Pea Harvest Management

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In many areas of Saskatchewan, the growing conditions have been quite dry and hot, making quality the top priority as harvesting approaches. With somewhat shorter crops and the hot, dry growing conditions, yields are expected to be a bit lower than normal, so ensuring crops are harvested at the best quality possible will help optimize crop returns.

Noticeably in some areas the pea crops are suffering from the heat and lack of rainfall. "The conditions are variable across the province with some crops better than others, but overall there is somewhat less precipitation compared to the past few years," says Dale Risula, Provincial Specialist, Special Crops, Crops and Irrigation Branch, Saskatchewan Ministry of Agriculture. "The crops are shorter and yields are expected to be down as well. Therefore, because of the potential impact on yield, farmers are going to want to make sure to have the best quality for what is harvested this year."

Quality Matters

Insects can affect grading of peas as grasshoppers and lady bugs can remain in the sample and cause downgrading due to presence of insect parts, seed staining, and earth tag. Earth tag may occur during combining when moisture from weeds, green pea material, or heavy dew causes soil or dust to stick to the seed. Earth tag is considered when the colour is evaluated and moderate amounts can drop the colour classification to "Fair" which can drop the grade from a No. 1 to a No. 2 or lower.

Bleaching applies to green peas only. The Canadian Grains Commission considers green peas to be bleached if one-eighth or more of the surface of the cotyledon is bleached to a distinct yellow colour, which is marked contrast to its natural colour. To obtain top No.1 grade green peas the sample must have two per cent bleached or lower. At this level only two seeds per 100 seeds can be bleached.

Canadian Grain Commission Grading Guide

Swathing or Direct Combining Peas

Pea plants mature from the bottom to the top, and are near maturity when the bottom 30 per cent of pods are ripe, the middle 40 per cent of pods and vines are yellow-coloured, and the upper 30 per cent of pods are turning yellow. This is the crop stage to swath or desiccate if this is part of your harvest plan.

Peas can be swathed prior to full maturity or straight combined at full maturity. However, to preserve green colour, green peas are usually swathted or desiccated and combined as soon as possible before bleaching occurs.

"With crops on the shorter side this year and potentially lower yields, direct combining with use of a desiccant is probably a good way to go compared to swathing to protect quality," explains Risula. "With swathing, the
longer the pea crop stays out in the swath the more vulnerable it is to degradation factors and the risk of bleaching can increase. If there is any degree of bleaching, then the quality is downgraded. Bleaching occurs when the swathed crop is exposed to combinations of bright sunlight and rain showers. It seems to worsen the effect of bleaching on green peas.”

If straight cutting is planned, desiccation at the right stage of maturity may be necessary. Risula reminds growers that a desiccant does not speed up maturity, so make sure to follow label directions and apply the desiccant at the right time. If you do not, it can affect quality and final crop grades. Under warm dry conditions, a desiccant like diquat works quickly and within four to eight days, the crop may be ready for combining. If using a straight cut header, it should be equipped with vine lifters (pick up guards) and/or a pick up reel to ease the harvest of lodged or tangled crops.

**Figure 1:** *Pea field with even maturity and no weeds is a good candidate for straight cutting and may not need application of desiccant.*

Swathing will hasten drying and prevent shattering but pea swaths are extremely susceptible to damage from wind. Swathers should be equipped with vine lifters (pick up guards) and/or a pick up reel to ease the harvest of lodged or tangled crops. The swather can also be used to cut the crop at full maturity. If cut at full maturity, combine immediately behind to prevent swaths from being damaged or moved by wind. Shattering loss can be high using this method.

**Harvest Aids: Desiccants and Pre-Harvest Perennial Weed Control**

Various chemical harvest management tools are available to aid in the preparation for combining. It is important to select the right product for the right crop and the intended outcome. Is it crop desiccation and dry down, or pre-harvest perennial weed control that is needed? These products are not the same - know what you are planning for and make sure to select the right product, follow label directions, and timing of application. Harvest aid products vary in speed of activity, efficacy, and pre-harvest intervals.

"Growers need to distinguish between pre-harvest weed control and crop dry down," says Clark Brenzil, Provincial Specialist – Weed Control, Crops and Irrigation Branch, Saskatchewan Ministry of Agriculture. "If they are looking for rapid crop dry down, then a desiccant or herbicide with 'harvest aid' use is the product to choose. This would allow growers to apply the product and then harvest a few days later. It also allows them to maneuver around weather conditions if less than ideal for harvest. The whole goal of desiccants or harvest aids is to make sure the crop rolls through the combine efficiently, minimizing plugging."

Pre-harvest perennial weed control products are designed for controlling perennial weeds or heavy green annual weed pressure prior to harvest, they do not speed up maturity or dry down crop seeds faster. "The pre-
harvest timing provides a good opportunity to control perennial weeds because it allows the product to go down into the perennial root and control that plant," explains Brenzil. "Similar applications in the spring do not work as well for some species like Canada thistle, because it results in burning off the top of the plant but the root reserve is still there, so the plant recovers. You have to pick your timing for what you are going after."

**Chemicals for Desiccation and Pre-Harvest Weed Control in Peas**

**Desiccants**

Chemical desiccation can be very effective for green pea, reducing the time to harvest and resulting in a good green coloured seed. Pea crops have an indeterminate growth habit, so often times a desiccant is helpful for terminating the green growth remaining on the plant to speed up harvest timing and efficiency. Timing of the application is critical because it has immediate dry down effects. Application too early will reduce seed size and yield of pea. Apply desiccants when the bottom pods are ripe and dry with seeds detached from the pods. Desiccants do not speed up maturity or improve yield, so make sure to follow label directions for crop staging and timing of application.

Herbicides registered for application prior to harvest of pea crops for desiccation or crop dry down include: diquat (Reglone®, Reglone® Ion, Desica, Diquash), saflufenacil (Heat®), carfentrazone (Aim® and CleanStart®). Always check labels or talk to your dealer to make sure the products are registered for the intended crop and use, for the correct rates, surfactants, water volumes, and timing. Germination of seed is not affected unless applied long in advance of the recommended stage. Powdery mildew and heavy weed infestations can reduce the effectiveness of the chemicals due to coverage reductions.

Following application of a desiccant, pea fields can be ready to combine in as little as four days if hot, dry, sunny weather immediately follows application and up to seven days if weather is less than ideal for drying. Application in the evening and into the night, using high water volumes and the high end of the recommended rate will result in quicker and more consistent dry down. Good coverage is essential for efficacy. There is a risk when using a desiccant, because they are not systemic, that if conditions degrade to cool and wet for an extended period, the crop may begin to regrow from lateral buds and retreatment may be required.

**Pre-harvest Perennial Weed Control**

For pre-harvest perennial weed control various glyphosate products are registered for use on peas. As well, Heat® (saflufenacil) and Aim® (carfentrazone) may be tank mixed with glyphosate when used prior to harvest for a combined contact and systemic activity. Unfortunately the combination of a fast acting contact herbicide with glyphosate can reduce the amount of glyphosate movement out of the leaves of the target plant (weed) reducing its effectiveness on perennial weed control.

The two main reasons for making a pre-harvest application of glyphosate are to control perennial weeds, and to help with harvest by reducing the amount of green weedy material present in a crop; it is not for desiccation. Pre-harvest glyphosate should be applied when the crop has 30 per cent or less grain moisture (75 to 80 per cent of pods are brown). This treatment will provide some crop dry down, but this benefit is inconsistent and is very slow to occur under cool, wet conditions.
"At this stage, you can barely make a dent in the seed with a fingernail," adds Brenzil. "This is the stage when the plant develops a cork type layer between the seed pod and the main plant, preventing sugars or herbicides from moving into the seed. Applying glyphosate too early can reduce yield and seed size, and may result in levels of glyphosate in the seed that exceed maximum allowable levels." Do not apply glyphosate to pea crops destined for seed for planting the following year because of the risk of reduced germination and poor seedling development.

Table 1: Harvest Aids for Desiccation or Pre-Harvest Perennial Weed Control in Pea.

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Active (group)</th>
<th>Company</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aim®</td>
<td>carfentrazone (14)</td>
<td>FMC / NuFarm Agriculture</td>
<td>29 to 47 mL/acre</td>
</tr>
<tr>
<td>CleanStart®</td>
<td>carfentrazone (14) + glyphosate (9)</td>
<td>NuFarm Agriculture</td>
<td>30 mL/acre + 360 grams of acid equivalent per acre (gae/ac)</td>
</tr>
<tr>
<td>Reglone®, Reglone® Ion, Desica, Diquash 1</td>
<td>diquat (22)</td>
<td>Syngenta Canada, Engage Agro, Great Northern Growers</td>
<td>0.5 to 0.7 L/acre</td>
</tr>
<tr>
<td>Glyphosate various products 2, 4, 5</td>
<td>glyphosate (9)</td>
<td>various</td>
<td>360 gae/acre</td>
</tr>
<tr>
<td>Heat®</td>
<td>saflufenacil (14)</td>
<td>BASF</td>
<td>14.4 to 28.4 g/ac</td>
</tr>
</tbody>
</table>

Source: Saskatchewan Ministry of Agriculture

1 for rapid plant tissue dry down to facilitate harvest (desiccant)
2 for pre-harvest perennial weed control and may provide harvest management benefit
3 may be tank mixed with glyphosate when used prior to harvest
4 not for crops grown for seed
5 check individual product labels for registration on each pulse crop

The Saskatchewan Ministry of Agriculture’s publication, 2015 Guide to Crop Protection, lists all harvest aid or desiccant herbicides registered for pulse crops in Western Canada. An update is provided on May 1 of each year to accommodate late entries or changes to these products.

Maximum Residue Limits (MRLs)

Maximum residue limits (MRLs) for crop protection products in harvested crop are established in Canada as well as most importing countries. "However is important for producers to be aware that MRLs are not standardized across all jurisdictions/countries," explains Risula. "Recognizing what MRL levels are in other countries is important to ensure market access into those countries. To avoid problems marketing their crop, growers who are using a desiccant or harvest aid must take appropriate steps to apply these products properly to prevent residues from exceeding MRLs set by regulatory agencies in Canada and importing countries. Always check with your buyer or marketer well ahead of a pre-harvest chemical application, especially with newer
products or products you have not used before, as to where the crop will be going to ensure there will not be any issues."

2015 MRL Information for Growers

When to Start Combining

The best time to combine peas is at around 18 to 20 per cent moisture content to reduce the risk of seed cracking or peeling, and reduce shatter losses. Seed coats are also prone to damage if they are handled at high speeds. Using slower speeds with the combine and auger is recommended in order to reduce cracking of the seed coat.

When combining a swathed pea crop, match the pick-up speed to the ground speed of the combine. Keep the swath moving uniformly to match combine capacity to reduce seed damage and shatter losses. Follow manufacturer recommended settings including low cylinder speeds, ample concave clearance, and maximum wind velocity. Make sure when transferring grain through augers and into bins that it is not subjected to high speeds or lengthy falls.

Figure 2: Pea pods and plants ready for harvest.

Risula reminds growers that in hot conditions just after harvest peas will often respire or go through a sweat if placed in storage. Therefore, it is important that peas are aerated to reduce temperature and any moisture build up that could occur in the bin. For peas, storage at 16 per cent is considered safe, but 15 per cent is better.

Figure 3: Combining peas near Avonlea, Saskatchewan. Source: Saskatchewan Ministry of Agriculture