instead of restricting themselves to what is based on strong evidence.

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TRANSMISSION OF COWPEA MOSAIC BY THE BEAN LEAF-BEETLE

OBSERVATIONS on the occurrence of the bean leaf-beetle (*Ceratoma trifurcata* Forst.) indicate that this insect may be responsible for the spread of cowpea mosaic, a little understood but serious disease of cowpeas. This disease, which is now known to be present in Louisiana, Arkansas and Indiana, causes mottling and crinkling of the cowpea leaves. The injury is similar to that found on most other mosaic-affected, dicotyledonous plants, the leaves being greatly distorted and the internodes shortened.

Insects associated in greatest numbers with cowpea plantings showing disease included the bean leaf-beetle (*Ceratoma trifurcata* Forst.), the belted cucumber beetle (*Diabrotica balteata* Lec.), the green stink-bug (*Nezara viridula* L.), and the alfalfa-infesting treehopper (*Stictocephala festina* Say).

Preliminary experiments during 1921 proved that the bean leaf-beetle transmitted the disease, while tests with the green stink-bug and the treehopper were negative. Additional experiments performed in 1922 and 1923 further demonstrated that the bean leaf-beetle is a definite and efficient carrier of cowpea mosaic.

It was established that insects which had fed for one day on diseased plants and were then transferred to healthy plants transmitted the disease in practically every case. Beetles retained as controls and confined on healthy plants did not transmit the disease when transferred to other healthy plants. Some infection of healthy plants was obtained by inoculation with regurgitated juice or abdominal contents from beetles which had previously fed on diseased plants.

Unmistakable symptoms of the disease were found to appear on healthy plants within five days after the beetles had been introduced into the cages containing these plants, but the average period throughout the season was seven days. In a few cases mosaic appeared on leaves which were very small at the time of inoculation, but as a general rule, only foliage appearing subsequent to inoculation developed readily recognizable symptoms of the disease.

Some artificial transmission of the disease was accomplished by rubbing the leaves of diseased and healthy plants together. In a limited number of experiments mosaic was readily transmitted from diseased to healthy plants by inoculation with a needle.

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ALKALINE REACTION OF THE COTTON PLANT

MR. C. M. SMITH in an article, "Excretions from the leaf as a factor in arsenical injury to plants," read before the New Haven meeting of the American Chemical Society, has pointed out that dew collected from the cotton plant is alkaline.

It seemed possible to the writer that this alkalinity was connected in some way with the attraction of the cotton plant for the boll weevil. The following experiments were therefore tried.

The leaves and stems of young cotton plants were crushed and immersed in water containing a few drops of phenol-phthalein. No apparent alkalinity was produced. (Distilled water was not available.)

When the unbruised plant was placed in the water containing the phenol-phthalein it was found that the under side of the leaf, the tender buds and very tender stems showed an alkaline reaction distinctly apparent by the almost immediate change in color of the phenol-phthalein adjacent thereto. No evidence of such alkalinity could be observed on the upper side of the leaf nor on the older parts of the stems, etc.

The solution of the alkaline substance in the water was apparently heavier than the water, as a distinct tendency for the purplish color to sink was noted.

On exposure of the under side of the leaf to the sun for some hours no apparent diminution in the alkalinity of the under side of the leaf took place.

Some thirty or forty different kinds of leaves were next tried in the same way. Similar, though much less, alkalinity was noted only in the case of leaves from okra. Since the okra is related to the cotton plant and since the boll weevil can be forced to feed upon this plant, some significance may attach to that fact. It is known, however, that certain other plants are known to form alkaline substances.

It was not possible at the time to attempt to identify the nature of the alkaline substances. Nor were forms, blooms or bolls available. Even the possibility of selective adsorption having produced the apparent alkalinity was not excluded.

Mr. Smith seems to think that there is something in his analysis of the dew (showing calcium and magnesium carbonates and bicarbonates) to account for the alkalinity observed. Since both acid and normal alkaline earth carbonates are neutral to phenol-phthalein, this would hardly seem possible. Alkali carbonates, if present, would cause alkalinity. Careful examination should be made for the presence of an organic alkaline compound and to find if the alkalinity observed has anything to do with the preference of the boll weevil for the cotton plant.

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