tinguish between single and multiple fetuses is being continued.

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Identification and Possible Origin of a Race of *Puccinia striiformis* isolated in 1966

SEVERE attacks of yellow rust (*Puccinia striiformis* Westend.) developed on the previously resistant winter wheat variety Rothwell Perdix in England in 1966. This variety was recently recommended by the National Institute of Agricultural Botany¹ as being high yielding and resistant to all known physiological races of *P. striiformis* occurring at that time in Great Britain.

The first reports of rust were received at the end of May, but the high degree of infection recorded then indicated that foci of the infection had survived throughout the winter. Later reports showed that the most severe infections were on crops in the south-east region, but some rust could be found at the ripening stage on Rothwell Perdix in most parts of the country.

It is interesting that crops of this variety became heavily infected in many areas during a short period of time, apparently by a physiological race not previously described. This pattern could suggest the influx of spores from a wheat growing area to the south of Great Britain. But there is no variety related to Rothwell Perdix grown on a large scale in southern Europe which could act as the selection screen and provide the source of inoculum of a race of *P. striiformis* with a combination of virulence factors able to infect Rothwell Perdix. The early onset of the heavy infection at several widespread foci strongly suggests overwintering in Britain.

The physiological races used in testing Rothwell Perdix as seedlings in the glasshouse, and as adult plants in the field, during the period 1961-65 were 2B, 2C, 5, 8B, 27/53, 54, 3/55 and 58. Rothwell Perdix was resistant to each of these races, always giving a 0-00 type reaction, although an occasional seedling (less than 2 per cent) was susceptible. A few plants with very slight (naturally occurring) infections were seen in the field at five N.I.A.B. trials centres: at Cockle Park in 1963, 1964 and 1965; at Terrington Experimental Husbandry Farm (E.H.F.) in 1962 and 1964; at Drayton E.H.F. and Rosemaund E.H.F. in 1962; and at Cambridge in 1963 and 1964. It is thought that all these field observations reflected the behaviour of the susceptible seedlings to known physiological races particularly because race 8B was isolated from some of these plants in 1965.

Three isolates of the rust obtained from Duxford, Toft and Trumpington in Cambridgeshire in 1966 were highly virulent on seedlings of Rothwell Perdix and many other varieties, including the majority of the international differential host varieties. Cappelle-Deprez, the most widely grown winter wheat in Great Britain, was not susceptible to these isolates. The reactions of the differ-

ential host varieties, which were similar for each isolate, are shown in comparison with those for certain other physiological races found in Great Britain during the past 14 years in Table 1.

Table 1. REACTIONS OF THE STANDARD DIFFERENTIAL HOST VARIETIES WHEN INOCULATED WITH FIVE RACES OF *P. striiformis* COMPARED WITH THOSE OF RACE 60

Varieties	Physiological race					60 (from Rothwell Perdix)
	8B	27/53	54	3/55	58	
Michigan Amber	IV	IV	IV	IV	IV	IV
Blé rouge d'Ecosse	IV	IV	IV	IV	IV	IV
Strubes Dickkopf	IV	IV	IV	IV	IV	IV
Webster	0-II	0-IV	0-II	0-IV	II-IV	IV
Holzapfels Früh	IV	II-IV	II-IV	IV	II-IV	IV
Vilmorin 23	0-I	0	0	IV	0	III-IV
Heines Kolben	0-II	0	IV	0	0	IV
Carstens Dickkopf V	0-II	IV	II-IV	0-IV	IV	III-IV
Spaldings Prolific	0-II	0	0	0	0	III-IV
Chinese 166	00	III-IV	00	00	III-IV	IV
Rouge prolifique	0-II	0	0-II	0	0	IV
barbu						
Hybrid 46 (reselected stock)	00	0	0	0	0-I	0
Cappelle-Deprez	0	0	0	IV	III-IV	0
Heines VII	IV	0	0-II (IV)	0-IV	0-I	IV

The race represented by the three isolates obtained in 1966 has quite different virulence characters from races previously occurring in Great Britain, and it is the only race which is virulent on the differentials Heines Kolben, Chinese 166 and Heines VII. This combination of virulence factors also differs from those of all the fifty-nine physiological races of *P. striiformis* described previously². Physiological race 60 is suggested as the name for this combination of virulence factors.

At this stage of the investigation the likely genetic origin of this new race can only be conjectured. Similarities with races 8B, 27/53 and 54, which infect respectively the specific differentials Heines VII, Chinese 166 and Heines Kolben, but which are unable to attack Rothwell Perdix, can be seen in Table 1. Race 60 is basically similar to race 27/53 but with the additional virulence factors able to overcome the resistance of Heines Kolben and Heines VII. In this respect it is similar to race 58, recently suggested by Macer³ to have arisen from race 27/53. It is also comparable with race 8B but has accumulated factors virulent against Heines Kolben and Chinese 166 or race 54 with additional virulence factors able to overcome the resistance of Chinese 166 and Heines VII. Any of these three races could be considered the genetical source of the variant, but only race 8B is known to be widespread in Great Britain. The other race frequently identified in 1964 by Stubbs and Fuchs⁴ is race 55. If this is regarded as a source of the variant, then simultaneous changes in virulence affecting three major resistance genes must be postulated. It would seem, therefore, most likely that race 8B could have given rise to the variant (race 60) in Great Britain.

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Effect of (2-Chloroethyl) Trimethylammonium Chloride on the Eriophyid Gall Mite *Cecidophyopsis ribis* Nal., and Three Fungus Diseases of Black Currant

THE eriophyid gall mite, *Cecidophyopsis ribis* Nal., the vector of the reversion virus, is the most important pest of black currants. The mites migrate to new buds during a period lasting 3-4 months, but individuals are rarely exposed, while on the plant, to contact acaricides for