Weed Management in Organic Grassland

DEFRA funded project OF0315

This leaflet is not intended for those managing resources of high conservation value e.g. lowland semi-natural grasslands and readers are directed to English Nature who have some excellent publications, which are useful background reading for all see http://www.english-nature.org.uk/pubs/Handbooks/default.asp

The role of grassland:

- Grassland or clover/grass leys are an important part of the organic farming system in the UK. Up to 70% of the farmed area comprises of mixed grasses and legume leys
- On livestock farms grassland forms the basis of the production process, in arable systems the ley is used primarily for maintaining or restoring soil fertility
- The grass may be managed as a short, medium or long-term crop and this may determine the composition of the desirable sward species and the nature of the associated weeds
- The seed mixture for a ley may include a relatively simple mixture of grasses and legumes or may be more complex and contain a range 'herbs' such as yarrow that in other situations would be considered a weed
- Most appropriate composition will also vary with soil type and seed companies can advise on the most suitable mixes
- The composition of the sward will change with time and can be modified to some extent by the management strategy adopted

About the weeds:

- A survey in 1980 of 502 farms in England and Wales where grass was the major crop and at least 50% of that was permanent grass found that 50% of farmers thought thistles (chiefly creeping thistle, *Cirsium arvense*) were a problem , while 40% considered docks, *Rumex* spp., to be a problem
- Thistles were mentioned more by beef farmers while docks were highlighted by dairy farmers. Docks appeared to be associated with low potassium and high phosphate while the opposite was true for thistles
- Thistles were found more frequently on older swards
- Nettles (*Urtica dioica*) were considered a problem by 17% of farmers but these rarely consisted of more than a few isolated patches
- 10% of farmers listed buttercups, which were more of a problem on older swards with impeded drainage
- 9% of farmers listed rushes. Soft rush (*Juncus effusus*) is the commonest species and likely to be a problem on wet land and older swards. In the survey, rush populations were highest on suckler beef farms
- Among the other weeds listed by lower numbers of farmers were a range of broad-leaved and grass weeds including common ragwort (*Senecio jacobaea*), dandelion (*Taraxacum* spp.), chickweed (*Stellaria media*), common couch (*Elytrigia repens*), soft brome (*Bromus hordeaceus*), and annual meadow-grass (*Poa annua*)

A Welsh mountain sheep

HDRA the organic organisation

How can weed problems be reduced?

- Avoid any management practice that creates a very open sward or can damage a sward
  - Long, heavy silage crops
  - Under or overgrazing
  - Poaching in wet conditions/winter
  - Patchy or cloddy manure application
  - Soil compaction by using heavy machinery
  - Ideally gateways and feeding areas should have hard standing/additional support
  - Late hay cuts provide opportunity for weeds to set seed

Newly sown grassland

- Careful preparation of the land and rapid establishment of the sown seeds are the first and most essential requirements for a weed-free young ley or seed crop
- It is important that perennial weeds such as docks and thistle should be destroyed before the seed is sown because these weeds are difficult to control in established grass. The land should be ploughed as deeply as practicable to bury any perennial weeds to the maximum possible depth
- In the spring the land should be worked to a fine, moist seedbed
- If sowing can be delayed until July or August there will be more time to clean the land at a time when weed seed germination is relatively low. However, sowing should not be so late that the clover does not establish before the winter

Established grassland

- The species composition of established grassland is influenced notably by different systems of management
- Reseeding of an established pasture to improve the vigour by increasing the species composition or introducing clover without destroying the existing sward may done by broadcasting the seeds alone or in slurry, after first cutting the grass for silage
- The alternatives include direct drilling the seeds into narrow slots cut into the turf (slot-seeding) or harrowing the sward, broadcasting the seed then rolling it in (sod-seeding). Where necessary, reseeding can be carried out following ploughing or shallow surface cultivation

Grass mixes (information from www.cotswoldseeds.com/organic)

- White clover is probably the most important legume in grass mixtures for medium to long term leys.
- It should be remembered that it has a different growth habit from the grasses and this should be taken into consideration both with choice of cultivar and with sward management
- The proportion of clover in the ley seed mixture will depend on the purpose of the ley
- Red clover is principally used for silage production. These leys can be grazed but high yields make them more useful for conservation
- Red clover has a high crude protein content. Figures around 20% are common. This coupled with high animal intakes, results in higher milk yields and higher liveweight gains compared with grass silage
- White clover is often mixed with perennial ryegrass for grazing and cutting or long term grazing
- White clover can be cut or grazed. It lasts longer than red clover although it is lower yielding. Its lower growth habit makes it suited to grazing and this is its main use. The aim is to produce a sward which contains 30-50% white clover and the right balance of clover to grass throughout the year
- White clover leys are equally suitable for cows or sheep. Where possible an interval of about 35 days should be allowed between defoliation. The gap allows this legume to perform. Most of its nitrogen is fixed during the later stages of growth and therefore early defoliation restricts nitrogen fixation
- White clovers are classified by leaf size. In general terms, the smaller the leaf, the more tolerant of close grazing. The larger, the better for silage or hay

DEFRA funded project OF0315

HDRA the organic organisation

Choice of livestock and grazing regime

- The stocking rate should reflect the carrying capacity of the farm so that well managed grassland can provide sufficient forage
- The grazing regime will depend on the management and condition of the pasture, and on the livestock. The aim should be to maintain a balanced sward, ensure stocking rates are correct and encourage strong regrowth. These factors will also determine the average height of the sward
- Information from 'The breed profiles handbook: a guide to the selection of livestock breeds for grazing wildlife sites' ISBN 1 85716 570 5 available from English Nature can be used to help with breed choice. For example Aberdeen Angus cattle will deal well with coarse grasses, thistles and nettles, and Welsh mountain sheep will take sedges in shorter swards
- Overgrazing will encourage broad-leaved weeds such as bulbous buttercup (*Ranunculus bulbosus*), white cover (*Trifolium repens*), autumn hawkbit (Leontodon autumnalis) and daisy (*Bellis perennis*)
- Undergrazing favours the tall growing grasses red fescue (*Festuca rubra*), cock's-foot (*Dactylis glomerata*) and oatgrass (*Arrhenatherum elatius*) while the low growing rough meadow grass (*Poa trivialis)*, creeping bent (*Agrostis stolonifera*) and perennial ryegrass (*Lolium perenne*) are suppressed

Direct control options

- Good pasture management involves maintaining the condition of the sward
- A new ley can be topped before or after grazing to control annual and perennial weeds. This will allow the young grasses to tiller and thicken
- In established swards chain harrowing in spring levels and aerates the soil surface and will rip out dead grasses
- Regular grazing and cutting will aid weed control
- Creeping thistle will require topping at least twice a season for several years
- Topping docks frequently will prevent seed return
- Taking an earlier silage cut will help prevent seed shed of these two weeds
- Sub-soiling with the mole plough and other sub-surface implements will aerate the soil and improve drainage and potentially weed problems without breaking up or inverting the sward
- The surface can also be aerated with spiking machines or using implements with blades that cut slits into the turf

For further information on weed management go to www.gardenorganic.org.uk/weed-management. There you will find the following:

- Advice on over 130 individual weeds, from Black Grass to Yarrow www.gardenorganic.org.uk/weeds-list
- Advice on cultivation controls, such as crop rotation, tillage and hygiene www.gardenorganic.org.uk/cultural-weed-controls
- Direct control methods, such as mulching and mechanical control www.gardenorganic.org.uk/direct-weed-controls
- Crop weeding strategies, in field vegetables, fruits and grasslands www.gardenorganic.org.uk/crop-weed-management-strategies
- Further reading in research papers.

garden organic
the national charity for organic growing

Formerly HDRA.

This leaflet was produced as part of the 2006 DEFRA funded project 'Participatory Investigation of the Management of Weeds in Organic Production Systems'. Organisations involved included HDRA, The Organic Research Centre, Warwick Horticultural Research International, ADAS, and Rulivsys. The information has been produced from a range of sources, including farmers, advisors and researchers, and we gratefully acknowledge their contributions. It is one of a number of leaflets written to give an overview of non-chemical weed control opportunities and developments in the crops covered. They include historical information and summaries of more recent research.

DEFRA funded project OF0315

More information and notes:

- A useful book is Jon Newton's 'Organic Grassland' (1993) ISBN 0948617284, Chalcombe publications

Please let us know of any experiences you have with weed management in grassland, either by contacting us directly or through our website

The information for this leaflet has been produced from a range of sources, including farmers, advisors and researchers, and we gratefully acknowledge their contributions. These leaflets are intended to give an overview of non-chemical weed control opportunities and developments in the crops covered. They include historical information and summaries of more recent research. Although aspects of crop production that have some bearing on weed control may be covered the outlines are not meant to form a full crop management protocol. The leaflets will be updated as further information from further publications or grower experience is received.
Most of this information, and further details, are available on our website at **http://www.organicweeds.org.uk**

Project information
This leaflet has been produced as part of the DEFRA funded project 'Participatory Investigation of the Management of Weeds in Organic Production Systems'. The project aims to involve farmers and growers in all levels of research and is driven by their requirements. The project is led by IOR-HDRA in collaboration with IOR-EFRC, Warwick-HRI, ADAS and RULIVSYS. To date the project is funded until July 2006. The project website holds all information gathered on weeds and their management, including literature from science, the farming press and practical strategies from organic farmers. It can be found at:

www.organicweeds.org.uk

How can I get involved?
There are many ways to get involved:

- Send us your name and address and we will add you on to the database so you are kept informed about the project
- Offer to provide information about weed management on your farm, see 'Case studies' on the website
- Become a 'focus group' member (the farmer groups who steer the project direction)
- Take part in the farmer trials and surveys (see above or see website)
- Tell us what you want from the project by attending meetings, open days and joining discussions on the website

Contact
Becky Turner or Gareth Davies, HDRA, Coventry, CV8 3LG. Tel: 024 7630 8200 Fax: 024 7663 9229
E-mail: bturner@hdra.org.uk or gdavies@hdra.org.uk

DEFRA funded project OF0315