



Can Planting Corn Later Affect Disease Risk?

To increase the potential for maximizing yield, most producers seek to plant corn when soil temperatures and conditions are adequate for both germination and planter operation. However, planting can be delayed either by the environment or deliberately by the producer for management reasons. The delay in planting and subsequent delay in plant development can influence the impact of plant diseases and insect pests.

Corn Seed and Seedling Pathogens

The major corn seed and seedling pathogens include *Pythium*, *Fusarium*, *Rhizoctonia*, and *Diplodia*. Generally, the potential for these diseases to develop increases when soils are wet and cold. However, *Rhizoctonia* favors warmer soils. The result can be seed decay, stunted plants, or plant death. Environmental stress later in the growing season can increase the possibility of diminished plant health or death because of a smaller root system.

Can a delay in planting until drier and warmer conditions occur reduce the incidence of seedling diseases?

Yes. However, planting corn outside the optimum window in your area may result in lower yield potential. The standard recommendation is to plant corn when the soil conditions are adequate for good planter operation (collapsing seed furrow) and soil temperatures at the 2-inch depth are near and holding around 50°F. Seed protected with labeled fungicide seed treatments for these pathogens can help protect seed during adverse environmental conditions. Delaying planting can also impact some seed and seedling feeding insects. Wireworm, corn seed beetle, and corn seed maggot injury occur more often when soils are cold and wet. The incidence for injury from these insects may be reduced by planting later when soil conditions have improved (warmer and drier).

What happens if it is relatively warm but still wet, can that result in seedling disease?

In general, the potential for infection from *Fusarium*, *Rhizoctonia*, and *Diplodia* is likely reduced. However, several species of *Pythium* can infect plants over a range of temperatures and moisture is the key environmental factor with this disease. Additionally, the potential for *Rhizoctonia* development increases when soil temperatures are between 77 and 85°F.

Foliar Diseases

Keep the disease triangle in mind. For plant diseases to develop, three things must be aligned: 1) Presence of the pathogen; 2). Susceptible host plant; and 3). Suitable environment for infection and spread. Therefore, delayed planting may have a positive or negative effect on foliar disease. In situations where planting is delayed and the environment is suitable for a plant disease to infect at an earlier growth stage, the impact on yield potential can be considerable. The early infection decreases the ability of the plant to photosynthesize over a longer period. This is particularly true when the plant is infected early, and the conditions continue to favor disease propagation for a long period of time. In addition, growing season stress from foliar disease may increase susceptibility of the plant to root and stalk rots.

What foliar diseases are most likely to develop when planting is delayed?

As discussed above, it depends on if the infection occurs early in the plant development and continues through plant maturity. Host plant tolerance or resistance to infection for some of the more common diseases, like northern corn leaf blight, grey leaf spot, and rusts is available, and your seed provider can provide recommendations if there is concern with infection. A word of caution, because some diseases do not overwinter in northern areas, tolerance or

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resistance to some of these diseases has not bred into corn products for that maturity zone, so planting earlier maturing products in more southern areas may result in significant infection. The emergence of newer diseases, tar spot for example, in the central Corn Belt maybe more of an issue as resistant or tolerant products may not yet be available.

Under “normal” conditions, foliar diseases such as northern corn leaf spot, grey leaf spot, and southern rust are not an economic concern early in the season as environmental conditions are not suitable for expansion of the disease or the spores have not arrived in the northern areas. More often, the potential for foliar disease development and economic concern increases after pollination. However, when planting is delayed, infection can occur at a much earlier growth stage when it coincides with favorable environmental conditions for a disease. This can result in greater injury to upper leaves over a longer period, reducing the ability of the plant to complete grain fill.

If that is the case, should a fungicide be applied at an earlier growth stage or should it be applied at tasseling or the R1 growth stage?

That will depend on if the plant is infected, environmental conditions are suitable for infection and spread, and if the corn product is susceptible. The Ohio State University Extension conducted a study that mimicked this scenario and found applications at VT/R1 growth stages provided the most consistent positive response to yield and disease suppression. While earlier applications did provide a yield increase it was lower and inconsistent across years.¹

Sources

¹ Paul, P. 2019. Disease risks in late-planted corn. Ohio State University Extension. <https://ocj.com/2019/07/disease-risks-in-late-planted-corn/>.

Legal Statements

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Performance may vary, from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower’s fields.

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