ROUNDUP READY PLUS®
CROP MANAGEMENT SOLUTIONS

Considerations for Burndown and Early Season Weed Management

What You'll Learn...

- Early emerging weeds may potentially cause significant yield loss if not controlled.
- Burndown herbicide applications are an essential part of weed management in crop production.
- Environmental conditions affect herbicide performance, weed susceptibility to herbicides, and crop development.
- Sequential herbicide applications combining different sites of action, and foliar and residual activity provide the most effective weed management plans.

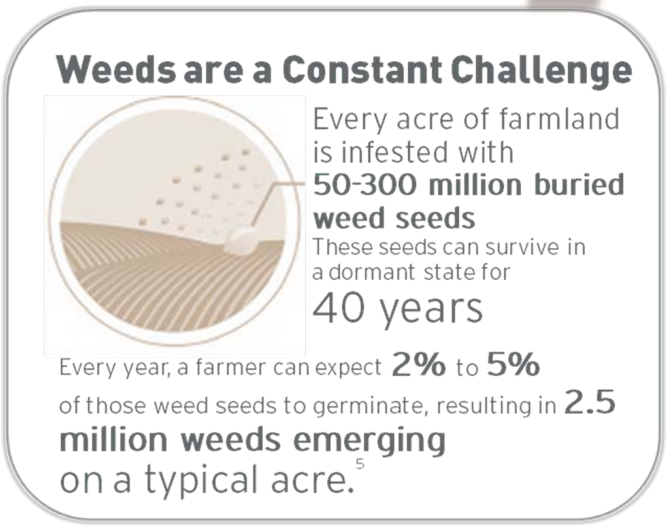
Importance of Early Weed Control

Weeds are most competitive with crops when they emerge prior to or at planting. A significant portion of yield is at risk if early emerging weeds are allowed to compete with crops during the first several weeks after planting.[1] If not controlled, they can also decrease harvest efficiency and produce seed which can impact future crops. The timing and intensity of weed emergence determines which species will be the most competitive with the crop as not all weed species compete equally. The emergence patterns of different species remain relatively consistent between species, but weed emergence profiles may vary from year to year depending upon environmental conditions, crop planting dates, and other management practices. The unique emergence profile for each weed species is defined by the initial emergence date, the duration of emergence, and the distribution of emergence within this time period. The presence of early emerging weeds generates several questions important for good weed management:

- Will a burndown application need multiple herbicides including a residual?
- Will the residual persist long enough before a post-emergence application can be made?
- What herbicide sites of action and residual activity will be needed to control weed escapes and late emerging weeds?

Timing

Ideally, weeds should be controlled at least a couple of weeks prior to planting, to allow for decomposition of the plant material. Planting into existing weeds, or heavy weed residue that has not had time to decay, can interfere with seed placement and reduce emergence due to poor seed-to-soil contact. If the burndown is delayed, planters should be adjusted to compensate for the increased residue.



The emergence profiles of weeds in a field significantly affect the performance of weed management programs and should be a major consideration for planning. In addition to starting with a clean field, removing weeds after planting when weeds are less than 4 inches tall is necessary to preserve yield potential. For example, university research shows an average of 3 bushel per day of yield potential is at risk for every day 3 to 4 inch weeds are left uncontrolled after V3 to V4 stage corn.[2]

Burndown Applications

Starting with clean fields at planting is an essential step for proper weed management.

- Preplant burndown tank mixtures remove early weed infestations and provide broad spectrum foliar and residual weed control.
- Dicamba or 2,4-D may be required in burndown tank mixtures for tough to control weeds. Both products have planting interval restrictions of a week or more between application and the planting of corn or soybean.
- Consult individual product labels for precise instructions.

A burndown plus residual herbicide tank mix, or tillage, may be required to remove early weed infestations.

- Residual herbicides applied with burndown several weeks prior to planting may encounter environmental conditions that limit residual activity into the growing season.

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Considerations for Burndown... (continued)

- An earlier than normal post herbicide application may be required to limit weed competition.
- The early post application requires a residual component to control late emerging weeds that impact yield potential.
- Residual herbicides have planting interval or crop rotation restrictions and precautions that need consideration if conditions warrant a change in planting intentions.
- Consult individual product labels for precise instructions.

Tank mixed herbicides, with different sites of action, may cause antagonism that affects performance. For example, a fast acting contact herbicide can interfere with the uptake and translocation of a systemic herbicide by quickly shutting down weed growth. Higher herbicide use rates, ammonium sulfate, or adjuvants can help overcome antagonism. Ammonium sulfate (AMS) has been shown to be an effective additive to condition hard water by deactivating antagonist salts (iron, zinc, calcium, magnesium, sodium, potassium[4]), prevent the binding of herbicides to soil particles on leaf surfaces, and improve foliar uptake. Some herbicides restrict the use of AMS. Herbicide labels should be checked for all additive rates and restrictions.

Fertilizer components and higher preplant spray volumes may also reduce herbicide activity, requiring higher herbicide use rates.

Environmental Factors

Environmental conditions affect the rate of weed growth, crop development, crop tolerance to herbicides, and herbicide performance. Fluctuating day and night temperatures are typical in the spring. The efficacy of a burndown herbicide application can be reduced by cold temperatures. It is recommended to wait on applying herbicides until nighttime temperatures are above 40°F and daytime temperatures are in the high 50's to low 60's.[1] Weed control may be even more effective if there are several days of warmer weather prior to herbicide applications rather than applying on the first warm day of the season.

Low overnight temperatures and slow warming during the day can reduce the rate of weed development. Seedling weeds tend to be more susceptible to soil-applied herbicides under cool conditions because plant emergence is delayed and metabolism is slowed. Slower weed growth caused by heat, drought, or cold also affects herbicide uptake, translocation, and metabolism that may reduce performance of post applied herbicides. The best way to limit problems related to warm, dry, or adverse conditions is timely application to small weeds rather than equipment adjustments.[3] Usually, postponing herbicide application is risky because changing weather conditions may delay application until weeds exceed optimum size for good herbicide performance. Most herbicide labels contain statements regarding environmental influences on herbicide performance.

Treatment Recommendations

Scout fields and control weeds throughout the season. Proper application timing that helps protect yield potential, ensures correct use rate for weed size, and considers the impact of environmental conditions on performance.

Weed management tactics for tough - to- control weeds such as marestail, giant ragweed, kochia, lambsquarters, *Amaranthus* species, and others can be found at http://www.roundupreadyPLUS.com.

Sources: [1] Pocock, J. 2011. 5 Tips For Corn Weed Management | Start With a Clean Field – Then Control Weeds Early as They Reach 4 Inches. Corn and Soybean Digest. [2] Hartzler, R. 2003. Is Your Weed Management Program Reducing Your Economic Return? Iowa State University Weed Science online www.weeds.iastate.edu (verified 12/09/2013). [3] Hartzler, R. 2006. Understanding Glyphosate to Increase Performance. www.ces.purdue.edu (verified 12/09/2013). [4] Nalewaja, J.D. and R. Matysiak. 1991. Salt antagonism of glyphosate. Weed Science 39: 622-629. [5]Pesticides are vital to maintain high crop yields. Poster. Crop Life Foundation. http://www.crolifefoundation.org.

THIS DOCUMENT IS INTENDED TO PROVIDE INFORMATION ABOUT THIS WEED AND GUIDELINES FOR CONTROL. AS A TOUGH-TO-CONTROL WEED, KNOWLEDGE ABOUT THE BIOLOGY AND WEED CONTROL PROGRAMS WILL HELP IN THEIR MANAGEMENT.