Walking Your Fields®

Welcome to the fifth issue of *Walking Your Fields*® newsletter for the 2013 growing season. On behalf of your DuPont Pioneer Agronomy team, you will be receiving this newsletter on a monthly basis through October. For more detailed agronomic information please feel free to contact your local Pioneer Hi-Bred sales representative or check out ***www.pioneer.com***.

Managing Corn Grain at Harvest

Corn grain quality is dependent on hybrid selection, growing conditions, harvest practices and drying operations. Except for growing conditions, these factors are generally under the control of the grower.

Good grain quality begins in the field with **hybrid selection and harvest timing**. Pay close attention to crop condition after physiological maturity, as well as grain moisture. Poor quality grain in the field will only deteriorate further as it is handled prior to storage.

Combine Settings: Modern combines maintain grain quality achieved in the field when set properly and checked frequently. However, poorly adjusted combines can negatively affect grain quality, especially if the grain is wet or light, resulting in cracked or broken kernels.

Figure 1: Proper combine settings are important to ensuring good grain quality

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The ground speed should generally be as fast as possible without plugging the head or threshing mechanism.

The cylinder or rotor is designed to thresh corn from the cob. It is no surprise then, that cylinder/rotor speed is the main cause of grain damage. In one study, increasing the cylinder speed from 300 to 600 rpm increased kernel damage from 5% to 30%. However, if threshing is too gentle, unshelled kernels can be lost with the cobs.

Growers should use the lowest possible cylinder/rotor speed that will shell the grain within acceptable loss levels (1% in good-standing fields). To reduce losses without increasing grain damage, try **decreasing the concave clearance before increasing cylinder/rotor speed**. If this does not achieve satisfactory threshing, then begin to increase cylinder/rotor speed as required.

crimps near the base or fails to return to the vertical position, stalk rot is indicated. Check 20 plants in five areas of the field. If more than 10-15% of the stalks are rotted, that field should be considered for early harvest.

Grain Drying: is critical to maintain good quality. High-temperature drying results in stress cracks in the kernel, especially if corn is cooled rapidly after heating in the dryer. With subsequent handling, stress-fractured corn begins to break, resulting in storage problems in the bin and lower value for end uses such as dry milling or wet milling.

Corn grain stored up to 6 months should be dried to 15% moisture. Corn stored from 6 to 12 months should be dried to 14% moisture and corn stored for more than 12 months should be dried to 13% moisture. Storage structures require adequate flooring and air movement to prevent grain from spoiling.

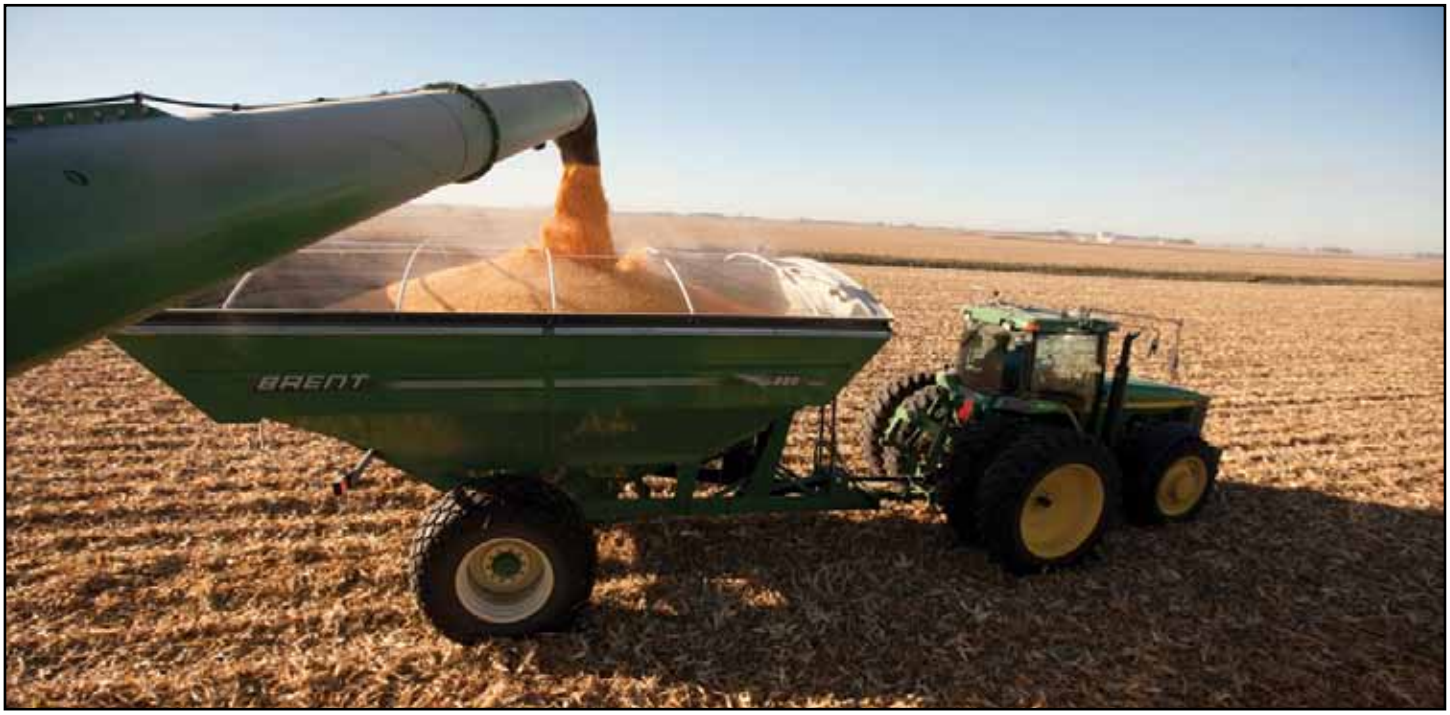


Figure 2. Managing grain moisture in corn is critical to maximizing quality. Image from DuPont Pioneer Agronomy Information System Media library.

Harvest Timing: can affect grain quality in some growing environments. Harvesting wet grain can result in severe kernel damage during threshing and drying. Many agronomists recommend beginning harvest when corn is **approximately 25%** moisture.

Under some situations, including the presence of stalk rot or insect pressure, harvest may need to begin earlier to avoid ear loss from lodging stalks. Weak stalks can be detected by pinching the stalk at the first or second elongated internode above the ground. If the stalk collapses, this indicates advanced stages of stalk rot. Another technique is to push the plant sideways about 8-12 inches at ear level. If the stalk

Excessively wet corn (> 30% Mst) needs to be dried slowly to maintain grain quality. In these situations avoid high drying temperatures to avoid caramelizing (burning the sugar in) the kernels. Wet grain may need to be run through driers more than once.

Grain dryers with manual settings need to be checked frequently with a good moisture tester to achieve the desired moisture levels. Computer-controlled drying systems rely on a moisture tester as a standard to calibrate sensors reading wet grain in and dry grain out.

Considering Post-Harvest Weed Control

In order to make the best use of your time, and money it is important to determine if a post-harvest herbicide application will add value to your production system. To begin, there are several agronomic factors you should consider: what weeds are present in the field, what stage are those weeds at, what you are planning to seed the following year and has there been a frost.

Post-harvest applications can be one of the most effective ways to manage problem weeds such as Canada thistle, dandelions, cleavers, quack grass, foxtail barley and other winter annual or biennial weed species. Winter annuals such as narrow-leaved hawk's-beard, flixweed and tansy have been shown to be effectively controlled with a post-harvest herbicide treatment. Perennial, biennial and winter annual weeds are most successfully controlled in the fall because these plants are moving carbohydrates and nutrient reserves down into the root system at this time. If a systemic herbicide is applied, the herbicide is moved down into the root zone at this time as well, resulting in increased weed control. Post-harvest is an optimum time for control of dandelions, as the crop covering the weed has been removed and the full dose of the herbicide is able to reach the leaves.

When scouting however, one should also evaluate the stage of any annual weed species that may be present. If the annual weeds are small, and will not set seed prior to a killing frost, it is not likely economical at this point in time to consider a herbicide application just for them alone. If the annual weeds are at a stage where they may still produce viable seed, a post-harvest herbicide application may be warranted (See Figure 1). Special consideration should be given to weeds that may be herbicide resistant such as kochia or volunteer herbicide tolerant crops (i.e. volunteer HT canola) that may produce seed. A post-harvest application may help control these weeds prior to additional seeds going into the seed bank, causing additional control concerns in the future. If you are trying to control potential herbicide resistant weeds such as kochia, volunteer canola or cleavers, ensure that you are using a product or a tank-mix partner that will provide control of that herbicide resistant weed.

In order to achieve acceptable levels of weed control, the weeds that you are targeting must be actively growing and have some newer green leaf material. If the target weeds were cut at harvest, ensure that there are at least two or three new leaves present prior to your herbicide application. A rule of thumb is that ideally the weed has 60% green material present prior to the post-harvest weed application. It is also important to ensure that you achieve adequate coverage on the weeds to provide effective control. Be aware that if weeds are covered by chaff or straw left from harvest, they are less likely to receive the herbicide dose they require for effective control.

Weather plays a crucial factor in the decision to apply a post-harvest weed control application. The effectiveness of herbicides that are applied in cooler weather can be reduced due to slow activity in the plant, and a possible decrease in herbicide performance. Fall herbicide applications are best made on a warm sunny day when the weeds are likely to be actively growing and taking in the herbicide. If a frost has occurred, herbicide applications should be delayed at least two or three days, to determine if the weeds are going to continue to grow, or if the frost has been too severe. A severe killing frost may stop the weeds from growing, rendering the herbicide application ineffective.

Once you have made the decision to apply a post-harvest herbicide application, ensure that you have read the label for the product(s) you are planning to use carefully. Specifically note any dates outlined regarding what you can seed in the spring. Several products including Express® SG and Distinct® do have timelines where crops such as canola are not recommended the year following if the herbicide is applied after a particular date. Some products such as glyphosate may also have different rate recommendations for post-harvest applications, so it is important to read the label carefully.

Fall applications followed up with spring or in-crop herbicide applications will provide an ideal strategy for reducing the number of difficult to control weeds.

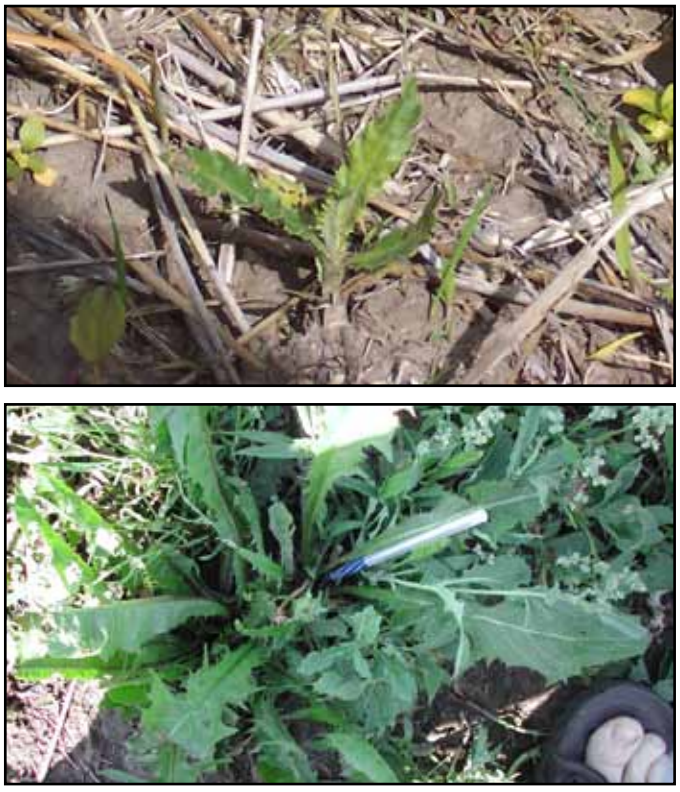


Figure 1. Thistle photo courtesy of Ellis Clayton, Technical Product Manager from Davidson, SK.
Dandelion photo courtesy of Glenda Clezy, DuPont Pioneer Western Canada Agronomy Trials Manager.

Reflecting on decisions made

As harvest winds down, it is a good time to reflect on the decisions that were made this past growing season and their effects your canola production. There are a lot of factors that contribute to the overall yield of your canola crop, and the decisions that are made during the growing season have a significant impact at harvest. For example, maturity, weed control/crop competition, lodging, swathability and harvestability are very important at harvest. All of these parameters are affected by an agronomic spring time decision: **Seeding Rate**.

Seeding rate is one of the most important decisions a grower will make when planting a canola crop. Many growers will seed the industry standard of 5 pounds per acre while others take a more calculated approach that incorporates desired plant stand, thousand seed weight, estimated survivability, and germination to determine their planting rate. No matter how you make your seeding rate decision, the goal is the same – to maximize your return on investment.

Higher seed costs have prompted many growers to consider reducing seeding rates. However, reducing seeding rates can be an issue. A minimum population is still required to realize the canola crop's full genetic yield potential.

"Canola farmers seeking to maximize returns should target populations so that even under adverse conditions they will have more than 50 plants per square metre (5 plants per square foot). Plant populations lower than this will almost always have yield loss." (Shirtliffe, 2009).

Fall is a great time to evaluate your final plant stand and determine how close you were to your target plant population. To do a final plant stand, simply count the number of stems per unit of area (i.e. per quarter meter square). Multiple counts should be done throughout the field to get a true average. Although this number tells you if you hit your target plant stand, it does not guarantee maximum returns. There is still much more to what goes into a canola crop. But remember, it all starts with the seed and having enough plants to meet your yield goal.

Example of final stand count. Photo courtesy of Jim Stadnyk, Pioneer Hi-Bred sales representative.

Managing Clubroot in Canola Effectively

Recently, confirmation of clubroot symptoms, found in two Manitoba canola fields was released by Manitoba Agriculture, Food and Rural Initiatives. This means growers in all the Prairie Provinces need to be vigilant with their scouting program and have a management strategy for this disease. Ample clubroot information is available from the Canola Council of Canada and provincial agriculture departments. Here are a few points to get you started on your management strategy.

Effectively managing any plant disease requires understanding how it survives within fields, and the conditions that allow the population to increase and spread. Clubroot is a soil-borne disease of cruciferous crops and weeds, caused by *Plasmodiophora brassicae*, a protist pathogen that induces gall formation on infected roots of susceptible plants. Infections occur when exudates from roots of host plants trigger germination of resting spores in the soil, producing zoospores. They swim in soil water to root hairs which they infect to start the formation of the root galls. The disease is favoured by warm soil (20-24°C), high soil moisture and low soil pH (<6.5), but can still develop outside these optimum conditions. Clubroot is mainly spread through movement of soil containing the long-lived resting spores that are released into the soil when the galls decay.

What can you do to protect your crop from clubroot?

The primary goal of your management strategy should be to prevent, or at least limit, build-up of the population of clubroot resting spores in fields. Here are some tips that can help:

1) **Early identification.** Scout canola fields regularly from late rosette through podding, being sure to examine the roots of plants. High risk areas for clubroot include field entrances and low lying areas, but it could show up anywhere.

2) **Clean your equipment** to avoid the movement of soil from infested to non-infested fields. If you don't have clubroot on your farm, the greatest risk comes from equipment that was previously involved in tillage or excavation off-farm. If you have found clubroot in some of your fields, then sanitation when leaving those fields is critical to reduce spread throughout the rest of the farm.

PIONEER PROTECTOR CLUBROOT

3) **Grow clubroot-resistant canola varieties.** Pioneer Protector® Clubroot resistance provides multi-race resistance, and a high level of resistance to the most prevalent race (Race 3). This effectively reduces incidence and severity of gall formation in affected fields, protecting yield and reducing the number of resting spores re-introduced into the soil.

4) **Rotate to non-host crops.** Tight canola rotations do not cause clubroot, but can increase the rate of spore build-up once the disease is present in a field. They can also increase selection pressure for breakdown of resistance deployed in infested fields. Good weed management of alternate hosts is essential to maximize reduction in viable spore numbers between canola crops.

5) **Plan your strategy.** Clubroot can be managed effectively but once it is present, it moves with soil regardless of the crop being grown. Manage infested patches separately to limit growth of host plants and equipment traffic, and develop a suitable rotation to maintain the effectiveness of available genetic resistance.

The roots and stalk of clubroot resistant hybrid (left) are healthy and unaffected compared to the clubroot susceptible hybrid which exhibits the characteristic galls (right).

New Ultra Early Soybeans!

DuPont Pioneer is proud to introduce two new ultra early Soybean Pioneer® varieties, P001T34R and P002T04R, to the Western Canadian market place. These two new soybean products are classified as ultra early and we believe they are among the earliest if not the earliest in the market. For example, variety P001T34R has shown to be 5-7 days earlier than other competitor soybean varieties this year in Proving Ground™ trials across Western Canada.

P001T34R

2350 heat units

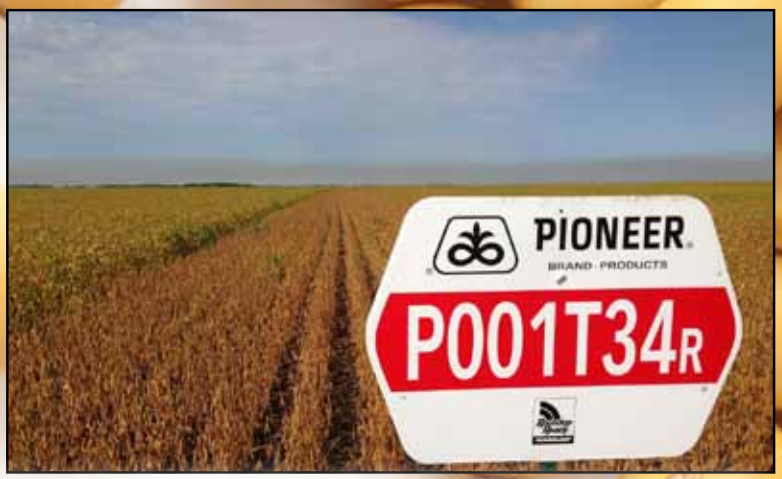
- Ultra Early maturity, earlier than Pioneer® variety 900Y61
- Very good early growth and harvest standability
- Average canopy width
- Very strong iron chlorsis

Picture taken on DuPont Pioneer Soybean Product tour September 4th, 2013 at Carman, MB. New Pioneer® varieties P001T34R and P002T04R.

P002T04R

2350 heat units

- Ultra early maturity, earlier than Pioneer® variety 900Y61
- Excellent early growth scores and harvest standability
- Above average canopy width
- Build-it Phytophthora resistance (Phytophthora gene 1k)
- Good iron chlorsis



Picture taken from DuPont Pioneer Proving Ground™ trial in the Grunthal, MB area September 5, 2013. New Pioneer® variety P001T34R soybean showing its ultra early maturity.

The PROVING GROUND™ 2013 Proving Ground™ Yield Update

What is the Proving Ground™ you might ask? **The Proving Ground™ describes DuPont Pioneer unique, large scale seed** product testing effort across Western Canada. There were more than 1300 large-scale plots planted across Western Canada in 2013. Farming today is large-scale and at DuPont Pioneer, we think seed variety trials should reflect real farming. That's why each year we test our Pioneer® brand seed products in more than 1300 large-scale Proving Ground trials across Western Canada. These canola, corn and soybean trials are grower-managed under real-world growing conditions and farming practices. Proving Ground trials thoroughly test seed traits, seed treatments and agronomic practices. Our goal is to help you evaluate product performance locally, so that together we can position the right Pioneer brand seed product on every acre you grow.

Pioneer® brand Canola Hybrids	Competitor Brand	Competitor Canola Hybrid	# of Field Comparisons	Pioneer® brand Canola Yield (bu/a)	Competitor Canola Yield (bu/a)	Yield Adv (bu/a)	%Wins
45H29	InVigor®	L130	23	44.0	41.1	2.9	70%
45H29	DeKalb®	74-44BL	39	52.2	50.8	1.4	72%
45H29	DeKalb	74-47CR	18	64.0	59.5	4.5	78%
45H31	DeKalb	74-47CR	18	64.4	60.2	4.2	72%
45S54	InVigor	L130	10	51.4	50.7	0.7	50%
45S54	DeKalb	74-47CR	18	63.2	60.2	3.0	72%

Canola yield data summary averaged across 2 years (2012-2013). Yield data collected from large-scale, grower managed Proving Ground™ trials across Western Canada as of September 30th, 2013. Product responses are variable and subject to any number of environmental, disease and pest pressures. Individual results may vary. Multi-year and multi-location data is a better predictor of future performance. Refer to www.pioneer.com/yield or contact a Pioneer Hi-Bred sales representatives for the latest and complete listing of traits and scores for each Pioneer® brand product.

The Proving Ground™. It's where research meets reality.

For yield results visit: www.pioneer.com/yield

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