

Late-Season Scouting – Why are Weeds Present in a Field??

By Jeff Stachler – NDSU and U. of Minnesota

The presence of weeds late into the growing season can be caused by many things. The following list represents potential causes of weeds being present late in the growing season:

1. **Sprayer skips.** Caused by skips between sprayer passes or near end-rows/head-lands and from plugged nozzles. In these skipped areas any weed species capable to be in the field may be present. All individual plants in the skipped area should look normal and healthy, unless some plants received a small dosage of herbicide. These areas generally are small and infrequent.
2. **Selection of an incorrect herbicide.** Some herbicides are extremely selective. If an herbicide is not effective on a particular weed species, then it will survive the herbicide application. The level of susceptibility will determine the length of time of injury symptoms. Plants throughout the field will survive an application of an ineffective herbicide. There may be differences in response between plants within the field, but it should be minimal.
3. **Poor environment at time of postemergence herbicide application.** Weed species may survive an herbicide application if temperatures are too cool (most likely) or too hot (usually not, especially glyphosate, but possible under extreme temperatures), relative humidity is very low, soil moisture is excessive or lacking, poor fertility, or plants are under stress for other reasons. Those species present in the field that are the most difficult to control with the herbicide being applied are the ones most likely to be present. All species may be present if conditions were really poor at the time of application. A high percentage (40 to 100%) of plants within the population of the most difficult to control species are likely to survive when an application occurs under poor environmental conditions. Individual plant response can differ between plants within the field, but likely will be fairly similar. Plant survival should occur throughout the field or in the areas of the field where the poor environment occurs.
4. **Too short of rain-free period.** All postemergence herbicides require some minimum period of time between application and rainfall to achieve maximum weed control. Rain-free periods for herbicides range from 0.5 to 8 hours after application. If this time period is too short, then plants can survive the herbicide application. Those species most difficult to control with the herbicide will be the ones most likely to survive. A high percentage (40 to 100%) of individual plants within the population of the most difficult to control species are likely to survive with a short rain-free period. The most surviving plants will be in the part of the field with the shortest rain-free period. There may be differences in response between individual plants within the field, but it is likely to be minimal. Lambsquarters is most likely to survive glyphosate if rainfall is received too soon after application. The greater (> 6 hours) the rainfree period, the better.
5. **Dust/soil on plant leaves.** All postemergence herbicides may be affected by too much soil on plant leaves. However, glyphosate, paraquat, and Ignite/Liberty are most effected my just small amounts of dust. The most difficult to control species with the herbicide being applied will be the most likely to survive the application. The highest dust areas of the field, typically the area near the sprayer tracks, will have the greatest number of surviving plants. A wide range in individual plant response to the herbicide is likely.
6. **Late-season weed emergence.** Two major causes of late-season weed emergence include a reduced crop canopy and the application of an herbicide prior to crop canopy closure having limited or no residual herbicidal activity. The greater the reduction in crop canopy, the more likely weeds are to emerge later into the season, especially pigweed species, waterhemp, giant ragweed, and grass species. The greater the sunlight reaching the soil surface, the greater the

weed emergence compared to a dense crop canopy that reduces sunlight exposure to the soil surface. A reduced crop canopy may be caused by reduced crop plant population or reduced crop growth due to excessive water, lack of water, disease, insects, crop injury (herbicide, hail, other), or early-season weed competition. Individual plants should look normal and usually are not limited in their growth. Multiple species are likely to be present. Late-season emerging species such as pigweed, waterhemp, giant ragweed, sunflower, common cocklebur, annual grasses, and nightshade are most likely to be present. Weeds will be found in patches **where** the crop canopy is reduced most or throughout the field in the case of an herbicide application applied prior to crop canopy closure.

7. **Herbicide resistance.** Individual plants within a population/field may survive the herbicide application. If resistance is caught early enough, few plants may be found scattered throughout the field or found in higher densities in small patches. In subsequent seasons, if the same herbicide is applied, the number of resistant plants will increase in the population and will become more numerous and scattered throughout the field. Plants having a high level of resistance to ACCase-, ALS-, and/or photosynthetic-inhibiting herbicides are likely to have a high frequency of plants appearing normal. Therefore individual plants are either dead or normal in growth with few individuals having a range in response to the herbicide. Plants having a low level of resistance to glyphosate, PPO-inhibiting herbicides, or plant growth regulating herbicides are likely to have a complete continuum of herbicidal response. Therefore plants will be dead, have normal growth but will **ALWAYS** be stunted, and show all types of responses between death and normal growth. Another type of response indicating low-level resistance is when individual plants are dead, have a dead main meristem with axillary growth, or have a main meristem with perfectly normal growth. The lower the level of resistance the greater the herbicidal activity and the greater the response differences. The pictures below demonstrate this type of response 10 to 21 days after application for common ragweed (first picture) and beyond 28 days after a late-season application to waterhemp (second picture). Usually (if resistance is caught early enough) the majority of individual plants will be controlled by the herbicide application with few plants surviving. The areas of a field having the greatest stress upon weed growth and having the greatest weed density are usually the areas in which resistant plants are first selected.



