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NEWS RELEASE

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Crop Rotations as a Method of Disease Control

There are many control methods available to growers that can help to reduce the chance of developing a disease on their crop. Some of these are cultural control methods that aim at eliminating or reducing the amount of the pathogen present in the field. One old, but practical method that most growers are well aware of and frequently use is crop rotation. However, like all pest control methods, it needs to be understood how it works and used correctly to get the most out of this technique.

The goal of crop rotation is to reduce the amount of the pest population present in the soil. Some pathogens that cause diseases survive in the soil from year to year in one form or the other, usually as sclerotia, spores, or hyphae. Continuously cropping the same crop builds up the population levels of any soil borne pathogen of that crop that may be present. The populations can potentially build up so large that it becomes difficult to grow that crop without yield losses. But by growing a crop that is not a host plant for that pathogen will lead to the pathogen dying out and its soil population levels lowering. Most pest populations will decline in 2 to 3 years without a suitable host. Rotating to non-host crops prevents the buildup of large populations of pathogens.

However, there are a few factors that limit the effectiveness of crop rotations. These factors really need to be considered before rotating into another crop. First, plants that belong to the same family often share the same pest problems. Therefore, using crops that are closely related to rotate with will likely not achieve the goal of reducing pathogen levels in the soil. The botanical classification should be looked at when considering which crop to rotate with. As an

example, even though broccoli, cabbage, turnips, and mustard greens appear very different from another, they all belong to the mustard family (Brassicaceae). Therefore, they all share some common pest problems. Rotating between these plants will not reduce any disease problems that may be occurring. In fact it will increase the chance of problems with soil borne diseases such as black leg, black rot, Fusarium yellows, and clubroot which these crops all have in common. Rotating to crops from other than those in the mustard family would help to reduce the pest populations in the soil.

Another factor that needs to be considered is crop rotation is not a very effective practice on pathogens that have a wide host range. Examples of these would be *Rhizoctoinia solani*, *Sclerotium rolfsii*, and *Pythium* species. These pests have such a wide host range that it would be difficult to find a suitable crop to rotate with. Crop rotations need to be especially carefully selected to reduce pathogens such as these. Usually small grains can be used.

Lastly, some pests produce resting structures that are able to survive in the soil for long periods of time. Rotations of 3 to 5 years may have very little effect on the population levels in the soil of certain pests. Clubroot of Crucifers can persist in the soil for 7 years while white rot of Alliums can easily survive as sclerotia in the soil for over 50 years and still infect onions and garlic. Luckily most pathogens with long soil resting structures have narrow host ranges so alternative crops can be grown.

Even though crop rotation is a proven method of disease control with a long history of use, growers and consultants should still carefully look at its use. Rotating crop plants not related botanically will help insure that nonhost crops are being used. Some pest problems have such a wide host range or are able to survive in the soil for such long periods that other methods of control need to be considered. Crop rotation is still one of the best, widely practiced, and cost effective methods of disease prevention. ■