

Assessment of the Importance of Root-knot Nematodes and Northern Corn Leaf Blight in Corn in Arkansas

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Corn production does not have as long of a history in Arkansas as many other row crops, such as rice, cotton and soybean, and thus information is needed about how to manage diseases and nematodes to maximize profitability. Previous research supported by the Arkansas Corn and Sorghum Promotion Board showed that several foliar diseases of corn, particularly Northern Corn Leaf Blight and Southern Rust, can be severe in Arkansas at a local or state-wide level, depending on weather and other factors. More importantly, foliar diseases can significantly reduce yield in the state, and thus profitability, if not managed properly. Another important concern for Arkansas growers is the potential impact of corn production on plant-parasitic nematodes within the state. We know from experiences in other states that nematodes such as lesion, lance, root-knot, and stubby-root can reduce corn yields, but we do not know if Arkansas soil types and environment will ultimately promote or suppress nematode problems in corn. Based on research in Arkansas, we do know that much of the corn grown in the state is susceptible to, but relatively tolerant of, the southern root-knot nematode, *Meloidogyne incognita*, our most economically important nematode species. Because root-knot nematode populations increase when corn is grown, this poses a considerable risk to rotation crops such as soybean or cotton.

In this three-year project (2011-2013), we are 1) studying the impacts of foliar diseases on Arkansas corn production, particularly Northern Corn Leaf Blight and Southern Rust, 2) measuring the impact of corn production on nematode populations, and 3) creating resources and management recommendations that are designed specifically for corn production in all regions of the state. One component of this effort is creating a disease nursery at the Newport Branch Station in Jackson County, in which corn hybrids popular with Arkansas growers can be evaluated for resistance, and management strategies can be developed in a controlled environment. For this type of research, relying on naturally-occurring disease for hybrid evaluations is risky since disease may not develop where variety trials have been planted. Related to this effort, we are evaluating whether fungicide resistance is emerging in corn diseases. Although fungicides are fairly effective now, there is reason for concern that fungicide resistance may be developing in parts of the U.S., as has been the case recently for Frogeye Leaf Spot in soybean in Arkansas. Additionally, rotation experiments with corn and soybean are ongoing, in which the impact of nematodes on corn yields is being measured, and equally as important, the impact on rotation crops is being determined as well.

As this project progresses, we will use the information obtained to develop specific management recommendations for the problems being studied. This information will provide growers guidance regarding the most efficient and cost-effective ways to control disease problems in Arkansas corn production systems. Optimizing management recommendations for foliar diseases and nematode problems will increase the profitability of corn production in Arkansas and help to reduce the impact of "disease surprises" in the state.