FMC An Agricultural Sciences Company

A Guide To Potato Haulm Desiccation

Optimising Yield and Quality: A Comprehensive Handbook on Potato Haulm Desiccation

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Product Manager

Contents

Desiccation: The Way Forward

- Over the past 30 years the way that farmers have desiccated their potato crops has changed significantly. Following the removal of sulphuric acid many growers turned to diquat as their product of choice for killing off the crop, generally starting their program with a low application rate to open up the potato canopy followed by a higher rate shortly after

- Diquat sprays provided a fast, efficient way of burning down the leaf canopy but it fell short of killing the stems completely, often resulting in regrowth. The introduction of carfentrazone-ethyl, a PPO inhibitor product marketed as Spotlight® Plus, provided a solution as it was found to be very effective at stem desiccation. It also prevented regrowth when used as a follow-up after diquat

- With diquat no longer available one of the most reliable and effective potato desiccants is Spotlight® Plus. Programmed use will ensure potato haulm is desiccated prior to harvest

- Spotlight® Plus has been widely used for over 20 years with no recorded cases of treatment-related tuber vascular effects when used in either wet or very dry conditions

Managing the Potato Canopy

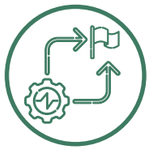
To effectively desiccate a potato crop growers will need to make decisions about how to achieve this even before planting. These decisions will be based on primary factors including variety choice, end market and storage requirements. For example, a crop destined for seed production will need a different desiccation strategy to a determinate second early variety or a late bulking non-determinate main crop variety.

Secondary factors to consider include:

Soil Type

Physiological Age Of The Seed Tuber

Planting Date and Planned Harvest Date



Desiccation Method and Nitrogen Management

Irrigation

These need to be at the forefront of growers' minds to achieve the maximum potential from the crop throughout the growing season and a good result at harvest.

Opinions on the best way to achieve consistent desiccation can vary among potato experts. However, the following factors are widely considered important and should be considered to achieve the best outcome.

- The possibility of physiologically ageing seed before planting i.e. pre-chitting seed
- Reducing overall nitrogen input in line with the RB209 fertiliser guide, particularly on indeterminate varieties, by 30 - 50kg/ha
- Bringing desiccation calendar dates forward to ensure the crop is lifted in optimum weather conditions
- Choosing a flail and spray approach as this has consistently proven to be the quickest and most effective way of desiccating a potato canopy

Desiccation Strategies

1. Haulm pulverising or flailing followed by applications of Spotlight® Plus
2. Foliar only applications after the onset of senescence using Spotlight® Plus
3. Haulm pulling/root cutting
4. Gas burning
5. Electrical haulm desiccation

Features of Spotlight® Plus

- Easy to use product with optimised in-built wetting system - no need for a separate adjuvant
- No buffer zone restriction
- Contact action only so no risk of movement into tubers that could result in residues or internal browning
- Can be applied in wet or dry soil conditions
- Excellent stem desiccant and effective on senescing leaves
- Excellent at preventing regrowth
- Seven-day harvest interval

Spotlight® Plus: Mode of Action

- Protoporphyrinogen oxidase is an enzyme found in the chloroplast that oxidises protoporphyrinogen IX to produce protoporphyrin IX (PPIX). PPIX is important because it is a precursor molecule for both chlorophyll and heme. The inhibition of PPO by inhibitors also results in the formation of highly reactive molecules that attack and destroy lipid and protein membranes. When a lipid membrane is destroyed, cells become leaky and rapidly disintegrate

- Symptoms occur within one to two hours after exposure, appearing first as water-soaked foliage, which is followed by browning (necrosis) of the tissue. Symptoms will appear most quickly with bright, sunny conditions at application and necrotic spots are sometimes surrounded by a reddish coloured ring

Flail & Spray with Spotlight® Plus

- Flailing machines need to be set at the correct height, be in good condition and fitted with deflector plates capable of removing most if not all of the flailed material and transporting it away from the remaining stem into the trough

- Remaining stems should be 15 - 25 cm in length, with as few leaves as possible remaining, to create a good target area for the follow-up spray

- Application of 1.0L/ha Spotlight® Plus should take place 24 - 48 hours after flailing to allow time for any remaining leaves to fall off and stems to dry

- After application, monitor crops closely and if any regrowth occurs a follow-up application of Spotlight® Plus 0.6L/ha should be applied after five to seven days

- Water volume used should be a minimum of 300L/ha. Recommended optimum water volume is 450L/ha

Flailing Summary

Key criteria for effective flailing:

- An upright crop usually flails better
- Set a forward speed appropriate to the crop canopy
- Ensure flail blades are sharp and not worn
- Take time to set up the machine for each field
- Stems should be flailed to around 15cm - 25cm, removing as much leaf as possible
- Deflect chopped haulm away from ridge top

Benefits of flailing:

- Quick removal of haulm limits tuber bulking
- Cost-effective
- Flexible – can be done by a contractor or grower
- Can speed up harvesting by as much as 25%

Spotlight® Plus 1.0L/ha photograph taken 17 days after application following flailing

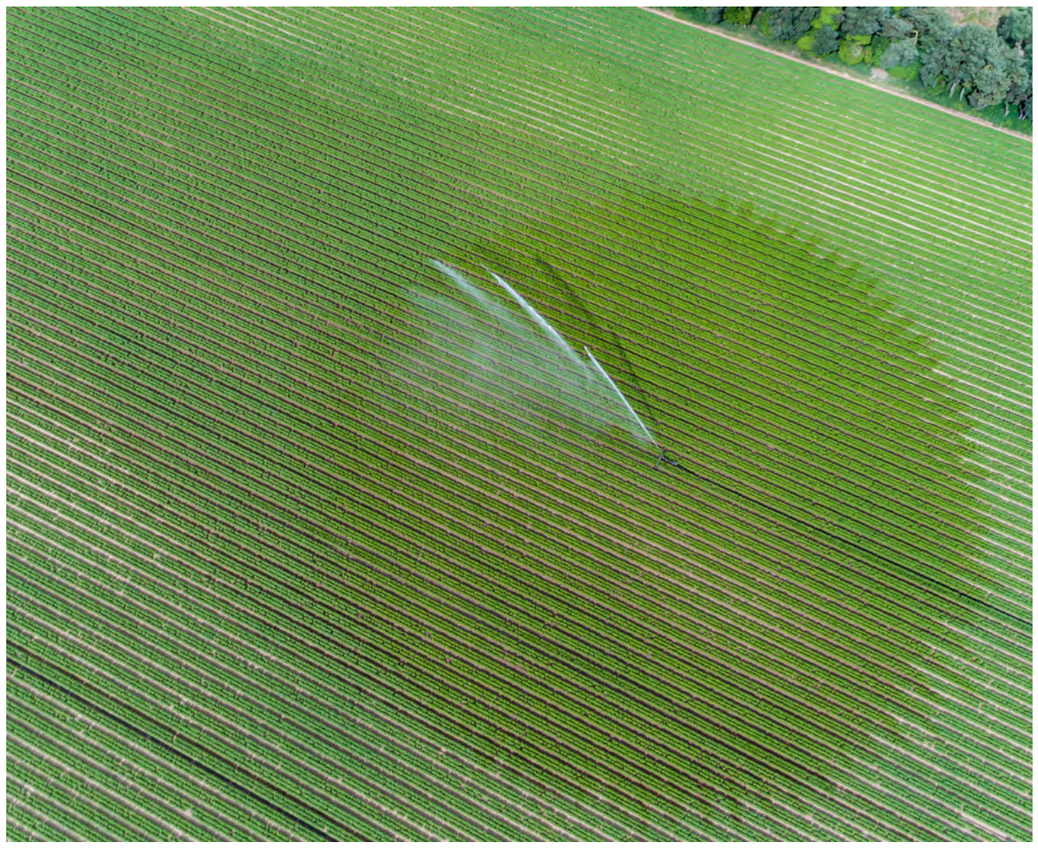
Foliar Applications with Spotlight® Plus

1. Use Spotlight® Plus on any ware or seed potato variety

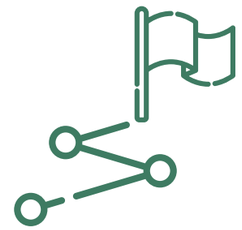
2. Apply Spotlight® Plus to either wet or dry soils with no risk of causing vascular browning

3. For best leaf desiccation results Spotlight® Plus should be applied to a senescing crop

4. Spotlight® Plus can be tank-mixed with an appropriate approved fungicide to reduce the risk of foliar/tuber blight infection



The Ten Point Plan



1. Crop to be treated should have started senescing before application

2. In dense canopied crops, growers may need to apply several applications of desiccant, sequencing Spotlight® Plus with other approved products

3. Applications should be made under bright sunny conditions from mid morning through until mid-afternoon using forward and backwards facing nozzles to ensure maximum canopy penetration

4. Higher water volumes have been shown to improve overall performance of Spotlight® Plus with the optimum around 450L/ha

5. As Spotlight® Plus is a contact acting desiccant, good coverage is critical, consider nozzle choice to improve this

6. The no buffer zone requirement with Spotlight® Plus means the whole field can be treated, reducing disease risk and maximising harvest potential

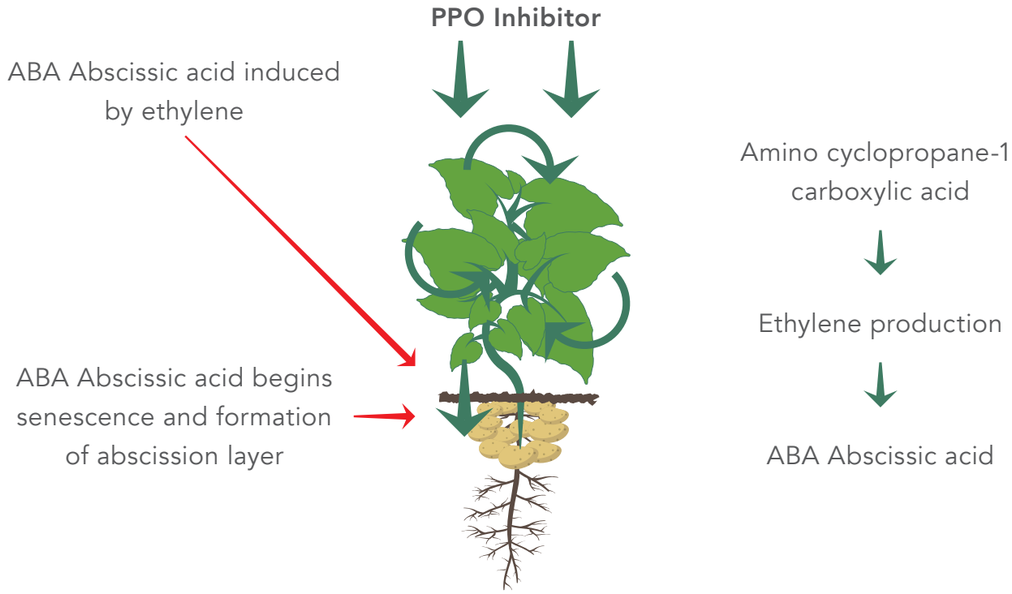
7. Maintain seven-day intervals between applications where possible and include a foliar/tuber blight fungicide at each timing

8. Spotlight® Plus has a short seven-day harvest interval. However, harvest or lifting date should be judged by skin-set development

9. Following the application of Spotlight® Plus to potatoes, any following crop may be planted 28 days later with no requirement to plough first, enabling any un-harvested tubers to remain on or close to the soil surface

10. Effective desiccation with Spotlight® Plus in a dense crop canopy using a planned sequence based on seven-day application intervals will typically take around 21 - 28 days

Foliar Applications with Spotlight® Plus



PPO inhibitors also promote the production of ethylene and abscissic acid. These plant hormones trigger senescence, skin-set and stolon detachment. The photographs on the right show the beginning of abscission following Spotlight® Plus application and eventual stolon detachment. Stolon detachment ensures good skin-set and aids harvesting – reducing damage to harvested tubers and decreasing the numbers of tubers returned to the field.

Abscission/Stolon Detachment

The lower two photos show the stolon becoming constricted (11 days after treatment) and finally detaching completely (22 days after treatment)

Spotlight® Plus

Crop	Potato
Active Ingredient	60 g/L carfentrazone-ethyl
Target	Haulm desiccation
Dose Rate	Maximum individual dose 1.0 L/ha (60g CFZ/ha), any follow-up application should not exceed 0.6 L/ha (36g CFZ /ha)
Maximum Total Dose	1.6L/ha
Water Volume	300 - 600L/ha
Timing	At the onset of senescence, and when the tubers have reached the desired size
Spray Interval	Seven days
Latest Application Timing	Seven days pre-harvest

Endorsements

"I have been using the method of flail and spray to desiccate our often vigorous canopies of indeterminate varieties successfully for a number of years using Spotlight® Plus alone. Our target market is the pre-pack sector aiming for long term storage – and it is crucial to start the cycle with good skin set before harvesting, which we can achieve with Spotlight® Plus. We apply the product in 300L/ha water, usually two days after topping to allow the haulm to wilt back and expose the six inches of stem we have left as a target. I have found it pays to be patient before coming back with a repeat dose if required, to finish the job in challenging circumstances.

- Tom McFarlane, Farm Manager, Bannister Farms

"Spotlight® Plus has become an integral part of the desiccation programme for me. It's rapid action and practical dose rate make it a very good product either on its own or in sequence with other products to achieve successful haulm destruction and skin set.

- Andrew Stilwell, Agronomist/Crop Nutrition Technical

"Spotlight® Plus is good at preventing stem re-growth which, if left uncontrolled, can convey blight infections as well as reduce skin set. With a seven-day harvest interval it offers flexibility in terms of lifting the crop, particularly for salad growers who don't want to be held back at critical times.

- Andy Steven, Agrovista

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