



Herbicide evaluations

Investment: £35k over 3 years. Return: £390k p.a.

Challenge

The Potato Council report¹ that considered the impact of the loss of available pesticides as a result of the revision of Directive 91/414/EEC identified that there would be significant changes in weed control, which would result in **additional costs to the industry in the order of £13.5million p.a.** The Water Framework Directive also impinges on weed control options, primarily through loss of post-emergence products and this would have a similar impact on gross returns.

A Potato Council project on herbicide evaluation was commissioned to address these concerns. In particular, the research addressed the control of broad leaved weeds (BLW) with the reduction in approved rates of Linuron from 1.9l to 1.2l ha⁻¹ and the control of grass-weeds across the rotation which has become increasingly difficult due to resistance of commonly used selective herbicides.

Weed competition

The most obvious benefit of effective control is minimising the effect of weed competition on potato yield and quality / grade. Potential yield losses of 30% were suggested if weeds were left uncontrolled in potatoes¹. However, this assessment underestimated the competitiveness and wide distribution of a range of BLW more usually associated with spring planted crops e.g. black bindweed, fat hen, pale persicaria, redshank, small nettle and knotgrass.

The research carried out by John Keer showed how the new rates of Linuron (1.2l ha⁻¹) only provided 40% control of the competitive Polygonum weed species. The benefit of mixing other residual herbicides with Linuron, without compromising yield was shown with a subsequent improvement in BLW control².

These results have been widely reported at both Potato Council and industry meetings and growers have modified herbicide strategies to maintain weed control. **On a conservative estimate that only 10% of the Linuron treated area³ (6 200ha) has used the advice and avoided hand-weeding, a cost to the industry of c£390 000 p.a. has been saved.** This is a saving equivalent to £63/ha and takes account of the

cost of the additional herbicide treatments (from £12-£36) that are required to maintain weed control and avoid a yield penalty.

Weed control across a rotation

Growers make use of broad leaved crops to gain rotational control of grass-weeds and the increasing herbicide resistance in grass-weeds to selective products in cereals, places more importance on their control in crops such as potatoes. The R&D project demonstrated that, although the potential paraquat replacements did not provide the same level of grass-weed control needed to reduce the pressure on selective herbicides in cereal crops, tank mixed combinations of herbicides provided good grass-weed control².

Table 1 shows the cost of selective weed control in a 5 year rotation containing potatoes. Typically, where blackgrass is absent, a rotational cost averaging £390/ha is incurred. Where blackgrass is present this rises to £490/ha. If weed control in one crop is compromised, this has cost implications in the following crops in terms of increased rates of herbicide required or even multiple applications to cope with extra weed pressure. In the case of blackgrass, if good control is not obtained in broad leaved crops, successful control in cereals may not be possible. In extreme situations this can threaten the sustainability of cereal growing.

Table 1 Rotational cost of weed control

Crop	Weed control (£/ha)
Cereal (+/- blackgrass)	120 / 70
Peas/Beans	60
Sugar Beet	110
Cereal (+/- blackgrass)	120 / 70
Potatoes	80
Rotational cost (£/ha)	490 / 390

As well as the direct benefit of the advice on BLW control from the project, the grass-weed control information has been crucial to the continued “rotational control” of grass-weeds now that herbicide resistance is so widespread in the UK. Many of the rotational benefits from good weed control in potatoes are difficult to cost. However, the cost of hand-weeding to correct inadequate herbicide performance in potatoes is £70-100/ha.

Resources and costs

- Impact of reduced pesticide availability on control of PCN and weeds. Potato Council Report. September 2008.

Cost allocated to weed management: £3 000

- Pesticide availability for potatoes following revision of Directive 91/414/EEC: Impact assessments and identification of research priorities. Research Report 2009/2.

Cost allocated to weed management: £5 000

- Weed control in potatoes. Potato Council R&D project (R408) carried out by J Keer, Agrochemex. Research Report 2010/4.

Cost: £27 000 over two years



1 Pesticide availability for potatoes following revision of Directive 91/414/EEC: Impact assessments and identification of research priorities. 2009 S Twining et al. Potato Council Research Report.

2 Herbicide Evaluations project R408. 2010 J Keer. Potato Council Research Report.

3 Pesticide Usage Survey Report 235. Arable Crops in the United Kingdom 2010. FERA.

Mike Storey
Head of R&D

Industry savings delivered from herbicide evaluations

Potato Council
Cost Benefit Analysis - CB04

While the Agriculture and Horticulture Development Board, operating through its Potato Council division, seeks to ensure that the information contained within this document is accurate at the time of printing, no warranty is given in respect thereof and, to the maximum extent permitted by law, the Agriculture and Horticulture Development Board accepts no liability for loss, damage or injury howsoever caused (including that caused by negligence) or suffered directly or indirectly in relation to information and opinions contained in or omitted from this document.

© Agriculture and Horticulture Development Board 2011. All rights reserved.