Fungous Enemies of the Sweet Potato in Indiana.

By C. A. Ludwig.

In the spring of 1911, the writer began an investigation to determine the causal organism of a dry rot which does damage to sweet potatoes in storage at his home in Franklin County, Indiana. The work was continued the following winter as thesis work for a baccalaureate degree at Purdue University; and as no special study of the fungi affecting sweet potatoes in Indiana could be found, the subject was enlarged in scope to take in all the fungi of Indiana which are known to affect stored sweet potatoes. A number of forms which have been suggested as the cause of decay, and some not thus previously associated have been studied; and certain notes concerning them may not be without interest, in spite of the fact that the primary cause of the dry rot still remains in doubt. The work was carried on in the botanical laboratories of the Purdue Agricultural Experiment Station, and the writer wishes to acknowledge his indebtedness to the members of the botanical staff and to a number of other friends for various assistance.

The following fungi were found to affect stored sweet potatoes in Indiana:

Phycomycetes.

Rhizopus spp.

Ascomycetes.

Nectria Ipomoea Hals.

Penicillium spp.

Diaporthe batatatis Harter and Field.

Fungi Imperfecti

Sphaeronema fimbriatum (Ell. and Hals.) Sacc.

Fusarium spp.

Rhizopus nigricans Ehr. is the cause of a soft rot of sweet potatoes when they are kept too damp. It was determined as the cause of soft rot in some specimens from Tippecanoe County. Some other species of *Rhizopus* were also isolated from potatoes affected with soft rot, a circumstance which makes it probable that they may also be the cause of a soft rot when conditions are favorable for their growth.

Nectria Ipomœæ Hals.[1] has been observed in the vicinity of Bloomington, Ind., by Prof. J. M. Van Hook, of Indiana University. It is supposed to cause a stem and root rot of sweet potatoes in the field, a root rot in storage, and a stem rot of egg-plant in the field.

Penicillium spp. The prevalence of these fungi renders their attacks frequent. They are usually superficial, but may, however, penetrate more deeply, especially under conditions of considerable moisture. A wound of some sort is usually a further necessity for such an infection.

Diaporthe batatatis Harter and Field. This is the organism originally described as *Phoma Batatæ* Ell. and Hals.[2] Harter and Field have recently secured the ascigerous stage and have named the organism.[3] It was isolated several times from sweet potatoes raised in Tippecanoe County. The culture was determined by Mr. L. L. Harter, of the Bureau of Plant Industry. This appears to be the first time the species has been reported in Indiana. It is not listed in the report of the Biological Survey of the Academy in the Proceedings for 1893, nor, so far as I have been able to find, in the additions since.

Sphæronema fimbriatum (Ell. and Hals.) Sacc., This organism causes the disease known as "black shank." It was not found during the course of this work, but was reported in the 1907 Yearbook of the Department of Agriculture as having been present in this state during that year.

Fusarium spp. During the course of the work several species of *Fusarium* were isolated and studied. Some species are common members of the flora of decaying sweet potatoes, and the results indicate that one or more of them is partially responsible for the decayed condition. However, as the point has not been fully demonstrated, it seems best not to discuss it more fully here.

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[1] Halsted, B. D. The Egg-plant Stem Rot. N. J. Exp. Sta. Rept. 12, pp. 281-283. 1891.

[2] Halsted, B. D. Some Fungous Diseases of the Sweet Potato. N. J. Exp. Sta. Bull. 76, pp. 23-25. 1890.

[3] Harter, L. L., and Field, Ethel C. Diaporthe, the Ascogenous Form of Sweet Potato Dry Rot. Phytopathology, Vol. II, No. 3, pp. 121-124. June, 1912.

[4] Halsted, B. D., and Fairchild, D. G. Sweet Potato Black Rot. Jour. Myc. 7, pp. 1-11, pls. 1-3. 1891.

Halsted, B. D. Some Fungous Diseases of the Sweet Potato. N. J. Exp. Sta. Bull. 76, pp. 8-14. 1890.