

WEED CONTROL IN CEREALS

CALU FACTSHEET

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INTRODUCTION

Effective weed control is essential for realising yield potential and minimising diseases in cereal crops. Over the past few decades, conventional mechanisms for weed control have been affected by stricter environmental and public safety legislation including: a reduction in the number of herbicides available for use; tighter regulations for spray applications; and the banning of stubble burning (an effective means of killing some weed seeds). Coupled with a rise in the incidence of herbicide-resistant weeds, weed control has become a greater challenge for many cereal farmers. A holistic approach to weed management encompassing non-chemical or 'cultural' controls, including choice of cultivations and rotation, can help overcome these challenges whilst maintaining a satisfactory level of weed management and avoiding environmental damage. This factsheet provides an overview of different factors for consideration in the control of weeds in cereal crops.

THE IMPACT OF WEEDS

Weeds compete with cereals for water, light, nutrients and space, causing reductions to yield quality and quantity. They can also be host to pests and diseases, and create a bridge for these to be carried over from one crop to the next. When weed seeds are harvested along with the cereal, they cause grain contamination which may result in the crop being rejected at the mill or failing certification. However, weeds do not always have a detrimental effect, in organic and Integrated Crop Management (IPM) cereal systems, weeds are recognised as also having a beneficial role on crop health and growth. Weeds can: act as companion plants, helping to defend against parasitic attacks; improve biodiversity; and, encourage beneficial wildlife. Weeds with long tap roots can bring up minerals from depth, making them available to the main crop and ground cover weeds can help reduce soil erosion and desiccation.

WEED CLASSIFICATION

Weeds are generally classified into two groups, 'grass weeds' and 'broadleaved weeds'. Owing to their similarity to cereals in both biology and life cycle, grass weeds are the most economically significant and hardest to control weeds. Common problem weeds from this group include Blackgrass (*Alopecurus myosuroides*), Wild oats (*Avena fatua*) and, Barren brome (*Amisantha sterilis*). Established populations of these weeds can cause around 25% yield losses. Grass weeds can carry the cereal disease ergot, caused by the fungus *Claviceps pupurea*. Ergot ruins the grains of developing crops and renders them toxic to both livestock and humans. This disease is particularly prevalent in Rye. Of the broadleaved weed group, climbing weeds such as cleavers affect the profitability of a cereal crop by interfering with crop growth and harvest. Impacts include: lodging, late ripening, and blocking the reel of the combine. All resulting in increased harvesting and drying costs

APPROACHES TO WEED CONTROL

Effective weed management duly considers a number of factors, namely: crop choice and rotation; management of the weed seed bank; choice of cultivations; drilling date; crop competition; choice of herbicide (or other treatment), application and timing; recent weed



Cronfa Amaethyddol Ewrop ar gyfer Datblygu
Gwledig: Ewrop yn Buddsoddi
mewn Ardaloedd Gwledig
The European Agricultural Fund for
Rural Development: Europe Investing in
Rural Areas



Centre for Alternative Land Use
Canolfan Ddefnydd Tir Amgen



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

control strategies; weather; and agronomist and farmer perceptions. The following paragraphs provide greater details of these factors.

Correct weed identification, assessment of population densities, and an understanding of the life cycles of individual species, enables the planning and implementation of effective weed control strategies. It also gives an indication of the weed seeds that are likely to be in the soil's seed bank. Seed dormancy lengths and germination depths influence the growth of new weed seedlings from the seed bank. Seed dormancy can change from year to year depending on the weather. For example, if conditions are warm and dry in early summer Blackgrass seeds can germinate as the cereal crop is reaching maturity, but if it is cold and wet at this time, the seeds may remain dormant until the autumn; therefore, timing of treatments for such weeds have to be varied accordingly.

The timing of operations, including herbicide treatments, cultivations, drilling date and the length of rotations, determines their effectiveness as weed control mechanisms. Weeds are generally easier to eradicate when they are small. Therefore, applying herbicides, or other weed treatments, at this time will have the greatest eradication effect. Widening the interval between cereal crops in a rotation increases the opportunities for chemical and cultural controls. For example, the growing of field beans or oilseed rape between cereals enables a wider array of grass herbicides to be used. Alternating between spring and autumn sown crops also increases the window for control.

The timing of drilling influences weed emergence and the window for weed control. Early drilling can ensure that the crop establishes before being out-competed by weeds. The use of stubble cultivations and stale seed bed techniques prior to drilling can encourage the germination of weed seedlings which can then be treated with a broad spectrum herbicide, prior to crop establishment. Ploughing reduces weed growth by burying seeds to a depth where germination is not viable. Although some old seeds are brought back to the surface by the plough, it is still the most robust cultivation method for directly killing off weed seeds.

SUMMARY

Weed management comprises a number of facets as described in this factsheet. The use of cultural methods as a basis for weed control can help reduce the need for herbicide use. Good soil and crop health will also minimise the risk of weed invasions. The degree and nature of weed problems will determine the level of intervention required. Some weeds pose minimal threat to crops, others, such as wild oats can simply be hand rogued, but many grass and perennial weeds require more robust forms of intervention. The use of buffer strips around field margins and alongside hedgerows can encourage beneficial wildlife into the crop, and also protect water courses from herbicide pollution. Individual cereal crops have different natural levels of resilience to weeds. Barley, for example, contains allelopathic chemicals which have a weed suppressant effect. Generally, cereal varieties which are vigorous and leafy are better able to shade out in-field weeds. To ensure effective control, weed management should be addressed during all phases of the rotation, not just during cereal growth.

FURTHER INFORMATION

The Encyclopaedia of Arable Weeds (<http://web.adas.co.uk/WeedManager/frontpage.aspx>)

Website for the cereals and oilseeds division of the Agriculture and Horticulture Development Board <http://www.hgca.com/content.template/0/0/Home/Home/Home.mspg>