

Table 1. Uptake of potassium ions (μ equiv. per gm. fresh weight) from solutions of different salts, and in the presence of tissue extracts, in 6 hr., at 25° C.

Solution	Uptake	S.E.
Potassium chloride	44.4 \pm 0.57	
Potassium malate	30.9 \pm 0.07	
Tissue extract + chloride	34.4 \pm 0.26	
Tissue extract + malate	29.7 \pm 0.18	

It is concluded that the apparent inhibitory effect of tissue extracts of red beet is mainly attributable to association of a proportion of the cations present with organic anions, which are absorbed more slowly than chloride and cause a retardation in the rate of uptake of cations.

In later experiments we have observed that extracts prepared from actively growing roots of the beet, and also from disks with a strong accumulatory ability, show inhibitory effects on cation uptake which are not significantly different from those exhibited by extracts from dormant roots. These observations indicate that the inhibition is without significance either in relation to the life-cycle of the beet plant, or to the development of an absorptive capacity in tissue disks.

One of us (J. E. D.) wishes to thank the Agricultural Research Council for permission to publish this communication.

J. E. DALE
J. F. SUTCLIFFE

Department of Botany,
King's College,
London, W.C.2. Sept. 30.

¹ Rees, W. J., and Skelding, A. D., *Nature*, **166**, 823 (1950). Skelding, A. D., and Rees, W. J., *Ann. Bot.*, N.S., **16**, 513 (1952).

² Sutcliffe, J. F., *J. Exp. Bot.*, **3**, 59 (1952).

³ Bennet-Clark, T. A., and Bexon, D., *New Phytol.*, **42**, 65 (1943).

Virulent Attacks of Eyespot on Oats

OATS, although known to be occasionally attacked by eyespot caused by *Cercospora herpotrichoides*, are generally regarded as very resistant to this disease, and hence are usually considered the safest crop to follow wheat or barley where intensive cereal cultivation is being carried on. In view of this statement, the following observations on disastrous attacks of *Cercospora herpotrichoides* on oats may be of interest.

During a survey of cereal crops in 1955 and the incidence of eyespot in Ireland, numerous crops of oats were reported as badly affected by lodging. A microscopical examination of specimens from eighteen crops confirmed the presence of *Cercospora herpotrichoides* as the causative agent, the take-all fungus *Ophiobolus graminis* being present in one sample. The lodged crops were widely distributed over twelve counties: in nine cases the number of affected plants was more than 80 per cent, and in some of these the entire crop had gone down; the remaining nine crops had lodged patches of varying extent.

All crops were spring sown, that is, in March or April, and the varieties were Victory, Sun II and Glasnevin Triumph, the rotation being:

- 1 crop oats, following three successive barley crops;
- 4 crops, each following three successive wheat crops;
- 3 crops, each following two successive wheat crops;
- 4 crops, each following one year wheat after ley;
- 2 crops, each following one year wheat after roots;
- 1 crop, the third successive crop of oats;
- 2 crops, each following wheat, no other particulars;
- 1 crop, no particulars.

Although typical eyespot lesions occurred to some extent on the oat plants, they were rather scanty;

but frequently an indented line was present on one or both sides of the culm. This indentation presented the appearance as if the culm had been pressed in with the thumb-nail, the dent extending up the plant from the base to a height of one to three inches, and sometimes causing a split in the culm. When such stems were cut longitudinally, the fungus was often visible to the naked eye in the central cavity, and, as a rule, more profusely developed than occurred in either affected wheat or barley.

This attack on oats was no doubt closely connected with the prevailing climatic factors. Weather conditions in the autumn of 1954 and the following winter were such as to preclude ploughing. March and April in 1955 were favourable for cultivation, but both May and June were wet. In fact, the last mentioned was the wettest June since 1928 and the nights were unusually cold. Rain fell early in July, but then the weather suddenly changed and came in exceptionally warm, and it continued so throughout August. Lodging of diseased crops commenced towards the end of the third week in July, and as the very warm weather continued, more and more cases were reported. The collapse of the plants was sudden and spectacular on many farms, lodging of most of the crop occurring within two or three days. As no rain had fallen during the previous three weeks in many districts, the occurrence naturally aroused the growers' interest. The various county instructors in agriculture were then consulted, and due acknowledgment is made to them for assisting in this investigation.

In a previous communication¹, Miss Glynne reported a severe attack of sharp eyespot on oats due to *Corticium solani*. We, however, are not aware of any record in plant pathological literature of widespread attacks of ordinary eyespot on oats such as described, and it would seem as if our views on the resistance and liability of oats to *Cercospora herpotrichoides* will have to be considerably modified.

R. MCKAY
J. B. LOUGHNANE
T. KAVANAGH

Department of Plant Pathology,
Albert Agricultural College,
Glasnevin, Dublin.

¹ Glynne, Mary D., *Nature*, **166**, 232 (1950).

Spawning of the Sardine at a Definite Time of Day

THE sardine is the principal food-fish of the lands bordering the Adriatic Sea. It is fished only from April to September, since it disappears from the fishing grounds from October to March. This period is the spawning time, when it migrates to regions hitherto unknown. The eggs float in the upper layers of the sea and are therefore found in the plankton. We have now been able to determine the spawning areas by means of systematic plankton studies throughout the Adriatic¹. In the course of this work, it was found that the sardine (*Sardina pilchardus*) spawns at a certain time of day, namely, in the evening. This is an extension of the finding of Ahlstrom² for the Californian sardine (*Sardinops caerulea*). Since the phenomenon seems to be unknown in other marine fishes, we think it worth while to describe our method and results.

Plankton samples were taken hourly for a period of 48 hr. at one spawning place on two occasions.