

Crop Rotation and Replant Considerations with Herbicides

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Crop rotation and replant restrictions for herbicides are extremely important to follow prior to planting. One of the desired characteristics of a herbicide can often be residual activity for weed control. However, this characteristic can also cause some headaches if the rotation restrictions are not followed. Herbicides need sufficient time to dissipate or breakdown prior to planting crops that are more susceptible to that herbicide. For example, 1 pt/A of **2,4-D ester** can be an extremely valuable tool for burndown applications prior to planting soybean. However, for this application to be safe to soybean, 2,4-D ester needs to be applied 7 days prior to planting soybean. The restriction or days to planting is longer for higher rates of 2,4-D ester and even different formulations (amine formulations) of 2,4-D. The restriction is 15 days between an application of 1 pt/A of 2,4-D amine and soybean planting and is as much as 30 days if the application rate is higher than 1 pt/A.

There are several factors that influence the dissipation of a herbicide in the soil. These factors include: 1) the herbicide's ability to persist in the soil, 2) the amount of rainfall or soil moisture available for degradation, 3) soil temperature, and 4) soil pH. Although these factors all influence herbicide persistence, certain factors are more important than others for specific herbicide chemistries.

Herbicide Persistence

First of all, it is always important to know what products were applied in the field, how long these products persist, and what rotational crops are sensitive to soil residues. Different herbicides persist in the soil different lengths of time. It is important to know when a product was applied to determine the time the product has been available for degradation. For example, the atrazine label indicates that soybeans can be planted the following year if applications were made before June 10 of the previous year. This rotational restriction was made to ensure that there was sufficient time for atrazine to degrade between application and soybean planting the following year.

Soil Moisture and Temperature

Other factors to consider include the amount of precipitation received following application and soil temperatures. Dry soil conditions generally reduce the rate of herbicide degradation. Soil moisture is extremely important, especially during the first 2 to 4 weeks after application. If rainfall and soil moisture are not sufficient, dissipation of the herbicide will most likely be reduced, ultimately increasing the potential problem for the following crop. Additionally, lack of soil moisture can result in increased herbicide

adsorption to soil particles and organic matter, reducing herbicide availability for degradation. Soil temperature also plays an important role in herbicide degradation. Colder soil temperatures can decrease herbicide degradation. That is why certain herbicides are not used in Michigan.

Soil pH

Soil pH affects the persistence and degradation of many herbicides. In particular, high soil pH (above 7.0) reduces the dissipation of atrazine and simazine. Also, dissipation of *chlorimuron*-containing products (Classic, Canopy, Canopy EX, and Synchrony XP) is reduced if the soil pH is greater than 7.0, increasing the likelihood of persistence. Clomazone (Command) dissipation is reduced by soil pH levels less than or equal to 5.9, increasing the chances of carryover to corn the following year.

Information on Crop Rotation Restrictions

To avoid problems due to herbicide carryover it is always important to follow the crop rotation restrictions that are found on the herbicide label. Additionally, this information can be found and is summarized in [Table 12](#) of the *2007 Weed Control Guide for Field Crops*. If you are still concerned about the potential for carryover, field or greenhouse bioassays can be conducted to help determine potential carryover problems. These bioassays are generally inexpensive and will help estimate the potential for rotational crop injury from herbicide residues.