in the production of normal growths of shoots and leaves.

The results of chemical tests for zinc on leaves and shoots from comparable healthy and affected trees on the plot are given in the accompanying table.

A comparison of results obtained in *Aspergillus* tests on surface soils from a healthy apple plantation at Long Ashton and the affected plantation at Wisley is shown below.

Long Ashton soil	10 μ gm. Zn per gm. air-dry soil
Wisley soil	1-2 μ gm. „ „

The proof of a serious zinc deficiency problem in this Wisley soil, which has been treated in accordance with the usual manurial practice recommended for commercial fruit plantations, raises the question as to the extent to which zinc deficiency may be a limiting factor to tree growth on the widespread sand and gravel deposits of the surrounding district.

The experiments are being continued on apples, pears and stone fruits, and will be reported fully elsewhere.

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Effect of the *Striga* Germination Stimulant on the Respiration of *Striga* Seeds

It has been shown previously¹ that the natural stimulating substance which promotes the germination of the seeds of *Striga hermonthica* is capable of causing extension growth of pea root segments. Should this be the only function of this stimulating substance in the germination process of the seeds of *Striga hermonthica*, then it is difficult to account for some of its effects on *Striga* seeds.

Thus, when air-dry seeds of *Striga hermonthica* were treated with a solution of the stimulating substance, I found that subsequent germination under optimum conditions was almost completely inhibited. The nature of this inhibition has not yet been fully established; but several replicated experiments have shown that the stimulating solution has a marked effect on the respiration of *Striga* seeds. The accompanying figure shows the respiration of *Striga* seeds during a 12-hour period after the addition of distilled water, and after the addition of the stimulating solution to air-dry seeds. It will be seen from this figure

that the respiration of the seeds is markedly enhanced when they are placed in the stimulating solution, compared with that when they were in distilled water. This increase in the rate of respiration takes place at the expense of the sugar reserves of the seeds.

S, Respiration in the stimulating solution at 32° C.; D.W., respiration in distilled water at 32° C.

The respiration of the seeds of *Striga hermonthica* is also enhanced by the stimulating solution when the seeds are able to germinate. I first observed this during certain experiments in which 50 per cent of the seeds were induced to germinate after six days of moisture-treatment at 22° C., followed by exposure to the stimulating solution for forty-eight hours at 32° C. Studies on the respiration of the seeds during the first twelve hours of exposure to the stimulating solution, together with chemical analysis, showed that in this case the substrate for respiration is protein, and that there is no decrease in the rate of respiration after twelve hours.

Subsequent experiments have shown that the stimulating solution increases the rate of respiration of *Striga* seeds when they are treated with it after prior exposure to moisture for various times at various temperatures. Furthermore, I have not been able to correlate the increase in respiration due to the stimulating solution with the germination capacity of the seeds at any stage of after-ripening or moisture-treatment.

It seems, therefore, that the *Striga* germination substance enhances the rate of respiration of the seeds, as well as possibly causing root-extension under optimum conditions.

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