Technical Note TN644

ISSN 0142 7695 • ISBN 1 85482 926 2 • March 2012 • Elec_All

Haulm Destruction in Potato Crops

SUMMARY

- **The timely destruction of the potato haulm is important to stop bulking and optimise the yield of a marketable crop of the right specification whether seed or ware.**
- **Choice of desiccation product or sequence is important to give complete desiccation of leaves and stems top prevent re-growth and the spread of blight or virus.**
- **Potato haulm can be desiccated by chemical or mechanical means or a combination of both. Non chemical methods are available for organic potatoes.**

Introduction

The methods used for commercial destruction of potato crops is dependant on the end market whether it be high grade seed at one extreme to a packing or processed crop at the other. The end market for potatoes specifies many different varieties to be delivered at different times of the year eg small salads no larger than 45mm to large early bakers no bigger than 85mm. This puts pressure on the choice of desiccant or more commonly a programme of desiccation methods to stop the bulking of the crop to deliver to the right specification.

Reasons for good haulm destruction

As well as delivering the appropriate size distribution the appropriate desiccant or programme it may be necessary to consider:-

Prevention of a late virus spread on seed crops. Once seed crops have bulked to the appropriate size and have passed inspection it is important to prevent virus spread by a late aphid migration. Virus control is necessary up to the point of complete haulm death.

- **Reducing late/ tuber blight infection and virus spread.** With new races of late potato blight, with shorter latent periods, it is important to remove foliage as quickly as possible and prevent re-growth. Prolonged desiccation in a high blight pressure season can increase the spread of tuber blight to daughter tubers. The right choice of desiccant or sequence is thus important to prevent any re-growth and give rapid haulm death. It may thus be necessary to prolong the anti-blight programme with a fungicide with good anti-sporulant control until complete haulm death. Generally blighted crops should not be lifted earlier than 14 days after haulm destruction to prevent contamination of the tubers. Similarly it is important to maintain control of aphid and virus control on seed crops until complete haulm death.

- **Improving and speeding skin-set and stolon separation**. The earlier a crop is burned down in relation to its natural maturity the longer it takes for skin set. Crops lifted with skins that have not set are more prone to damage and scuffing. The longer tubers are left in the ground the more they become susceptible to dry rot in warm weather, black dot, black leg and other tuber disease in a wet or prolonged lift; that can all affect skin finish and perhaps marketability. Early burn down should be rapid and crops lifted after a minimum of three weeks. The later a crop is desiccated in relation to its maturity the less time to skin set in relation to harvest.

- **Weed control**. If there has been a problem with weed control, due perhaps to a dry period of weather pre-emergence, the choice of desiccant may also control any weeds that can affect the speed of harvest especially in a wet lift. Blockages and problems on picking tables are not uncommon from poor weed control. This would also be an important consideration in an organic situation where choice of desiccation is limited.

- **Size of crop canopy**. This is usually a factor of crop maturity. Salad crops by definition tend to be immature and in full flower with a large canopy that can be difficult to destroy. Large canopy crops

Funded by the Scottish Government as part of its Crop Health Advisory Activity
SAC is a charity registered in Scotland, No. SC003712

such as Markies or where there has been too much nitrogen applied or perhaps where there is a late flush of nitrogen from a wet period following drought can all present haulm desiccation problems. For processing crops delaying crop destruction can affect dry matters. Growers should consult with the customer on their requirements as regards dry matters and tuber quality.

- **The harvest Interval.** Where nematicides are used for PCN or FLN control then the appropriate harvest interval must be adhered to before desiccation and lifting. Growers should consult the appropriate product label and consider a residue test under the terms of their end market.

Desiccation Options

With the wide range of crop types ranging from high grade seed production to dual purpose seed crops to pre-pack and processing crops it is not surprising that there is a range of desiccation techniques, each suited to a particular crop type.

In crops that are naturally senescing then a single application of a full rate of chemical desiccant may sufficient. These include diquat (Reglone), carfentrazone-ethyl (Spotlight), glufosinate ammonium (Harvest) and pyraflufen-ethyl (Quickdown). See table1 for dose rates and timings.

In crops with a lot of green haulm a split dose or sequence of different active ingredients may be necessary. In general sequences of techniques or products should be used to give an initial rapid control of leaves to stop the bulking process and trigger senescence. The initial burn down of leaves is critically important in seed crops to avoid tubers moving beyond 55mm and in pre-pack ware avoiding tubers going over size. The follow up treatment is necessary to control stems and prevent any re-growth. It is often inadequate control of stems that leads to infection of tubers with bacterial diseases such as Erwinia and fungal diseases such as tuber blight.

The timing of the initial treatment in the sequence to remove leaves and open up the canopy should be targeted when the tubers have got to a marketable size. It should then be followed up a week to 10 days later with a second application to kill the stems and facilitate skin set and crucially good tuber to stolon separation on the harvester.

This can be achieved by:

1. Using a low dose of diquat, (Reglone and other generic products). The maximum dose of Reglone/crop is 5.0lt/ha in 200-500lt/ha of water but for a sequence to kill of the leaf canopy and stop bulking a rate of 1.0- 2.0lt/ha is usually sufficient. Note it is important not to mix the diquat with an adjuvant or a highly wetted product such as carfentrazone-ethyl, (Spotlight Plus) or blight products such as cyazofamid, (Ranman), which require an additional wetter due to the risk of translocation of diquat to the tubers.

   Before application of diquat as a desiccant it is important to do a SMART test on the soil surrounding the tubers. This involves taking a handful of soil from around tubers to create a ball of soil when squeezed. If the ball crumbles it is not advised to use more than 1.0lt/ha of diquat.

   The use of flailing to open up the crop instead of using diquat is an option but should not be used on crops with high levels of Erwinia, (blackleg). If using flailing it is important that the haulm is deposited in the ridge bottoms to expose a stem of 5.0-10cm that can be targeted by the application of a follow up treatment.

To complete desiccation of the remaining haulm/stems the sequence can include:

I. A second dose of diquat with an interval of around 7- 10 days between treatments. Note the total dose/ha of diquat per crop must not be exceeded. (If generics then a total dose /crop is 4.0lt/ha, if Reglone is 5.0lt/ha). Note in a season of high blight pressure then a fungicide with activity on zoospores such as Shirlan should be added to the sequential application.

II. Carfentrazone-ethyl (Spotlight Plus), has good activity on stem desiccation and trials work has shown it is particularly effective on tuber–stolon separation. Spotlight Plus is particularly effective following an initial flailing or diquat application, (figure 1). The application rate of Spotlight Plus is determined by variety and the label should be followed closely. Used in sequence with diquat on indeterminate varieties such as Maris Piper then 1.0lt/ha is usually sufficient but can be followed up with an additional 0.6lt/ha (required if re-growth occurs), see table. The interval between treatments should be no less than 7 days.

III. Flailing following a low dose of diquat, (1.0-2.0lt/ha) has been shown in trials to increase the efficiency of flailing by reducing the bulk of green haulm going through the flailing machine. (figure 2) A side benefit is a useful reduction in fuel costs as less haulm has to be processed! A useful benefit of this technique is that it enables operators during the flailing process to more easily follow the ridges reducing damage to tubers and "greens".

Table 1. Chemical desiccation options

Product	AI/Lt	Max Dose/ Crop/ha	Max individual Dose/Ha	Split Dose Options (suggested)	Harvest Intervall
Reglone, Syngenta	200g/lt diquat	5.0lt	4.0lt	1.0->2.0lt followed by 3.0lt or 1.0lt then flail	None but allow interval for skin set
Harvest, Bayer Crop Science	150glt Glufosinate ammonium	6.0lt	3.0lt (Ware only Not Kerrs Pink)	3.0lt as individual dose following flailing (Ware & seed)	7 days before harvest
Spotlight Plus,Belchim	60g/lt Carfentrazone ethyl	1.6lt	1.0lt	1.0lt following diquat or flailing (additional 0.6lt if required)	7 days before harvest
Quickdown, Certis	26.5 g / l pyraflufen-ethyl	0.8lt	1.6lt	Use following diquat or flailing	14 days before harvest

Physical and Mechanical Haulm destruction (suitable for organic production)

Physical methods of haulm destruction are essential in organic potato production and can play an important part in conventional crops in combination with chemical control methods see table 1. Physical methods should be designed not damage ridges and tubers but must be designed to allow good stolon to tuber separation at harvest. The most common methods of haulm destruction in organic crops are:-

1. Flailing or burning or a combination of both. Organic potato crops do not usually have the same level of green haulm to desiccate as conventional crops so flailing with modern machines is both quick and efficient. The only down side to flailing is the potential spread of disease, should it be present, in a wet year.

2. Haulm burning is by application of a flame or intense heat, It can be done as a stand alone treatment but will not stop a vigorous crop and may require two passes. The technique is more successful following flailing.

3. Haulm pulling is occasional used following flailing but can result in a high degree of crop damage and losses due to greening if there is not good tuber to stolon separation.

Figure 1. Variety Premiere

Figure 2. Variety Premiere

Pictures courtesy of Syngenta

Author:

Mark Ballingall
Weeds and Herbicide Specialist
Applied Practice Team
SAC Consulting
Sandpiper house
Inveralmond Industrial Estate
Perth PH1 3EE