



Desiccation of Pulse Crops - Strategies for Success

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When harvesting pulse crops, growers who plan to straight cut may consider including chemical desiccation in their management plan to dry down crops quickly and more evenly, to reduce the time to harvest and preserve quality. The key to success is in planning ahead, following label directions, and ensuring the application is made at the right time to maximize harvest success. In addition to desiccation, growers may consider pre-harvest weed control applications for perennial weed control.

A brief overview of crop desiccants/harvest aids for various pulse crops is provided for:

- Reglone® Ion/Reglone® 240/Diquash/Desica
- CleanStart ®
- MPower® Good Harvest®
- Heat® LQ

Reglone® Ion /Reglone® 240/Diquash/Desica (Diquat Products)

Reglone® Ion and other desiccant products with the active ingredient diquat can provide quick dry down when applied at the right time and with the right application strategies. Reglone® 240 has been used for many years, and recently Syngenta added Reglone® Ion, a new formulation that includes a built in surfactant for ease of use. Robert Klewchuk, Technical Lead - Western Canada with Syngenta Canada Inc. provides some strategies and tips for success with desiccation using diquat products.

Crop Staging

Make sure the crop is at the right stage before applying a desiccant, because the application will not advance seed maturity. A desiccant only dries down the crop to reduce the time to harvest. "Monitor the crop and typically when pulse crops such as lentils, peas, and chickpeas are showing a general color turn and the leaves are starting the dry down process, then the canopy is beginning to open for application. This allows the desiccant to penetrate the canopy more easily," says Klewchuk.

There are generally three tiers or layers of pods on the plants, with most of the yield and the biggest seeds coming from the bottom and middle layers. Timing the application at the right maturity is recommended to maximize yield and minimize potential losses from shattering, weather, or other factors. Klewchuk adds that growers will have to determine whether or not it is worth waiting for the top pods to mature, which in most cases is not likely, because if you wait too long shattering due to strong winds is a risk.

Tips for assessing plant maturity:

- Lowest tier of pods - considered mature when the seeds that are shelled out have turned color and are generally very hard to split when rolled between your fingers.





- Middle tier of pods - generally see some color change and the seeds will split between your fingers with no moisture.
- Top tier of pods - generally the newest pods and can be similar in color to the middle tier, or more green in color and the seeds will pop with moisture when squeezed between your fingers.

Surfactants

Surfactants, which must be included when applying most diquat formulations, are designed to penetrate the waxy cuticle on crop leaves that protect plants from moisture loss and get the product into the plant. Always use the right non-ionic surfactant with the right product. Performance will depend on using surfactants labeled for use with individual products. "Not all surfactants are the same," explains Klewchuk. "When chemists develop formulations, they ensure the surfactant and the chemical products perform well in the field and are compatible in the spray tank."

Rates

	Reglone® Ion		Reglone® 240/Desica	
	Ground litres per acre (L/ac)	Aerial (L/ac)	Ground (L/ac)	Aerial (L/ac)
Peas	0.83	0.83 - 1.12	0.69	0.69 - 0.93
Lentils	0.83	0.83 - 1.12	0.69	0.69 - 0.93
Chickpeas	0.83	0.83	0.69	0.69

Source: Syngenta Canada Inc.

***Note:** To convert Reglone® 240 rate to a Reglone Ion® rate, simply multiply by a factor of 1.2. Reglone® 240, Desica requires the use of a non-ionic surfactant such as Agral® 90 at 1 L spray per 1000 L water solution. Reglone Ion® has surfactant included.

Water volume

Follow label directions by using recommended application rates and water volumes. For Reglone® Ion the recommended water volume is a minimum of 20 gallons per acre, or 200 litres per hectare. Higher water volumes are critical to maximizing performance because they ensure full coverage which includes the bottom of the plant so both stems and leaves will dry down properly for combining. Klewchuk reminds growers that diquat products are strictly contact and will only dry down the plant parts they are in contact with. Diquat will not transport through the plant.

Timing

Weather, day length, sunlight intensity, crop maturity, application rate, and water volume will all affect the speed of desiccation. Generally, crops can be harvested four to seven days after an application of Reglone® Ion.





To maximize the performance of Reglone® Ion, the application is generally best made in the evening, as opposed to in the heat of the day. "The light intensity helps Reglone® Ion desiccate the plant," explains Klewchuk. "It bursts the plant cells and releases the moisture to speed up dry down. To optimize that effect, application in the evening allows time for the droplets to spread across the leaves overnight before being activated by the daylight the next morning. If you apply in the heat of the day, the product droplets will not spread as far as they do in cooler conditions (i.e. on cooler leaves). Early morning is the second best timing, but it is definitely better to avoid the heat and intense light of the day."

Weed Control

Focus your desiccant application on crop dry down and not weed control. Consider a pre-harvest weed control application with products such as glyphosate. Allow four to five days for the glyphosate to translocate to the weed roots and then proceed with the desiccant application.

Final Tip

"A lesson learned over many years of being in the field and working with Reglone® Ion and Reglone® 240 is that the day you believe you are ready to spray, consider waiting a few more days to make sure you are not rushing maturity," says Klewchuk. "Remember, diquat does not speed up seed maturity it just advances the time to harvest. When timing the application, make sure the crop stage is right, use recommended product rates and surfactants, if required, and respect water volumes. Be ready to combine as soon as the dry down is complete to maximize yield and quality."

For more information on Reglone Ion®, Reglone® 240, or Desica please visit: SyngentaFarm.ca or contact the Syngenta Customer Interaction Centre at 1-877-964-3682.

CleanStart®

CleanStart® is a combination of the active ingredients carfentrazone (active ingredient in Aim®) and glyphosate pre-packaged in one case. CleanStart® is registered for use as a harvest aid on field pea, chickpea, dry bean, soybean, but not on lentil.

Crop Staging

"The recommended timing for CleanStart® used as a harvest aid and/or for pre-harvest perennial weed control application is the same as for glyphosate, where the crop must have less than 30 per cent moisture in the seed," explains Graham Collier, Technical Services Manager - Western Canada, Nufarm Agriculture Inc. "Make sure the crop has reached the appropriate stage of maturity as listed on the glyphosate label, as these products will increase the speed of dry down, but they do not speed up the physiological maturity of the crop." As with glyphosate, CleanStart® should not be applied to crops intended for use as seed.





Surfactants

CleanStart® is registered as a standalone product at pre-harvest timing and does not require the addition of a surfactant. "However, in some situations, such as when there is an exceedingly thick canopy that may make coverage of weeds more challenging, then adding a surfactant may be a good idea," says Collier. "For example, consider using a surfactant when trying to increase dry down on heavy weed populations present underneath the crop canopy, which I think may be a common situation this year. The surfactant will help to increase the spread of individual droplets thereby increasing coverage." CleanStart® contains carfentrazone, a contact herbicide, so increasing water volume will increase coverage and increase overall performance.

Registered surfactants include Agral® 90 or Ag-Surf® at 0.25 volume per cent (0.25 litres per 100 litres of spray solution) or Merge® at one volume per cent (one litre per 100 litres of spray solution).

Rates

One case of CleanStart® contains two components, 356 grams per litre (g/L) glyphosate and 240 g/L carfentrazone. The pre-harvest perennial weed control and harvest aid rate is 20 acres per one case of CleanStart®. The harvest aid/desiccant rate is also 20 acres per one case of CleanStart®. This rate provides the glyphosate equivalent of one litre plus two times the carfentrazone pre-seed rate to speed the rate of dry down of crops and green weedy materials.

	CleanStart®	
	Carfentrazone (mL/acre)	Glyphosate, grams of acid equivalent per acre (gae/acre)
Peas, Chickpea, Soybean, Dry Bean	30	360

Source: Nufarm Agriculture Inc.

* use of non-ionic surfactant recommended

Water Volume

Follow label directions and use the recommended water volume to ensure proper coverage. The recommended water volume for CleanStart® is a minimum of 15 to 20 gallons/acre. Higher water volumes will increase product performance.

Timing

CleanStart® will work better and faster under hotter and drier conditions. "The optimum application time is between mid-morning and early evening," says Collier. "In terms of speed of dry down, CleanStart® is in the middle between the speed of products like Reglone® and glyphosate. It will not work as fast as Reglone®, but will be faster than glyphosate." The pre-harvest interval is three days.





Cleanstart® is a good choice where perennial weed control and increased speed of dry down are the main objectives. In situations where weed populations are also a target CleanStart® would provide benefits over glyphosate alone. CleanStart® provides the activity of both a systemic pre-harvest perennial weed control application and a harvest aid in one application.

For more information on CleanStart®, contact Nufarm Agriculture Inc at: <http://www.nufarm.ca>

MPOWER® Good Harvest®

MPOWER® Good Harvest® is a generic glufosinate herbicide registered as a desiccant for lentils, except for lentils grown for seed. Like other contact desiccants, Good Harvest® provides dry down of crops and scorches green leaves of weeds, but will not kill perennial weed root systems.

Crop Staging

The crop must be at the right stage of maturity before applying a desiccant, because the product will dry down the crop rapidly and the application will not advance seed maturity. Follow label directions.

Surfactants

"MPOWER® Good Harvest® does not require any additional surfactant, which is a benefit both economically and efficiency wise when applying the product," says Darren Palendat, Product Manager - Crop Protection, AgraCity Crop and Nutrition Ltd.

Rates

The recommended rate of MPOWER® Good Harvest® for desiccation of all types of lentils is 1.08 litres per acre.

	MPOWER® Good Harvest®
	Glufosinate Ammonium (L/acre)
Lentils	1.08

Source: AgraCity Crop and Nutrition Ltd.

Water Volume

"As glufosinate is primarily a contact herbicide, thorough coverage of the crop canopy during desiccation is essential for the product to be effective," explains Palendat. "Follow label directions and use a minimum of 10 gallons/acre of water. However, use higher water volumes (15 to 20 gallons/acre) if needed to get thorough coverage of the crop canopy."

Timing





With glufosinate, the relative humidity should be at least 50 per cent and temperatures should be between 10°C and 25°C for maximum effectiveness. "Similar to other products such as Reglone®, applying Good Harvest® when relative humidity is higher allows the product to spread over the leaves and soak into the tissue," says Palendat. "Spray early in the morning or in the evening when the humidity is higher and at the recommended water volumes. Low humidity, drought and extreme temperatures will reduce the product's effectiveness."

Good Harvest® is medium acting for dry down, taking a bit longer to work than Reglone®. "MPower® Good Harvest® is slower acting (harvesting begins seven to 14 days after application) than Reglone® (harvesting begins four to 10 days after application), however the end result is the same. Both products provide very effective dry down of the crop."

Weed Control

For pre-harvest weed control, glyphosate is a good option and can be applied prior to the Good Harvest® desiccant application. However, glyphosate is not a desiccant, and although it will kill the plants it may not provide complete drop dry down.

Timing is everything for desiccation, so read the product label and assess your crop before desiccating. Before using any pre-harvest herbicide or desiccant, talk to your buyer to ensure they are okay with the product being used.

For more information on MPower® or Good Harvest®, visit AgriCity Crop and Nutrition at: www.agricity.com

Heat® LQ

Heat® LQ contains the active ingredient saflufenacil and is registered as a harvest aid for use in field pea, dry bean, and soybean. Heat® LQ provides dry down of crops and scorches the above ground biomass including green leaves, flowers, and stems of weeds, but will not kill perennial weed root systems. There are two use patterns for Heat® LQ, one as a standalone product, or can be tank mixed with glyphosate for additional pre-harvest weed control.

"For the 2015 pre-harvest season, Heat® LQ is not recommended for use on lentils because we have not established a global set of Maximum Residue Limits (MRLs)," explains Bryce Geisel, Technical Marketing Specialist Herbicides with BASF. "We are trying to steward the product within industry to make sure growers will not have any export concerns. We do have global MRLs for field peas, dry beans, and soybeans and therefore promote the use for growers to improve the uniformity and harvestability in those fields." Growers are advised to check with their buyer for the export market that will be targeted prior to considering Heat® LQ as a harvest aid.





Crop Staging

The crop must be at the right stage of maturity before applying a pre-harvest aid, because the product will dry down the crop rapidly and the application will not advance seed maturity. Similar to other desiccant products, BASF recommends that when using Heat® LQ for field pea apply when majority of the pods are brown (75 per cent), for soybean apply when 90 per cent of the pods are mature and turned color (yellow to brown), and 80 per cent of leaves have dropped. For dry beans, apply when 90 per cent of the pods are mature and 90 per cent of the leaves have dropped.

Surfactants

Heat® LQ comes prepackaged with Merge® adjuvant in the case and recommended to be added to the spray solution at 400 millilitres per acre (mL/ac).

Rates and Water Volume

"Generally, the recommendation is to tank mix Heat® LQ with glyphosate, unless the crop is being used for seed, because the tank mix provides a better all-around pre-harvest application to include perennial and grassy weeds," says Geisel. "The tank mix provides for a more flexible or versatile application and is suited to a wider variety of weather and crop conditions." Heat® LQ has contact herbicide activity in addition to some systemic movement, which means thorough coverage of the crop canopy during desiccation will provide the best results.

There are two recommended rates for Heat® LQ, one as a standalone and the second as a tank mix with glyphosate.

- The recommended rate of Heat® LQ tank mixed with glyphosate is 43 mL/ac plus the selected glyphosate rate plus the Merge® adjuvant at 400 mL/ac. The recommended water volume for the tank mix is a minimum of 10 gallons per acre (gal/ac).
- The recommended rate of Heat® LQ alone for desiccation of registered crops is 59 mL/ac plus the Merge® adjuvant at 400 mL/ac. The recommended water volume for Heat® LQ alone is a minimum of 20 gal/ac for more complete coverage.

	Heat® LQ	
	Saflufenacil (mL/ac) plus glyphosate (selected rate)	Saflufenacil (mL/ac)
Peas, Soybean, Dry Bean	43 + glyphosate rate	59

Source: BASF

Timing

Heat® LQ is more conducive to dry down under hotter and drier conditions. Heat® LQ works a bit slower than a product like Reglone®, with dry down taking seven to 10 days on average depending on the weather, and





under ideal conditions shorter than that. The pre-harvest interval is three days for peas and soybeans, and two days for dry beans.

Weed Control

"We generally recommend that growers tank mix Heat® LQ with glyphosate for the best results at harvest, as well as control of grassy and perennial weeds. Heat® LQ will provide excellent dry down of broadleaf weeds, including late emerging and winter annuals," adds Geisel. "For crops grown for seed, we recommend using Heat® LQ alone without glyphosate."

For more information on Heat® LQ, visit BASF at: www.agro.basf.ca

Summary Table of Harvest Aids for Use in Pulses

Herbicides	Active (group)	Company	Crops Registered For Use In					
			Chickpea	Dry Bean	Faba Bean	Lentil	Field Pea	Soybean
Cleanstart ^{1,4}	carfentrazone (14) + glyphosate (9)	NuFarm Agriculture	X	X			X	X
Reglone®, Reglone® Ion, Desica, Diquash ¹	diquat (22)	Syngenta Canada, Engage Agro, Great Northern Growers	X	X	X	X	X	X
Glyphosate various products ^{2,4,5}	glyphosate (9)	Various	X	X	X	X	X	X
MPower® Good Harvest®	glufosinate ammonium (10)	Farmers of North America/ Agracity				X		
Heat® LQ ^{1,3} (red)	saflufenacil (14)	BASF		X		Reds only	X	X

Source: 2015 Guide to Crop Protection, 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

(red) registered on red lentil only and MRLs not established for all markets. Check with buyer prior to use.



The [2015 Guide to Crop Protection](#) and Saskatchewan Pulse Growers [MRL Information for Growers](#) 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.

Information pertaining to products described above has been obtained from individual companies, product labels, and the Saskatchewan Ministry of Agriculture's *2015 Guide to Crop Protection*.

