

Grower Summary

FV 307b

Vining and podded peas:
control of potatoes by vision
guided spot spraying

Final 2015

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GROWER SUMMARY

Headline

Timely vision-guided spot applications of glyphosate to volunteer potatoes in vining peas can avoid labour-intensive and costly removal by hand (£60/ha) to ensure a contaminant-free product.

Summary

With the loss of various chemical products over the years the control of volunteer potatoes is of great concern to those who are involved in vining pea production. Excessive levels of potato plant parts or the berries they sometimes produce are not tolerated by processors and can cause loads to be rejected by the factory. Presently available chemical control may cease to be an option in the relatively near future. With limited chemical control and a reliance on labour intensive and expensive hand pulling of potatoes from vining peas, the crop may well become uneconomic for some to continue growing.

Use of the guided weeder to spot apply glyphosate showed some promise. Effective targeting of potatoes was seen in crops grown with a row spacing from 25 to 15cm (in year 1). As row width reduces, the window of opportunity to use the equipment successfully is reduced. Work in the commercial crop (12.5cm row spacing) in year two has highlighted the fact that emergence of the potatoes with, or ahead of the emerging peas is vital for effective targeting of potatoes and subsequent control. Unfortunately season to season this may not happen and potato emergence can continue after canopy closure when detection by the machine becomes impossible.

The spot application of glyphosate remains a welcome option and the study has successfully illustrated the potential of the equipment and generated data to help achieve EAMU approvals for the use of two glyphosate products in vining peas using this technology. The equipment needs to be effective and permitted in as many on-farm crops as possible so that the cost of purchase can be spread making the technique more economic.

Background

Vining peas occupy between 26-30 thousand hectares in the UK and have crop value of £41M. Crop production is a mechanised and carefully planned operation so that the

processing factory receives a continuous supply of vined peas which, for freezing, often takes place within 150 minutes of vining. Each crop load received at the factory is sampled for quality which includes an assessment of extraneous vegetable matter (EVM). Many varieties of potatoes produce berries and these can contaminate the vined peas during harvesting. Potato berries are toxic and their presence in a delivered sample of peas to the factory results in rejection of the whole load.

A survey carried out in 1992, showed that 20.2% of vining peas were affected by volunteer potatoes. This was an increase on data produced in a similar survey in 1974 and although a more recent survey has not been undertaken, there is no evidence of a reduction in potato incidence in vining peas at the present time.

Processors must exercise due diligence to avoid contaminants in produce. Potato berries and all parts of the plant contain toxic glycoalkaloids and are therefore one of the most serious vegetable contaminants. Potato berries are similar in shape size and colour and density to vined peas and they may pass through all the processes in the factory up to final inspection. Removal of low levels of contaminants is sometimes possible with 1 or 2 passes through an electric eye colour sorter and frozen peas can be re-sorted at an additional cost. However this is not possible for peas for canning. Such removal processes add additional processing costs and the loss of good peas is inevitable. If the contamination is too high, the produce is rejected.

Control of volunteer potatoes in the field is difficult to carry out in practice. Herbicides applied after drilling and pre-emergence have the potential to suppress the growth of the volunteers (imazamox + pendimethalin) but the effect can be reduced where the potatoes emerge from depth. Post-emergence broad leaf herbicides are ineffective in either suppressing potato growth or suppressing flower and berry developments. Currently an EAMU is in place for the application of flumioxazin which gives some control of potato foliage and subsequent flowers but application is very dependent on weather conditions after application and the active ingredient is scheduled for withdrawal. There is often little opportunity for cultural control before peas are planted and the final chance of reducing possible contamination is by hand weeding at a cost of £60/ha.

Recent and current work in leeks, onions and carrots demonstrated the potential for a vision-guided sprayer which delivers a small amount of glyphosate precisely to the targeted volunteer potatoes. The ideal time for such an application is when the potato plants can be identified within or between the crop rows. Vining peas are often grown at row widths which

will often be too narrow to provide a sufficiently long window prior to canopy closure at which point detection becomes impractical. However if such a system is effective then a widening of these row widths would not be impracticable for large scale pea growing.

This project was designed to evaluate the potential for the use of the guided weeder in vining peas. It was proposed and agreed, in the final year to extend the trial in commercial crops of vining peas.

Since July 2014 there have been two EAMU's for glyphosate use in vining peas.

Conclusions

At the moment there is an effective selective chemical material which can be used to control volunteer potatoes in vining peas post crop emergence. The approval of the effective materials used in the past was withdrawn some years ago and this is the likely fate of the current option (flumioxazin). Work in onions, carrots and leeks has demonstrated the usefulness of the vision-guided sprayer which delivers a low dose of glyphosate precisely to target. The potential benefits of applying this method to vining peas may help alleviate the difficulties involved in control volunteer potatoes.

With the availability of a glyphosate control option, a reduced acreage of vining peas will have to be hand-weeded to remove potatoes. This may introduce significant cost saving to growing vining peas where potatoes are an issue. Removing potatoes by hand is an option but is expensive (£60/ha), time-consuming and the level of success achieved is dependent to some degree on the individuals 'walking' the field. Having to pay this added cost increasingly regularly will make many growers seriously consider whether producing vining peas is economical.

The ability to use targeted glyphosate applications via the vision-guided spot weeder look as though they would give growers a useful option in some situations and help protect UK vining pea production.

Financial Benefits

Worst case scenario:

In a relatively short space of time, the inability to control volunteer potatoes would cause widespread crop rejection due to increased contamination issues. This could lead to a

collapse of the £41 000 000 UK vining pea industry. The availability of a feasible chemical option could avoid this.

At best scenario:

Vining peas are an expensive crop to grow with seed costing up to £1000/tonne. This combined with pesticide inputs and the costs associated with the logistics of the harvesting operation could mean the increased need and cost of removing potatoes regularly by hand (£60/ha) may well make production unfeasible for many. It is predicted by industry this could reduce the UK acreage by perhaps 30% (7-10000 hectares).

Action Points

With successful applications and approvals for both Roundup Energy (20141672) and Roundup Flex (20141671) via EAMU's, growers are now able to consider the option of a guided spot application.

Growers could see a benefit from growing vining peas on wider spacing. This would leave the crop open for a longer period of time and give a longer 'window' of opportunity for guided spot applications using these products.