senator	60	
67/176	26/6/67	Shrewsbury	Tetrix	60	
67/177	27/6/67	Stoneleigh, Warwick.	Rothwell Senator	60	Immune reactions
67/178	27/6/67	Cockle Park	Champlein	-	
67/179	27/6/67	"	FDA.15	3/55	
67/180	27/6/67	"	Maris Ranger	3/55	
67/181	27/6/67	"	Elite Lepeuple	60	
67/182	27/6/67	"	Cappelle Desprez	3/55	Mixed reactions
67/183	27/6/67	"	Hybrid 46	3/55	
67/184	27/6/67	Rosemaund	Opal	3/55	
67/185	27/6/67	"	Rothwell Sprite	60	
67/186	27/6/67	"	Svenno	3/55	
67/187	27/6/67	"	Jufy I	3/55	Mixed reactions
67/188	27/6/67	"	Kloka	3/55	
67/189	27/6/67	"	Kloka II	3/55	
67/190	26/6/67	Farndon, Nr. Chester	Joss Cambier	3/55+60?	
67/191	27/6/67	Edinburgh	Milfast	60	Mixed reactions
67/192	27/6/67	Edinburgh	Flamingo	60	
67/193	27/6/67	Wimmarleigh	Hybrid 46	3/55	
67/194	27/6/67	"	Cappelle Desprez	3/55+?	
67/195	27/6/67	"	Champlein	3/55	
67/196	27/6/67	"	Rothwell Senator	60	Mixed reactions
67/197	27/6/67	"	Elite Lepeuple	60	
67/198	27/6/67	"	Kolibri	60	
67/199	27/6/67	"	Kloka	3/55+60?	
67/200	27/6/67	"	Rothwell Sprite	60	
67/201	27/6/67	"	Ardent	60	Mixed reactions
67/203	27/6/67	"	Koga II	60	
67/204	27/6/67	Headley Hall	Troll	60	
67/205	27/6/67	"	Janus	3/55	
67/206	27/6/67	"	Ardent	60+3/55?	
67/207	27/6/67	"	Trident	60	Mixed reactions
67/208	27/6/67	"	Cappelle Desprez	3/55	
67/209	27/6/67	"	Margin	3/55	
67/211	27/6/67	"	Opal	3/55	
67/212	27/6/67	"	Sirius	60+3/55?	
67/213	27/6/67	"	Kloka	3/55	Mixed reactions
67/214	27/6/67	"	MGH.6264	3/55	
67/215	27/6/67	"	Kolibri	60	
67/216	27/6/67	"	Clarion	60	
67/217	27/6/67	"	W.9248	60	
67/218	27/6/67	"	Rothwell Sprite	60	Mixed reactions
67/219	27/6/67	"	Milfast	60	

Table 3 Continued

NIAB No.	Source of Isolates		Race	Comments
	Date	Variety		
67/220	27/6/67	Headley Hall	Heines VII	Mixed reactions
67/221	27/6/67	"	Viking	
67/222	27/6/67	"	Elite Lepeuple	Mixed reactions
67/224	29/6/67	Long Parish, Hants	Rothwell Perdix	
67/225	29/6/67	Long Parish, Hants	Rothwell Perdix	
67/226	29/6/67	Long Parish, Hants	Rothwell Perdix	
67/229	30/6/67	N.Berwick, E.Lothian	Rothwell Perdix	
67/230	30/6/67	N.Berwick, E.Lothian	Rothwell Senator	
67/231	4/7/67	Sparsholt	Cappelle Desprez	
67/232	4/7/67	"	Janus	
67/233	4/7/67	"	Kolibri	
67/234	4/7/67	"	Kloka	
67/235	4/7/67	"	Opal	Mixed reactions
			Sirius	
67/236	4/7/67	Bradfield St. George, Suffolk.	Cappelle Desprez	Immune reactions
67/237	4/7/67	Spowston	Cappelle Desprez	
67/239	4/7/67	"	Rothwell Perdix	
67/240	4/7/67	"	Rothwell Senator	
67/244	4/7/67	"	Viking	
67/242	4/7/67	"	Joss Cambier	
67/243	6/7/67	Rosemaund	Kolibri	
67/244	6/7/67	Rosemaund	Trident	
67/245	6/7/67	Rosemaund	Janus	
67/246	6/7/67	Rosemaund	Maris Ensign	
67/248	7/7/67	Harper Adams	Clarion	Mixed reactions
67/249	7/7/67	Chester	Mildress	
67/250	7/7/67	"	Troll	Mixed reactions
			3/55+60?	
67/251	7/7/67	"	Kolibri	Mixed reactions
67/252	6/7/67	Abergavenny	Mildress	
67/253	6/7/67	Aberystwyth	Rothwell Sprite	Mixed reactions
67/254	10/7/67	Whittlesey	Maris Ranger	
67/255	7/7/67	Brandon, Norfolk.	Rothwell Sprite	
67/256	7/7/67	Efford, Lymington, Hants.	Rothwell Perdix	
67/259	7/7/67	Coldstream, Berwick-shire	Cappelle Desprez	Mixed reactions
			-	
67/262	11/7/67	Marholme	Koga II	Mixed reactions
67/263	11/7/67	Barton in Needwood, Staffs.	Cappelle Desprez	
67/264	11/7/67	Sparsholt	Maris Beacon	Mixed reactions
67/265	10/7/67	Aberystwyth	Rothwell Perdix	
67/266	10/7/67	"	Svenno	
67/267	10/7/67	"	Koga II	
67/268	10/7/67	"	Kloka	
67/269	10/7/67	"	Rothwell Sprite	
			60+3/55?	
67/270	10/7/67	"	Clarion	
67/271	10/7/67	"	Cpal	
67/276	12/7/67	East Mornmouth	Cappelle Desprez	
67/277	12/7/67	Hereford	Cappelle Desprez	Mixed reactions
67/278	12/7/67	Hereford	Champlein	
67/279	12/7/67	Hereford	Rothwell Senator	Mixed reactions
67/280	18/7/67	East Craigs, Edinburgh	Mildress	
			60+?	Mixed reactions
67/281	18/7/67	"	Kolibri	
67/282	18/7/67	"	Caesar	Mixed reactions
			-	
67/283	18/7/67	"	Rothwell Sprite	Mixed reactions
67/284	18/7/67	"	Koga II	
67/285	18/7/67	"	Trident	Mixed reactions
67/286	18/7/67	"	Svenno	
67/288	18/7/67	"	Maris Teal	Mixed reactions
			3/55	

NIAB No.	Source of Isolate			Race	Comments
	Date	Place	Variety		
67/289	18/7/67	Cockle Park	Rothwell Sprite	60	
67/290	18/7/67	"	Ardent	60	
67/291	18/7/67	"	Joss Cambier	60	
67/292	18/7/67	"	Kolibri	60	
67/293	18/7/67	"	Sirius	3/55	Mixed reactions
67/294	18/7/67	"	Caesar	60+?	Mixed reactions
67/295	18/7/67	"	Janus	60+?	Mixed reactions
67/296	18/7/67	"	Kloka	-	
67/297	18/7/67	"	Koga II	60	
67/298	18/7/67	"	Opal	3/55	
67/299	18/7/67	"	Clarion	3/55	
67/300	24/7/67	Sparsholt	Joss Cambier	60	
67/301	24/7/67	"	TB. 396/37	2b or 3/55	
67/302	27/7/67	Cockle Park	Cleo	60	
67/303	26/7/67	Kincardineshire	Rothwell Perdix	60	
67/304	27/7/67	Cockle Park	Elite Lepeuple	60	
67/305	28/7/67	Boghall, Edinburgh	Kolibri	60	
67/306	28/7/67	Boghall, Edinburgh	Maris Totem	-	Mixed reactions
67/307	28/7/67	Sparsholt	Petkus 7L/64	3/55	
67/308	28/7/67	Midlothian	Mildress	60	
67/309	28/7/67	"	Joss Cambier	-	Mixed reactions
67/310	28/7/67	"	Cappelle Desprez	-	Mixed reactions
67/312	28/7/67	"	Flamingo	60	
67/313	28/7/67	"	Rothwell Senator	60	
67/314	4/8/67	Backweston, Co. Kildare	Quern	60	
67/315	4/8/67	"	Prident	60	
67/317	4/8/67	Llanarth, Monmouthshire	Prident	60	
67/318	4/8/67	Edinburgh	Maris Totem	-	Mixed reactions
67/319	7/8/67	Sutton Bonington	Kolibri	60	
67/320	7/8/67	"	Kloka	3/55	
67/321	7/8/67	"	Rothwell Sprite	60	
67/322	7/8/67	"	Koga II	60	
67/323	7/8/67	"	Ardent	-	Mixed reactions
67/324	7/8/67	"	Sirius	-	Mixed reactions
67/325	7/8/67	"	Svenno	60	
67/326	4/8/67	Forfar, Angus	Rothwell Senator	60	
67/327	4/8/67	"	Cappelle Desprez	-	Immune reactions
67/328	4/8/67	"	Mildress	Mixed reactions	
67/331	4/8/67	Scone, Perthshire	Joss Cambier	60	
67/332	4/8/67	"	Cappelle Desprez	-	Mixed reactions
67/333	4/8/67	"	Rothwell Senator	60	
67/334	2/8/67	Haddington, E. Lothian	Cappelle Desprez	3/55	Mixed reactions
67/335	2/8/67	"	Mildress	3/55+60?	Mixed reactions
67/336	2/8/67	"	Joss Cambier	-	Mixed reactions
67/337	3/8/67	Ratho, Midlothian	Joss Cambier	60+?	Mixed reactions
67/338	3/8/67	"	Mildress	-	Mixed reactions
67/339	3/8/67	"	Capitole	60	
67/340	3/8/67	"	Rothwell Senator	60	
67/341	3/8/67	"	Cappelle Desprez	60+3/55?	Mixed reactions
67/342	17/8/67	East Weneys, Fife	Cappelle Desprez	-	Mixed reactions
67/343	17/8/67	Fife	Rothwell Senator	60	
67/344	13/8/67	Fife	Capitole	60	

5. Summary

Identification of wheat yellow rust races in 1967 is summarised in Table 6.

Table 1.

Race	No. of samples
3/55	99
60	100
2b	3
3/55+60? Mixed	39
Immune	7
TOTAL	248

Races 3/55 and 60 were the most common races in 1967. Race 3/55 was identified in general from more winter wheat samples and race 60 in general from more spring wheat samples. This is probably a reflection of the resistance of wheat varieties to yellow rust. Winter wheat varieties on the Recommended List are susceptible, to varying degrees, to race 3/55, with the exception of Joss Cambier and Elite Lepeuple. Three varieties of winter wheat susceptible to race 3/55, i.e. Cappellet Desprez, Hybrid 46 and Champplain are varieties grown on a large scale in this country. More spring wheat varieties are in general susceptible, to varying degrees, to race 60.

Race 2b, a race previously common in Britain, was identified from three samples only and race 8b, which was also common, was not identified during 1967. Within the limits of the race survey, it is apparent that race 2b and 8b have been superceded by other virulent races of the pathogen.

Four isolates, when tested on differential varieties gave reactions different from any known race pattern. Further tests are still in progress. Also a number of isolates gave mixed reactions on the differential varieties. It has been shown that some of these isolates were a mixture of race 3/55 and race 60.

B.

Yellow rust - barley. Plant Breeding Institute, Cambridge.

R. Johnson.

1. A total of 48 samples of barley yellow rust was received by the P.B.I. during 1967. However, due to unavoidable circumstances, poor growth conditions impeded establishment of isolates with the result that the isolates were lost and not identified.

The results of a race survey of barley yellow rust conducted in 1966 showed that race 23 and race 24 were the races occurring frequently in Britain. Race 23 was generally more common during the early part of the season, whereas race 24 predominated during the latter part of the season. This is shown in Table 7.

Table 7

Date	Race 23 No. of Isolates	Race 24 No. of Isolates
June 1-15	3	0
June 16-30	7	0
July 1-15	5	4
July 16-31	1	9

Tests of variety susceptibility using these two races indicated that some spring barley varieties are resistant to race 23 and that all spring barleys are susceptible to race 24. These tests were conducted on barley varieties on the N.I.A.B. Recommended List and the results are shown in Table 8.

Table 8

Reaction of barley varieties to race 23 of barley yellow rust	
Resistant varieties	Susceptible varieties
Zephyr	Sultan
Julia	Impala
Deba Abed	Inis
Cambrinus	Maris Concord
Mosane	Maris Badger
Europa	Proctor

6.

Crown rust - oats. Welsh Plant Breeding Station, Aberystwyth

B. Clifford

1. A total of 17 samples of oat crown rust was received during 1967 by the W.P.B.S.
2. Varieties from which samples were collected Winter and spring oat varieties are shown in Table 9

Table 9

Variety	No. of samples
Maris Quest	3
Peniarth	3
Padarn	2
Pendrwm	1
Mostyn	1
Manod	1
Condor	1
Nina	1
S.172	1
587 (n3/7/31)	1
Volunteer Oat	1
Seedlings	1
Yorkshire Fog (Holcus lanatus)	1
TOTAL	17

3. Localities from which the oat crown rust samples were collected

Samples were collected from 8 localities in the British Isles. The locality from which each was collected and the variety from which it was collected is shown in Table 10.

Table 10

Location	Source Variety	No. of samples
Cwmystynant (Cards)	Manod	1
Dorset	Peniarth	1
Glamorgan	Peniarth, Padarn, Maris Quest, S.172, 5687 (n3/7/31)	5
Headley Hall (Yorks)	Yorkshire Fog (Holcus lanatus)	1
Newcastle	Nina	1
Sprowston (Hants)	Maris Quest	1
Trawscoed (Cards)	Condor, Mostyn	2
Tynpynfarach (Cards)	Volunteer oat seedlings	1
Wye (Kent)	Maris Quest, Pendrwm, Peniarth, Padarn	4
	TOTAL	17

4. Race identification

Only seven of the isolates were identified the remainder failing to produce spores. Three races were identified and the results are shown in Table 11.

Table 3.

Race	No. of Isolates	Variety and Place
229	3	Maris Quest (Sprowston), Peniarth, Padarn (Wye)
234	2	Peniarth (Dorset), Nina (Newcastle)
272	2	Maris Quest (Sprowston) Condor (Trawscoed)

5.

Summary

The limited number of isolates received and subsequently tested make it difficult to come to any firm conclusions. The results indicate that the race spectrum of crown rust had remained relatively stable.

D.

Mildew - Wheat Plant Breeding Institute Cambridge, L. S. Wolfe

1. A total of 122 samples of mildew was received by the P.B.I. in 1937.
2. Varieties from which samples were collected

Winter wheat varieties are shown in Table 12, spring wheat varieties are shown in Table 13.

Table 12

Winter wheat	No. of samples
Cappelle Desprez	15
Rothwell Senator	11
Maris Ranger	9
Hybrid 46	7
Mildress	6
Joss Cambier	5
Elite Lepeuple	3
Champlein	1
Maris Widgeon	1
West Desprez	1
TOTAL	59

Table 13

Spring wheat	No. of samples
Kloka	8
Rothwell Sprite	8
Sirius	6
Svenno	4
Koga II	3
Janus	2
Opal	2
Maris Ensign	2
Rothwell Trident	2
Troll	2
Atle	1
Kolibri	1
TOTAL	41

3. A further 22 samples were collected from other varieties.
 - Localities from which the wheat mildew samples were collected.
- Samples of mildew were collected from 27 localities in the British Isles. The locality from which each isolate was collected and the variety from which it was collected is shown in Table 14.

Table 74

Location	Source Variety	No. of samples
Aberystwyth (Cards)	Mildress, Svenno, Kogall	4
Backweston (Co.Kildare)	Rothwell Sprite	
Bristol	Atle	1
Cambridge	Kloka	1
	Cappelle Desprez, Rothwell Perdix,	
	Rothwell Sprite, Opal plus nine	
	other varieties	13
Cambridgeshire	Sirius, Rothwell Sprite,	5
	Troll, Kloka, Maris Ensign	1
Chester	Cappelle Desprez	
Docking (Norfolk)	Cappelle-Desprez, Rothwell	
	Senator, Joss Cambier, Hybrid 46	4
Durrow (Essex)	Rothwell Senator, H.77C	2
Edinburgh	Kloka, Svenno	2
East of Scotland	Cappelle Desprez (4), Maris	
	Ranger (4), Rothwell Senator(3),	
	Joss Cambier (2), Mildress,	
	Capitole	15
East Yorkshire	Mildress, Joss Cambier, Apex	3
Harper Adams	Cappelle Desprez, Rothwell	
(Newport, Salop)	Senator, Hybrid 46	
Hereford	Rothwell Senator	3
Kinver (Worcs.)	Cappelle Desprez, Mildress,	1
	Champlein, Joss Cambier, Elite	
	Lepeuple, Rothwell Senator,	
	Sirius, Hybrid 46, West Desprez,	
	WDA.15, Kloka, Koga II, Janus,	
	Rothwell Sprite, Svenno,	
	Mildress, Apex	15
Leeds		2
Newcastle	Cappelle Desprez, Mildress,	
	Maris Ranger, Hybrid 46	4
N. Berwickshire	Cappelle Desprez	1
Reading (Berks)	Meteor	1
Rosemaund (Hereford)	Cappelle Desprez, Maris Ranger,	
	Rothwell Senator, Elite Lepeuple	
	Hybrid 46	5
Silloth (Cu.b.)	Maris Ranger, Hybrid 46	2
Sparsholt (Hants)	Cappelle Desprez, Rothwell	
	Senator, Maris Ranger, Elite	
	Lepeuple, Hybrid 46, Rothwell	
	Sprite, Kloka, Rothwell Trident,	
	Janus, Maris Ensign	10
Sutton Bonington	Kloka, Rothwell Sprite, Koga II,	
(Notts)	Sirius, Caesar, Ardent (LAE 2/6)	6
Wimmarleigh	Cappelle Desprez, Maris Ranger,	
(Preston, Lancs)	Elite Lepeuple, Hybrid 46, Sirius	5
Winscombe (Somerset)	Troll, Sirius, Opal, Rothwell	
	Sprite, Kloka, Rothwell Trident,	
	Kolibri	7
Witham (Essex)	Wheat?	2
Wolverhampton (Staffs)	Cappelle Desprez, Rothwell	
	Senator, Maris Widgeon, Kloka	4
Wye (Kent)	Sirius, Svenno, Rothwell Sprite	3
	TOTAL	122

4. Race Identification

21 isolates of wheat mildew were tested in 1967. Identification of races is shown in Table 15.

Table 15

Race	No. of Isolates	Variety and Place
0	4	Cappelle Desprez (Cambridge) Maris Ranger (Cockle Park), Sirius (Winmarleigh), Joss Cambier (Forfar)
3	2	Elite Lepeuple, Rothwell Senator (Kinver)
13	7	Hybrid 46, Kloka (Sparsholt), Opal Redcoat (Cambridge), Rothwell Senator (Cockle Park), Maris Ranger (Winmarleigh), Kloka (Sutton Bonington)
14	3	Cappelle Desprez (Docking), Rothwell Perdix (Cambridge), Maris Ranger (Fife)
16	4	Hybrid 46, Cappelle Desprez (Kinver), Rothwell Senator (Sparsholt, Hereford)
19	1 21	Rothwell Senator (Scone, Perth) TOTAL

5. Summary

6 different races were identified from the wheat mildew samples.
A summary of the races identified from samples of mildew collected is shown in Table 16.

Table 16

Variety	Races
Cappelle Desprez	0, 14, 16
Rothwell Senator	3, 13, 16, 19
Joss Cambier	0
Maris Ranger	0, 13, 14
Hybrid 46	13, 16
Kloka	13 (2)
Sirius	0
Elite Lepeuple	13
Rothwell Perdix	14

E.

Mildew - Barley. Plant Breeding Institute, Cambridge.

M.S. Wolfe

1. A total of 173 samples of mildew were received by the P.B.I. during 1967.
 2. Varieties from which samples were collected.
- Winter barley varieties are shown in Table 17 and spring barley varieties in Table 18.

Table 17

Winter barley	No. of samples
Pioneer	8
Dea	4
Maris Otter	3
Leon	2
Pella	2
Malta	1
TOTAL	20

Table 18

Spring barley	No. of samples
Impala	25
Proctor	19
Zephyr	17
Deba Abed	14
Maris Druid	9
Inis	9
Sultan	8
Julia	7
Maris Badger	4
Vada	4
Maris Concord	3
Ruby	3
Tern	2
Emir	1
Europa	1
HB 380/22	1
Miln's Golden Promise	1
Total	128

A further 25 samples were received from other varieties of barley.

3. Localities from which the barley mildew samples were collected
- The locality and variety from which each sample was collected is shown in Table 19.

Table 42

Location	Source Variety	No. of Samples
Aberystwyth(Cards)	Dea, Maris Otter, Proctor, Impala, Deba Abed, Zephyr	6
Backweston(Co.Kildare)	Banba	1
Beverley(E.Yorks)	Deba Abed, Julia	1
Bridport(Dorset)	Proctor, Impala, Zephyr, Deba Abed, Inis, Maris Druid	6
Bristol	Impala(2), Zephyr(2), Proctor, Maris Druid, Maris Badger	7
Cardiff	Proctor, Zephyr, Maris Druid, Deba Abed, Tern, Inis	6
Chester	Vada	1
Cambridge	Impala(2), Proctor, Sultan Vada, Maris Concord, plus 19 other varieties	25
Cambridgeshire	Sultan, Deba Abed, Inis, Tern	4
Cornwall	Ruby(2), Impala(2), Sultan (2), Europa, Inis, Maris Concord, Maris Badger, Emir, Maris Druid, Proctor, Fong Tien, Algerian.	15
Devon	Proctor(2), Impala(3), Deba Abed, Zephyr, Sultan, Maris Druid, HB 390/22	10
Dunmow(Essex)	Impala	1
Edinburgh	Impala, Pella, Dea, Leon(2) Pioneer, Zephyr, Proctor	8
Isle of Wight	Impala, Zephyr, Proctor Deba Abed, Maris Druid, Julia, Inis	7
Kinver(Worcs)	Pella, Dura, Sola, Maris Druid, Zephyr, Julia, Sultan, Inis, Impala, Pioneer, Proctor, Dea, Maris Otter	13
Leeds	Julia, Deba Abed	2
Newcastle	Julia, Pioneer	2
N. Yorkshire	Impala, Zephyr, Inis Deba Abed	4
Norwich(Norfolk)	Maris Badger, Maris Concord	2
Reading(Berks)	Proctor, Inis, Julia	3
Rosemaund(Hereford)	Dea, Malta, Maris Otter, Pioneer, Proctor	5
Rothamsted(Herts)	Pioneer	1
Rothwell(Lincs)	Impala	1
Trawscoed (Aberystwyth,Cards)	Impala(2) Zephyr	3
Warminster(Wilts)	Impala, Zephyr, Proctor, Ruby, Deba Abed, Miln's Golden Promise	6

Table 19 (Continued)

Location	Source Variety	No. of Samples
Wiltshire Winmarleigh (Preston, Lancs)	Impala, Proctor	2
	Impala, Zephyr, Proctor Pioneer, Deba Abed, Maris Druid	6
Winscombe (Somerset) Witham (Essex)	Impala, Zephyr	2
	Impala, Zephyr, Proctor, Deba Abed, Pioneer(2)	6
Wolverhampton (Staffs)	Impala, Zephyr, Deba Abed(2), Sultan(2), Inis, Proctor, Julia, Maris Druid, Vada(2)	12
	Zephyr, Proctor, Maris Badger, Julia	4
Wye (Kent)	TOTAL	173

4. Race identification

Isolates were obtained from many of the samples and of these 64 were tested and the race identified. The results are shown in Table 20.

Table 20

Race	No. of Isolates	Variety and Place.
A0	1	Leon (Edinburgh)
A7	3	Dea (Kinver) Ab 2231 (P.B.I.) Proctor (Wye)
A21	1	Proctor (P.B.I.)
'A857' (4)	2 (7)	Pioneer (Kelvedon), Pioneer (Norpeth)
D1	3	Dea (Kinver), HB380/22 (Seale- Hayne), Proctor (Warminster)
D5	1	Sultan (Seale-Hayne)
D8 (3)	1 (5)	Proctor (Reading)
C4	16	Impala (Kelvedon, Kinver, Isle of Wight), Zephyr (Warminster, Yeovil), Proctor (Kinver, Sparsholt), Deba Abed (Sparsholt, Wimbourne), Pioneer, Inis, Sola (Kinver), Maris Badger (Sparsholt) Maris Druid, HB380/22 (Seale- Hayne), Lyclallpur (P.B.I.)
C5	17	Impala (Isle of Wight, P.B.I. Seale-Hayne, St. Columba), Zephyr (Kinver, Warminster), Maris Concord (P.B.I. Sprowston), Maris Druid (Seale-Hayne, Sparsholt), Dea (Bristol), Proctor (P.B.I.), Maris Badger (Sprowston), Inis (Isle of Wight), Sola (Kinver), Vada (P.B.I.), Fong Tien (St. Columba)
C6	1	Julia (Kinver)
C9	1	Deba Abed (Kelvedon)

Table 20 (Continued)

Race	No. of Isolates	Variety and Place
C10	4	Deba Abed (Bristol), Ruby (Warminster), Inis (Isle of Wight), Miln's Golden Promise (Wimbourne)
C26(6)	10(49)	Impala (Dorset, Seale-Hayne), Pioneer (Rosemaund), Deba Abed (Spasholt), Zephyr (Alveston), Proctor (Kelvedon), Inis, Maris Druid (Kinver), Julia (Kinver, Reading)
	61	TOTAL

5. Summary

Four of the races were capable of attacking Impala. The frequency of these races was 77% of the isolates analysed and many samples from varieties other than Impala were identified as "Impala - virulent races". Table 21 indicates the number of isolates collected from varieties with a specific type of major gene resistance to mildew which were identified as "Impala virulent races".

Table 21

Genes for resistance	No. of isolates
Neither Mlg nor Mla6	13
Mlg	15
Mla6	8
Mlg + Mla6	10
TOTAL	47

The races obtained from particular varieties with specific genetic resistance to mildew are shown in Table 22.

Table 22

Gene	Variety	Races
-	Proctor Dea Pioneer	A7, A21, D1, D8, C4(2), C5, C26 A7, D1 'A857'(2), C4, C26
Mlg	Deba Abed Inis Julia Zephyr	C4(2), C5, C9, C10, C26 C4, C5, C10, C26 C6, C26 C4(2), C5(2), C26
Mla6	Maris Badger Maris Concord Maris Druid	C4, C5 C5 C4, C5, C26
Mlg + Mla6	HB.380/22 Impala	D1, C4 C4(3), C5(4), C26(2)
'Mle' (Arabische)	Sultan	D5
derived from Hordeum laevigatum	Vada	C5

Note:- Inis has now been shown to possess the same genes for resistance as Impala, i.e., Mlg + Mla6.

P.

Mildew - oats. Welsh Plant Breeding Station, Aberystwyth

I. T. Jones

1. A total of 42 samples of oat mildew was received by the W.P.B.S. in 1967.

2. Varieties from which samples were collected.
Table 23 shows only varieties from which isolates were successfully identified and does not include a further 20 varieties from which samples failed to grow. Winter and spring oat varieties are included together in the table.

Table 23

Variety	No. of samples
Condor	4
Manod	4
Mostyn	3
Padarn	2
Peniarth	2
Maris Quest	1
Pennant	1
Titus	1
W 16412	1
MGH 6374	1
Nina	1
Bento	1
TOTAL	22

3. Localities from which oat mildew samples were collected.
Only varieties from which samples were identified are shown in Table 24.

Table 24

Location	Source Variety	No. of samples
Bankfoot (Perth)	Titus, W16412, MGH6374, Nina, Bento	5
Edinburgh	Manod	1
Guernsey	Condor	1
Hereford	Peniarth	1
Kinver (Worcs)	Manod, Mostyn, Condor, Maris Quest, Padarn	5
Reading	Pennant	1
Rosemaund (Hereford)	Condor, Manod, Padarn, Peniarth	4
Sutton Bonington (Notts.)	Manod, Mostyn, Condor	3
W.P.B.S.	Mostyn	1
	TOTAL	22

4. Race identification

The 22 isolates indicated previously have all been identified; the remaining 20 failed to produce spores. Race 2 was identified from 21 samples, the remaining sample, collected from Mostyn at the W.P.B.S. was identified as race 4.

5. Summary

Race 2 was the most frequent race identified during the 1967 survey; the race spectrum has remained stable.

3.

Rhynchosporium - barley. The University of Reading

H. Owen.

1. A total of 227 samples of Rhynchosporium was received at the University of Reading during 1967.

2. Varieties from which the samples were collected.

Winter barley varieties are shown in Table 25, spring barleys in Table 26.

Table 25

Winter barley	No. of samples
Maris Otter	20
Pioneer	11
Maris Puma	3
Dea	3
Malta	3
Vulcan	2
Pella	2
Leon	2
Senta	1
American Hybrid	1
Eckendorf 5844	1
TOTAL	49

Table 26

Spring barley	No. of samples
Deba Abed	29
Impala	18
Proctor	15
Zephyr	15
Sultan	12
Julia	9
Maris Druid	8
Vada	6
Mosane	5
CIV 293/4	4
Delisa	3
Maris Badger	3
Tern	3
Ymer	3
Milns Golden Promise	2
Pallas	2
Probstdorfa Sola	2
Riba	2
Arla, Dina, Inis,	
Heines Peragis, Kuby,	
MGH 59175, Maris Concord	
SV 61718, Swallow	
1 each	9
Unknown varieties	28
TOTAL	180

3. Locations from which samples were collected.

Samples were collected from 61 localities in the British Isles and the locations from which samples were collected, and the varieties from which samples were collected, are shown in Table 27.

Table 27

<u>Location</u>	<u>Source variety</u>	<u>No. of samples</u>
Aberdeen	Arla, Deba Abed (2), Delisa, Miln's Golden Promise, Maris Otter, SV 61718, Zephyr	8
Aberystwyth	American hybrid, Maris Otter, Rika	3
Abingdon (Berks.)	Zephyr	1
Anglesey	Heines Peragis, Impala, Maris Concord	3
Anmer (Norfolk)	Julia, Deba Abed, Delisa, Impala, Inis, Mosane, Pella, Proctor, Sultan, Tern, Zephyr, Maris Druid	12
Auchincruive (Ayr.)	Dea, Maris Otter, Maris Puma, Pioneer	4
Aston Tirrold (Berks.)	Julia, Proctor, Sultan, Zephyr	4
Basingstoke (Hants.)	Maris Otter	1
Beverley (Yorks.)	Julia, Deba Abed, Impala, Mosane, Sultan, Zephyr	6
Biggleswade (Beds.)	Unknown	1
Burton (Ches.)	Vada	1
Cirencester (Gloucs.)	Deba Abed	1
Cockle Park (Northumb.)	Maris Otter, Pioneer, Vulcan	3
Cornwall	Maris Badger, Unknown (4)	5
Cranborne (Dorset)	Maris Otter	1
Cullompton (Devon)	Deba Abed, Impala	2
Cumberland	Deba Abed, Impala, Sultan	3
Devizes (Wilts.)	Proctor	1
Docking (Norfolk)	Julia, Deba Abed, Dina, Maris Druid, Impala, Malta, Maris Otter, Maris Puma, Sultan	9
Dorchester (Dorset)	Maris Otter, Pioneer	2
Dunbar (E.Loathian)	Julia, CIV 293/4, Deba Abed, Sultan	4
Dunmow (Essex)	Impala	1
Edinburgh	Dea, Leon, Maris Otter (2), Pioneer, Proctor (2), Sultan	8
Gadshill (I.O.Wight)	Deba Abed, Maris Druid, Mosane, Tern	4
Garstang (Lancs.)	Maris Otter	1

Table 17 contd.

Location	Source variety	No. of samples
Glamorgan	Deba Abed, Proctor, Sultan, Tern, Maris Druid	5
Harper Adams (Salop)	Maris Otter, Pioneer	2
Headley Hall (Yorks.)	Deba Abed, Maris Otter, MGH 59175	3
Hereford	Unknown	1
Holsworthy (Devon)	Unknown	1
Kelvedon (Essex)	Impala, Maris Otter, Pioneer, Proctor	4
Kincardineshire	Deba Abed	1
Kinver (Worcs.)	Maris Otter	1
Leicestershire	Unknown	3
Mapledurham (Oxon.)	Unknown	1
Marlow (Bucks.)	Unknown	1
Milford Haven (Pembs.)	Impala	1
Montgomery	Deba Abed	1
Newburgh (Aberdeens.)	Mosare, Ymer (2)	3
Newcastle	Julia, CIV 293/4, Probstdorfa-Sola	3
Newton Abbot (Devon)	Unknown	1
Northants	Unknown	2
Oxford	Impala	1
Rosemaund (Herefs.)	Malta, Maris Otter, Pioneer	3
Ross-shire	Zephyr	1
Rothamsted (Herts.)	Pioneer	2
Shinfield (Berks.)	Unknown	1
Somerset	Unknown	3
Sonning (Berks.)	Unknown	1
Sprowston (Norfolk)	Julia, CIV 293/4, Eckendorf 5844, Impala, Sultan, Vulcan, Maris Druid	7
Stamford (Lincs.)	Unknown	1
Stetchworth (Cams.)	Unknown	1
Sussex	Unknown	5
Tiverton (Devon)	Vada	1
Tring (Herts.)	Maris Otter	1
Upcott Barton (Devon)	Deba Abed, Impala, Proctor, Sultan, Maris Druid	5
Warminster (Wilts)	Julia, Delisa, Miln's Golden Promise, Impala, Maris Badger, Proctor, Sultan, Vada, Zephyr, Maris Druid	10
Winchester (Hants.)	Leon, Malta, Maris Otter, Maris Puma, Pella, Pioneer, Senta	7
Wokingham (Berks.)	Unknown	1
Wye (Kent)	Julia, CIV 293/4, Dea, Deba Abed, Impala, Maris Otter, Pioneer, Probstdorfer Sola, Proctor, Sultan, Maris Druid	11

Table 27 cont.

Location	Source variety	No. of samples
Various (Plant Path. Lab. Barley Disease Survey)	Deba Abed (13), Impala (4) Maris Badger, Maris Otter, Mosane, Pallas (2), Proctor (5), Rika, Ruby, Swallow, Vada (3), Ymer, Zephyr (8)	42
	TOTAL	227

4. Race identification

179 isolates of Rhynchosporium were obtained from the samples and of these 123 have been tested. 26 of the isolates were identified as race A. This race attacks all barley varieties grown commercially in Britain but La Mesita, Osiris and Trebi are resistant to race A. Race B was identified from 97 isolates and this race attacks all spring varieties and a number of two-rowed winter barley varieties. Generally, the six-rowed barley varieties are resistant to race B, as are La Mesita, Osiris and Trebi.

The remaining 56 isolates were not tested because they were from varieties not exhibiting any specific genetic resistance.

5. Summary

Two races of Rhynchosporium, race A and race B, were identified in this survey. Between them, these races are capable of attacking all barley varieties currently grown in commerce in Britain, although the six-row winter barley varieties still exhibit good field resistance.

H.

Leaf spot (Drechslera avenae) - oats. East Craigs, Edinburgh.

M. Noble

1. A total of 62 samples was received at East Craigs during 1967.
2. The names of varieties from which the samples were collected are not known.
3. Samples of diseased leaf tissue and oat seed samples were sent to East Craigs and the source of the material is shown in Table 28.

Table 28

Source of Material	No. of samples
Scottish oat certification scheme. Samples with GC or FA certificates submitted for SS. from all parts of Scotland except the N. West (Seed)	45
North of Scotland College of Agriculture (Leaf material)	8
East of Scotland College of Agriculture (Seed)	8
N.A.A.S. Shardlow (Derby) (Seed)	1
TOTAL	62

4. Identification of isolates
Mercury tolerant isolates of Drechslera avenae were obtained from all samples tested at East Craigs. The levels of infection by mercury tolerant isolates ranged from 2% to 80%.
5. Summary
The results of the survey indicate that strains of Drechslera avenae, tolerant to mercury, are widespread.

Final Summary of 1967 Physiologic Race Survey

1. A total of 1034 samples of diseased material was collected and sent to five centres for identification of physiologic races.
2. Identification of wheat yellow rust samples indicated that race 3/55 and race 60 were the most frequently occurring races. Race 2b and 8b previously common races in Britain were identified from three and no samples respectively. A number of isolates gave interesting reactions on the differential varieties.
3. Race 13 and 16 were the most frequent races of wheat mildew identified.
4. The incidence of races of barley mildew capable of overcoming the Mlg and Mla6 genes for resistance level increased, many being identified in samples of mildew from varieties other than Impala and HB 380/22.
5. The most frequent oat mildew race identified was race 2.
6. Two race groupings of Rhynchosporium were identified and between them are capable of attacking the majority of barley varieties. Six-row winter barley varieties exhibit good field resistance.
7. Strains of Drechslera avenae, tolerant to levels of mercury used in seed dressings are widespread.

I would like to thank all participants who contributed information contained in this report.

N. H. Chamberlain,
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Physiologic Race Survey Committee,
National Institute of Agricultural
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Cambridge.

22. 11. 68.

F. B. C. MILDEW NURSERY

During 1968, a number of members of the European Barley Committee agreed to assist in a project to grow a small nursery of barley varieties with known mildew resistance. The object was to determine the usefulness of the resistance genes in the different countries. The varieties chosen were as follows:-

<u>Variety</u>	<u>Resistance gene</u>	<u>Note</u>
Kenia	-	Susceptible control
Akka	ML _m ⁺ ?	Derived from Monte Cristo
Impala	MLg + ML _a ⁶	
Maris Concord	ML _a ⁶	Similar to Maris Badger, Maris Druid
Rothwell Tern	ML _a ⁷	Derived from a Lyallpur selection
Sultan	'ML _e '	Similar to Emir; both derived from Arabische
Vada	?	Derived from <u>Hordeum laevigatum</u>
Zephyr	MLg	Resistance from Pflug's Intensiv as with many other European varieties.

Seed of these varieties was sent to sixteen centres across western Europe. Unfortunately, at two of the centres, in Portugal and Spain, the seed was received too late for the sowing season. Results received from the other fourteen centres are summarised in Table 1. Various scoring systems were used: they have been converted to a 0-4 scale (4 = fully susceptible) for convenience and comparison. The final date of scoring has been taken in each case.

Table 1

Centre	Variety							Mean
	Kenta	Akka	Tern	Sultan	Vada	Zephyr	Concord Impala	
England	4	0	0	0	1	3-4	3	1.8
Cambridge N.I.A.B.	4	0	0	t	1	3	4	2.0
" P.B.I.							3-4	

Table 1 (cont.)

Centre	Variety								Mean
	Kenia	Akka	Tern	Sultan	Vada	Zephyr	Concord	Impala	
<u>Ireland</u>									
Backweston	2	t	0	0	t	0	1	1	0.6
Ballinacurra	0	0	0	0	0	t	t	0	0.1
Clonakilty	0	0	0	0	0	0	0	0	0.0
<u>Scandinavia</u>									
Nordgaardein (Den.)	4	0	0	0	t	4	4	4	2.1
Helsingin Pit (Fin.)	t	0	0	0	0	0	0	0	0.1
Svalbv (Swe.)	3	0	0	0	t	1-2	1	1	0.9
<u>Netherlands</u>									
Bruinuisse	3	0	0	0	t	3	3-4	2-3	1.6
<u>Belgium</u>									
Gembloux	3-4	0	0	0	2-3	3	3	1	1.6
<u>France</u>									
Maule	4	0	0	0	0	2	1	1	1.0
<u>Switzerland</u>									
Zürich	4	0	t	t	1	4	1	1	1.5
<u>Germany</u>									
Freising Weihestephan	3	0	0	0	t	3	1	0-1	1.0
<u>Austria</u>									
Vienna	0	0	0	0	0	0	0	0	0.0
Mean	2.5	0	0	0	0.5	2.0	1.6	1.3	

TABLE I. Mildew scores on a 0-4 scale (0 = resistant, 4 = susceptible) for the eight barley varieties grown at 14 centres. (t = trace = 0.5 for determination of means).

Several interesting points arise from the data as follows:

1. Mildew was important on the nursery in all areas except Ireland, Finland and Austria.
2. The resistance reactions of Akka, Tern, Sultan and Vada were exhibited in all areas.
3. Impala was susceptible to some degree in most areas showing the widespread occurrence of races in Europe with the two

virulence genes necessary to attack this variety. Other information also shows the existence of these races in East Germany, Czechoslovakia and Poland.

4. Impala tended to be less susceptible than the two varieties Concord and Zephyr which separately contain the two resistance genes, Ml_a 6 and Ml_g.
5. At most centres, Zephyr was equally or more susceptible than Concord. However, at Cambridge P.B.I., Backweston and Bruinisse, Concord was the more susceptible of the two. This may suggest a specialisation of races to particular varieties at different centres.
6. Even in the presence of virulent races, varieties which were previously resistant were generally less susceptible than the control variety, Kenia, with no resistance genes.

This project has been most useful in demonstrating the widespread importance of powdery mildew and revealing the general occurrence of Impala-virulent races. It is hoped that members will again be able to co-operate this year, using the same list of varieties. The particular interest is to observe the performance of Tern and Sultan since races have now been isolated in East Germany and England which will attack, to some extent, seedlings of these varieties.

It is also hoped that the nursery can be grown this year in Greece, Italy, Spain and Portugal.

The organisers would be grateful if, in addition to the nursery scores, some estimate of the general severity of barley mildew in the area could be given.

Many thanks for your co-operation.

