Lentil Harvest Management

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Lentils were exposed to hot, dry growing conditions this year across much of Saskatchewan and yields are expected to be a bit lower than normal, so maximizing quality is important for optimizing crop returns.

"Although lentil crops have fared the heat and drier conditions fairly well, many crops are definitely shorter than usual, so farmers will have to use everything available to harvest the crop at a lower height," says Dale Risula, Provincial Specialist, Special Crops, Crops and Irrigation Branch, Saskatchewan Ministry of Agriculture. "To maximize yields this year, getting as close to the ground as possible will be important. Growers who rolled their lentil fields after seeding will see a benefit this year."

Quality Matters

"With crops under more stress this year from heat and dry conditions, it is very important to monitor crops closely," says Shane Graefer, Seed Program Manager, AGT Food and Ingredients in Regina. "The season is basically shortened up and plants may dry down faster than normal, potentially causing more factors for downgrading quality. These conditions have also made the window for fungicide application earlier, and the same for insects. Although in a dry year we do not normally expect disease to be a problem in the field, there seems to be very high levels of humidity in many areas. This could be sufficient to cause enough disease to affect quality."

Graefer also reminds growers to keep an eye on colour, which is important in lentils. "There are also wrinkle guides available, so watch lentils for bleaching, immature greens, and possible downgrading due to wrinkling. Watch the crop dry down closely, as this year there will likely be a small window to get the crop dried down and harvested before we start seeing some of the downgrading factors for colour and other quality damage. With shorter crops, the risk of rocks or earth-tag (or soil) on seed can also be a grading factor. The top end grades will always move and always have higher value, and there are homes for those products all of the time."

Swathing or Direct Combining Lentils

Lentils are considered mature when the bottom third of the pods turn yellow to brown and rattle when shaken. This is the stage recommended for swathing, desiccation, or pre-harvest herbicide application. Over the past few years, over 90 per cent of lentils in Saskatchewan have been straight cut.

Lentils can be straight combined when seeds and pods are fully mature, or after desiccation. Harvest timing is a compromise between increased yield from younger pods and shatter losses from mature pods. The oldest, most mature pods almost always contribute more to yield than the younger ones. This means preventing shatter loss is key to maximizing yield.

"Although some might think that under hot dry conditions the lentil crop will mature fairly quickly without a desiccant, usually that is not the case," explains Risula. "Usually there will be a high degree of variability in the
field, even if it is looking like its maturing evenly, so it is better to use a desiccant and try and bring in a more uniform crop to maximize quality and yield. Waiting for lentils to come to an even maturity can increase the risk of the crop becoming too dry and shattering losses."

For swathing lentils, which can hasten dry down and prevent shattering, cut close to the ground to get the bottom pods, with an angle of 20° to 30° suggested for the cutter bar. Swather modifications including pick-up reels and vine lifters are usually needed to do a good job and keep soil from being mixed in with the seeds. To reduce shatter cut under conditions of high humidity. Swaths can be susceptible to wind movement (especially if cut later than the recommended stage). If the swath is subjected to heavy and/or prolonged rain, quality loss can be high due to sprouting, wrinkling, and disease build-up compared to a standing crop.

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 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 plant's 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 Lentils

Desiccants

Chemical desiccation can be very effective for lentils, will reduce the time from maturity to combining, reduce shatter losses, and result in improved quality if the seed is harvested before being exposed to wet weather. Timing of the application is critical because it has immediate dry down effects. Applying a desiccant does not speed up maturity so make sure the crop is mature enough. Application too early will reduce seed size and yield of lentil and increase the risk of wrinkling. Application stage for desiccation is when the lower pods are brown and rattle when shaken.
Standing desiccated crops will also dry more rapidly after a rain, compared to a crop in swath. Germination of seed is not affected unless applied in advance of the recommended stage. Disease and heavy weed infestations can reduce the effectiveness of the chemicals due to coverage reductions.

**Figure 1: Lentils starting to mature with pods turning brown/tan.**

Diquat (Reglone®, Reglone® Ion, Desica, Diquash) has been the most consistent and widely used desiccant through the years. More recently MPower® Good Harvest® has revived glufosinate ammonia for use as a desiccant in lentil, and saflufenacil (Heat®) has been registered but not recommended for use on lentils as maximum residue limits (MRLs) have not been established globally. 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.

Following application of a diquat or carfentrazone, lentil plants 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. The time frame on MPower® Good Harvest® is a bit longer at seven to 10 days. 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 lentils.

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 (lowermost 15 per cent of pods are brown and rattle when shaken). This treatment will provide some crop dry down, but this benefit is inconsistent and is very slow to occur under cool, wet conditions.
Figure 2: Lentil field with sow thistle that is a good candidate for pre-harvest glyphosate.

"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 lentil crops destined for seed for planting the following year because of the risk of reduced germination and poor seedling development.

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.

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

<table>
<thead>
<tr>
<th>Herbicides</th>
<th>Active (group)</th>
<th>Company</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<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, ³, ⁵</td>
<td>glyphosate (9)</td>
<td>various</td>
<td>360 grams of acid equivalent per acre (gae/ac)</td>
</tr>
<tr>
<td>MPower® Good Harvest®</td>
<td>glufosinate ammonium (10)</td>
<td>Farmers of North America/Agracity</td>
<td>1.08 L/acre</td>
</tr>
<tr>
<td>Heat®   ¹,², (red)</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 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
(red) Heat® is registered for red lentil only and MRLs not in place for all markets. Check with buyer prior to application.
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 it 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 lentils is around 18 per cent moisture content. If they are being harvested at the dry stage of 14 per cent, the risk of seed cracking, chipping, and peeling is increased. Combine equipment equipped with flex header, automatic height control, pick-up reel, or air reels and vine lifters are an asset. Careful handling of lentils is important to maintain quality, so using slower speeds with the combine and auger is recommended. Make sure when transferring grain through augers and into bins that it is not subjected to high speeds or lengthy falls.

"Like peas, lentils will also respire or let off a bit of sweat if harvested and placed in storage in dry conditions," says Risula. "Under hot conditions, the harvested lentils should be cooled in an aeration bin first and then stored at 14 per cent for green varieties and 13 per cent for red varieties." The red lentil splitting industry prefers product with moisture content below 13 per cent to improve the efficiency in their splitting plant. Check with your red lentil buyer for any seed moisture content requirements.