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CURRENT NEWS AND UPDATES

Weeds that are resistant to herbicides are not new. Farmers have successfully managed these challenges from many years. In fact glyphosate based herbicides like Roundup® agricultural herbicides used in conjunction with Roundup Ready® crops have been an effective tool in meeting this challenge. Recently, the University of Guelph has confirmed the presence of glyphosate-resistant giant ragweed and glyphosate-resistant Canada fleabane in fields in southwestern Ontario. In our research collaboration with the University of Guelph we are identifying alternative weed management solutions to control these weeds in our key crops of corn, soybeans, and wheat. The good news is there are solutions to control these weeds; the challenge is to communicate these best management recommendations to farmers.

We are raising our voice in this area to more clearly describe the weed management recommendation for corn and soybeans that contain the Roundup ready trait, as well as define our recommendations to manage the glyphosate resistant populations of Canada fleabane and giant ragweed. Our stewardship recommendations to 'start clean and stay clean' remain relevant and important in your weed management strategies. This includes: practicing good agronomics, applying the right rate at the right time, adding herbicides with different modes of action to your weed control program, and scouting fields for weed escapes and keep equipment clean.

I'm confident famers will effectively manage glyphosate-resistant weeds using the tools of today and adopting new strategies with technologies in the future. Ask your DEKALB® agronomist for the latest information for our best management practices for weed management and for specific information of Canada fleabane and giant ragweed. Taking action now will help to ensure continued sustainable use of Roundup agricultural herbicides and Roundup Ready crops in the future.

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IN THIS ISSUE

Soil Compaction—At Planting and Throughout the Season

Yields and farm profits can be reduced by soil compaction. Sidewall compaction created by planters can have season-long negative effects on root systems, and subsoil compaction can be very difficult to correct. Some information on the causes, effects, and management of sidewall and subsoil compaction can help management decisions to avoid each type of compaction.

Sidewall

Sidewall compaction is caused by planting on soils that are slightly wet. Double disc opener blades compact soil on the sides of the seed furrow and make them slick instead of shattered. Soil surrounding the seed furrow is further compacted from the downward force of the press wheel.

Roots are restricted to growth within the seed furrow, along the direction of the row. This can become more noticeable when soils turn dry and harden. It may be less noticeable if soils stay wet and some roots are able to penetrate the compacted mud of the sidewall.

Sidewall compaction can be avoided by planting when soils are fit. A relatively high clay content near the soil surface can put a field at greater risk for sidewall compaction.[1] Proper moisture for planting can be tested by rolling a handful of soil. If the soil molds into a ball and does not crumble apart easily, a grower should wait for drier soil.

Subsoil

Subsoil compaction is caused by heavy farm machinery and can be more common in conventionally-tilled soils. Other factors affecting soil compaction include rain and organic matter content.

Root growth restriction is a common problem in compacted soils. Compaction can further compromise root growth as poor aeration in the root zone limits oxygen and soil drainage. In some soils, there may be additional nitrogen losses due to runoff and denitrification.

Tillage and subsoiling are temporary ways to relieve compaction. Organic matter and controlled traffic can help resist compaction. Surface organic matter cushions machinery weight. A cover crop has many soil benefits that relieve compaction. Cover crop roots (1) create tunnels for air and water (2) supply food for soil microbes (3) supply exudates that glue soil particles together and improve soil structure.[2]

Photo on right courtesy of Dr. Richard Wolkowski, University of Wisconsin

Figure 1. (Above left) Sidewall compaction can affect root growth throughout the season. Compaction can further compromise root systems as it can cause poor aeration in the root zone which can limit oxygen an soil drainage (above right).

Sources:

[1] *Murdock, L. 2009. Avoiding sidewall compacting during late corn planting. University of Kentucky, College of Agriculture. http://graincrops.blogspot.com (verified 3/7/2012).*

[2] *Hoorman, J.J. et. al. 2011. The biology of soil compaction. Crop & Soils magazine. July-August 2011.*

Best Management Practices for Weed Resistance

Last year, we developed a table to help growers decide on the best weed management strategies for their farm. This year, the updated version is included as developments are made and a more aggressive approaches are taken against tough-to-control and resistant weeds.

Start Clean			Stay Clean	
Corn				
Option	**Pre-plant Burndown or Tillage**	**Pre-plant or Pre-emergence Residual**	**Post-emergent**	**Where Glyphosate-resistant Weeds Exist**
1	Start Clean with tillage or Roundup WeatherMAX®	Primextra® II Magnum®, Converge® XT, Integrity® or Prowl® + atrazine	Roundup WeatherMAX	For giant ragweed, include Marksman or Banvel® II in the weed control program preplant/pre-emergence and/or post-emergence for corn. For Canada fleabane, include Eragon® or Banvel II in the weed control program pre-plant/pre-emergence or Banvel II post-emergence for corn.
2		—	Tank mix Roundup WeatherMAX with one of atrazine, Marksman®, Primextra II Magnum or Prowl + atrazine	

Soybean					
Option	**Pre-plant Burndown or Tillage**	**Pre-plant or Pre-emergence Residual**	**Post-emergent**	**Where Glyphosate-resistant Weeds Exist**	**Where Volunteer Roundup Ready® Corn Exists**
1	Start Clean with tillage, Roundup WeatherMAX or tank mix Roundup WeatherMAX and Eragon®	Pursuit®, Valtera™, Frontier®MAX, Dual II Magnum®, Boundary®, Classic®, or Conquest®	Roundup WeatherMAX	For giant ragweed, include FirstRate™ in the weed control program pre-plant/ pre-emergence or post-emergence for soybeans[1]. For Canada fleabane, include Eragon™ or Amitrol in the weed control program pre-plant, or FirstRate pre-plant, pre-emergence or post-emergence for soybeans.	Apply Roundup WeatherMAX plus Assure® II or Venture® post-emergence
2		—	Use Assignment® or tank mix Roundup WeatherMAX with Classic®		

[1] This program will only be effective where giant ragweed is not resistant to Group 2 herbicides

The Right Planting Date—Based on Calendar or Soil?

With mild winter conditions, the questions now turn to spring planting conditions. Will it be dry and warm as well? Being accustomed to the cool, wet planting conditions of recent years, we review how the calendar and soil conditions affect planting dates for corn and soybean.

Calendar Historically, there are about 100 good hours of planting time at the beginning of May when weather conditions are fair.[1] Factor benefits of early planting with other limitations: 1) how many acres can be planted per day, 2) other farm operations that need attention in the spring, 3) temperature and precipitation forecasts.

Corn. Early corn planting (April 15th to 25th) may be an option depending on soil conditions. After April 26 or May 1, it becomes more important to plant as soil moisture permits regardless of soil temperature.

Soybeans. Planting during the first 10 days of May are recommended for highest soybean yield potential. In 2010, an early planting date (April 15th to May 5th) demonstrated a three bushel yield advantage over normal (May 6th to 20th) planting dates.[2]

Figure 2. Proper soil temperature and moisture are factors to consider when planting in April. Taking temperatures at 11:30 a.m. can give a good estimate of soil temperatures for the planning the day.

Soil Conditions Soil moisture and temperature help determine how early one can plant. Soil should be friable, easily crumbled when rolled in a ball, and not crusted over when dry. Proper soil moisture helps avoid sidewall compaction that can develop at planting and can lead to season-long complications. Soil temperatures can be measured at 11:30 a.m. with a 10-cm (4-in) thermometer.[3]

Temperature of the moisture imbibed by seeds is critical. Seed imbibition is a two-step process; water is absorbed into the seed and the seed swells. Water intake activates enzymatic processes, such as increased respiration and cell duplication. If the imbibed moisture comes from a cold source, such as melting snow or a chilling rain, the cell membranes of corn and soybean seeds can become rigid and rupture. Planting that resumes after cold, wet weather has passed may help avoid the risk of imbibitional chilling injury.

Corn. Soil temperatures of at least 10 degrees C are needed for even germination and emergence.[1] If soil conditions happen to be dry, corn seeding depth should be deep enough to meet soil moisture. Uneven soil moisture can lead to uneven emergence.

Soybean. Soil temperatures should be 10 degrees C at planting and for the next 6 to 24 hours.[3] Soybeans are more sensitive to low temperatures as the growing point emerges from the soil surface. Air temperatures as low as –2.8 degrees C can be tolerated for a short period of time; however, a hard spring frost can kill early-planted soybeans.[3]

Figure 3. A corn seedling that was affected by imbibitional chilling. Planting that resumes after cold, wet weather has passed may help avoid the risk of imbibitional chilling injury.

Summary Early planting of some acreage can help manage the workload and weather risks during spring planting season. Proper soil moisture and a warm forecast should be in place to gain the peace of mind that comes with getting some acreage planted in April. Contact your DEKALB® brand seed representative to discuss spring planting dates.

Sources: [1] Top Crop Manager. Corn planting: how early can one go? www.topcropmanager.com (verified 3/6/2012).
[2] Bohner, H. 2011. Does early planting along with late maturing varieties increase soybean yields? OMAFRA. www.omafra.gov.on.ca (verified 3/7/2012).
[3] OMAFRA. Agronomy Guide for Field Crops. Pub. 811. Soybeans: planting and crop development. Corn planting.

Focus on Uniformity in Emergence With Planter Maintenance

A high return on investment may come when adjustments are made to planters now.

In comparison to population and seed spacing uniformity, emergence uniformity may be more important when it comes to corn seeding. Along with proper soil conditions, planter maintenance should be a priority when it comes to improving uniformity of corn emergence.

Uneven emergence often results from soil moisture differences within the seed planting zone, poor seed-to-soil contact, or uneven planting depths. Emergence delays of about 10 days scattered throughout a field, can result in yield loss up to 9%.[1] Delays of about 21 days, can result in yield losses up to 22%. A difference of two leaves or greater between adjacent plants will generally result in the smaller plant being barren.

Planter maintenance specific to uniform emergence is included below-

1) **Planter should be level,** with the toolbar running slightly uphill and row units parallel with the ground. Bushings may need to be replaced if there is any "play" in the linkage.

2) **There should be good contact between double disk openers.** A sharp 'V' trench is needed for good seed placement. See manual for diameter at which the disk should be replaced.

3) **Closing wheels should be aligned with the double disk opener.** If out of alignment check for wear on the closing wheel supports. Wheels should be checked for turning freely and the down-pressure on the soil should be checked to be sure it is appropriate for the soil type and/or conditions.

Figure 4. There should be good contact between double disk openers. A sharp 'V' trench is needed for even emergence.

General planter maintenance can also be important to maintain planting efficiency and seed spacing uniformity. The following is some general maintenance that can be done this spring-

4) It is important to maintain chain integrity and chain alignment in the drive system and drive clutch.

5) See manual to determine when to calibrate meter. An annual inspection can include evaluating wear on the back plate and brushes, and proper tension on each of the fingers for finger pickup meters. And for vacuum meters consider seal integrity, baffle settings, brush quality, and disc contact with the housing.

6) Seed boot replacement may be necessary if they are worn at the bottom. Wear at the bottom of the boot could cause seed to come in contact with the disk where it would be deflected onto the soil surface.

7) Consider spike wheels for a closing wheel system in cool and moist conditions. A spike wheel paired with a rubber closing wheel is a possibility in some planters to break up sidewall compaction.

8) When properly set, row cleaners should move residue from the row and not soil.

9) Improve depth control and seed-to-soil contact with seed firmers. See manufacturer's recommendation to properly adjust "play" in depth gauge wheels.

10) Planters with finger pickups should be checked for wear and rust on the back plate and brush. A feeler gauge should be used to check tension on the fingers; adjustments should be made if necessary.

11) With air planters, air pressure should be matched to the weight of seed being planted.

Planter maintenance helps optimize plant spacing uniformity and emergence. Refer to the planter operator manual for specific maintenance requirements.

Source: [1] Nielson, R.L. 1997. Stand establishment variability in corn. Purdue Univ. AGRY-91-01.; Precision Planting. 2006. Top ten things to check before planting season. [Online] www.precisionplanting.com (verified 18 January 2010).; Stewart, G. 2006. Corn planting considerations. www.gocorn.net (verified /10/2012).