

Yams upon light porous soils in areas where the rainfall is relatively small may be left to trail their vines on the soil, for thereby the moisture in it is retained: but nowhere in the Malay Peninsula is the rainfall small enough to justify this: on the other hand the great room afforded for development by the use of stakes produces a greatly increased return. Experiments, demonstrating this increase, were performed twelve years ago in the island of St. Lucia, West Indies (*Agricultural Bulletin*, Barbados, VIII, April 3rd, 1909, p. 105). The results were as follows:—

Race of Yam	Return when not Staked	Return when Staked
"Lisbon"	3.2 tons per acre.	6.7 tons per acre.
"Bottle-neck Lisbon"	2.4 tons per acre.	4.3 tons per acre.

Since the above was written the following note has appeared in the *Agricultural News*, March 6th, 1920.

"A note in the *Agricultural News* February 8th, 1919, drew attention to an experiment conducted at the Botanic Station, Montserrat, in yam cultivation; as to whether it was profitable or not to provide stakes for the vines to run on. Mr. Robson, the Curator, came to the conclusion that the increased yield produced by the staked plants would more than pay for the increased cost involved.

"Mr. Robson has recently forwarded a note upon a similar trial carried out in 1919 with the results obtained therefrom, six rows of six different varieties of yam were planted on ordinary banks, to which pen manure had been supplied, 4 feet apart, the plants being three feet apart in the row. These rows were staked, and five rows unstaked were planted alongside as a control. The yams were planted on May 1st, 1919, and reaped on January 19, 1920. The results showed that in every case there was a large increase in yield from the staked rows as compared with the unstaked ones, amounting to more than 100 per cent. on the total yield, thus confirming the results obtained in 1918."

I. H. BURKILL.

Some Factors in Plant Competition.

A preliminary account of the results of experiments conducted at the Rothamsted Experimental station to ascertain the relative importance of the different factors that come into play when one plant enters into competition with another is given in "*The Annals of Applied Biology*", Vol. VI, Nos. 2 and 3.

"Competition of one plant with another is a very complex, not a simple, phenomenon, and may be broadly analysed as follows:

- (1) Competition for food from the soil.
- (2) Competition for water.
- (3) Competition for light.
- (4) The possible harmful effect due to toxic excretions from the roots, if such occur.

"The first three factors lend themselves to direct experiment; the fourth is more difficult to demonstrate but the possibility of its existence must be reckoned with in estimating results."

A summary of the work which was carried out with mustard and barley provides the following:

"The mutual action of one plant on another when growing in juxtaposition, usually known as competition, is a very complex phenomenon.

"When the food supply is limited the dominant factor of competition is that of food and in particular the amount of available nitrogen. Other things being equal the total growth as measured by the dry matter produced is determined by the nitrogen supply, irrespective of the number of plants drawing on the resources.

"With limited food supply the efficiency index of dry weight production decreases with the number of plants as the working capacity of the plant is limited by the quantity of material available for building up the tissues.

"The decrease in light caused by overcrowding is a most potent factor in competition even when an abundance of food and water is presented to each individual plant."

T. F. C.

Effect of Lightning on Trees.

The question as to what extent groups of trees are effected by lightning and how far the damage extends after they have been struck is frequently discussed on estates where apprehension is often felt as to how wide a circle from the tree actually struck will be affected. The following extract taken from the *Indian Forester* Vol. XLVI, No. 3. contains interesting observations on this subject.

"Lightning-struck trees may be found surrounded by others which show no signs of having been struck at all, and trees standing only 4 ft. away from a tree may thus escape. On the other hand several trees standing close together are usually all more or less similarly affected. Of a number of records which I have of the maximum distance apart of any two trees struck in the same locality the four greatest distances are 50", 36", 35" and 33".

"Young chir advance growth and small woody shrubs have been found killed within a circle up to 18 feet radius round the base of a lightning-struck tree, but it is more frequent to find such shrubby growth apparently unaffected and I have no record of herbaceous growth showing any signs of damage at all. It is of course well known that the taller an object is the more likely it is to be struck, and it would therefore be unnatural to expect to find shrubby growth affected to the same extent as trees standing overhead.

"As a matter of fact I believe that only a very small percentage indeed of trees struck would die if other agencies did not combine to complete their destruction. Overmature tree with decreasing vitality might succumb but not healthy sound trees in full vigour. From general observations which are not, however, based on definite countings, I believe that under existing conditions about 50 per cent of trees struck (namely, so severely as to give clear