

## INFO SHEET



# Managing Organic Dairy Pastures to Optimise Production and Minimise Weeds

### Summary

- A combination of perennial ryegrass, white clover, red clover, plantain and chicory gives a high quality, productive sward for organic dairy production.
- Resowing pastures after growing a crop gives the most effective way of improving pastures.
- Oversowing is less effective but has its place for improving swards, especially if done in autumn or for fixing up damaged pasture following pugging.
- Weeds are seldom a major problem on organic dairy pastures if attention is paid to good management techniques combined with strategies such as timely mowing.

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**Aim of Pasture** The key objectives for an organic pasture are:

- Provide high intakes of good quality feed to ensure cows have the body condition and feed supply needed for good milk production and low stress.
- To graze pastures when at about 2600 kg DM/ha down to about 1500 kg/ha, keeping within this range through adjusting total cow intake and the proportion of supplement in the diet. This maintains high cow intake, maximum pasture growth rates and the percentage of white clover.
- Develop pastures with 20-30% legume for effective nitrogen fixation rates and high feed quality.
- Maintain a range of grass, legume and herb species in the pasture so the pasture has biodiversity and stability as well as high feed quality.
- Avoid overgrazing or pugging damage as this kills herb and legume species, and opens the pasture to weed invasion. Overgrazing can be avoided using crops, supplementary feed, good feed budgeting and not having stocking rates too high. Use of feed pads in winter reduces pugging.

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### Pasture Mixtures

Perennial ryegrass, white clover, red clover, chicory and plantain provide a basic biodiverse, or herbal ley pasture. Other species can be added to this mixture depending on local requirements and conditions, *eg* cocksfoot in drier areas. Consider the following points when establishing biodiverse pastures:

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**Pasture Mixtures**

- Sow certified seed and remember to ask the seed merchant for untreated seed.
- Keep perennial ryegrass sowing rate low (e.g. as low as 12kg/ha) to reduce competition against the slower establishing species, which can be increased slightly in their sowing rates to compensate.
- Herbal and legume species are slow to establish and greatly slowed by cold (<10° C) soil. Sow as early as possible in autumn, preferably early Feb/late March, or sow in spring.
- Chicory, plantain and red clover produce and persist best under 28 to 42 day grazing rotations with no grazing in winter especially when the surface soil is soft and wet.
- Perennial ryegrass is the most versatile and productive of the grass species. In dry areas, cocksfoot could be added (and is added by many of the organic dairy farmers surveyed) but can lead to palatability problems. Tall fescue could be tried, but needs to replace perennial ryegrass in the seed mix as it will get out-competed by ryegrass during establishment otherwise.

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**Improving Pasture Composition**

- Generally the best way to improve the composition of pastures (i.e. getting higher producing grasses established, higher clover percentages, more plantain and chicory, and remove low-producing perennial weeds such as browntop) is to completely resow. Recent research has shown resowing pastures usually gives good increases in production, though results can vary depending on technique used.
  - Conventional cultivation followed by 4-6 weeks of fallow, further cultivation of weeds that have grown, and sowing with a roller drill gives both good weed control and pasture establishment.
  - Best control of perennial weeds generally occurs by growing a summer crop such as turnips or maize before planting back into pasture. If perennial weeds are not evident once crop is fed off, just a shallow cultivation is all that is needed to go back into pasture.
  - Over-sowing into an existing pasture (whether by direct-drilling, using a roller drill or just broad-casting then harrowing) seldom works very successfully due to the competition exerted by existing plants against newly establishing seedlings. It will probably work best if done in autumn after a dry spell once moisture is adequate and before temperatures get too low, usually straight after grazing. Some farmers sow seed in conjunction with break-feeding, letting cows tread the seed in.
  - Pugging of pastures should be avoided as it damages soil structure and pasture species; if it does occur, seed is often sown into the damaged areas, usually once it has dried enough to have harrows passed over the damaged area to break up the crusted mud and work the seed in.
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**Other Weed  
Control  
Options**

Weeds are seldom bad enough on organic dairy farms to affect production. Many weed species are eaten by cows, have high mineral contents and good feed value. The following strategies can be used to minimise problems from unwanted weeds:

- Often the main time that weeds are troublesome in pastures is during the first year after resowing, as the bare soil has allowed dormant weed seeds in the soil to germinate. Many of these are annual weeds that will die off naturally within the first year, though good pasture establishment technique and higher sowing rates will reduce this. Also good grazing technique and topping can be used to reduce the impact of these weeds prior to them dying off naturally.
- If densities of Scotch thistle, variegated thistle and nodding thistle are low enough, it might be feasible to chip them to kill them prior to flowering, ensuring the cut is below the crown of the plant which contains dormant buds capable of regrowing. Ragwort plants can be pulled from the ground when flowering, at which time root fragments left behind are less likely to regrow. However, ragwort seeds will continue to mature after the plant is pulled from the soil so flowers need to be removed from the paddock. Chipping of ragwort is usually not recommended as remaining root fragments may regrow, but in the absence of herbicides, careful chipping may be better than leaving the plants to grow.
- When pastures are well established, keeping them competitive over summer will reduce establishment of new thistle problems (e.g. using drought-tolerant species, avoiding over-grazing). Reducing pugging damage over winter (e.g. using feeding pads, grazing stock off the property) will help stop new ragwort establishing.
- Break-feeding over late autumn and winter can help reduce the dominance of some weeds such as docks.
- Californian thistle can be weakened by mowing it whenever it reaches the early flower-bud stage, preventing it from dominating pastures. At this stage, it has used up some root reserves to establish above-ground shoots, and is about to start replenishing these root reserves. If it is consistently prevented from replacing root reserves by mowing at this stage, the weed can be severely affected. Mowing could occur after grazing, or before cows enter a paddock so that they can eat mown material. Note that although many people believe mowing in the rain rots the root system, this relies on suitable fungal organisms to be present, which often isn't the case.
- Mowing can also be used to reduce seed production from species such as ragwort and Scotch thistle if they are mown once stem elongation has begun but before they have formed viable seeds. Generally these species will regrow again, but will produce less seeds than if they were allowed to set seed without any disturbance.
- Mowing can also be used to deal with any scrub-weeds such as blackberry or gorse that are not grazed out as seedlings by the cows. If scrub weeds are a problem in fence-lines, look at raising the bottom wire so cows graze under the fences more readily, thus removing scrub weeds as seedlings.

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**Other Weed Control Options**

- Although most dairy farms are not fenced adequately for sheep grazing, some organic dairy farmers use sheep from nearby organic properties to graze ragwort at certain times of the year in bad paddocks. Sheep are less affected by the alkaloids in ragwort, and some sheep will actively seek out ragwort plants to eat.
- For some weed species such as ragwort, nodding thistle, Californian thistle and gorse, biological control organisms are available which will attack these weeds. They seldom wipe the weeds out from a paddock, but may help make the weeds less aggressive. Agents can often be obtained from local Regional Councils.
- Twin cress is only a problem if eaten by lactating cows, and generally only grows in newly established pastures. Milk taint problems can be avoided if new pastures with twin cress are grazed by any animals on the farm that aren't being milked.

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**Further Reading**

Harrington, K.C., Thatcher, A. and Kemp, P.D. (2006). Mineral composition and nutritive value of some common pasture weeds. *New Zealand Plant Protection* 59: 261-265. [http://www.nzpps.org/journal/59/nzpp\\_592610.pdf](http://www.nzpps.org/journal/59/nzpp_592610.pdf)

Harrington, K.C., Osborne, M.A. and Kemp, P.D. (2008). Weed cover unaffected after converting a dairy farm to organic production. *New Zealand Plant Protection* 61: 116-120. [http://www.nzpps.org/journal/61/nzpp\\_611160.pdf](http://www.nzpps.org/journal/61/nzpp_611160.pdf)

Hayes, L. (2008). The biological control of weeds book: a New Zealand guide. <http://www.landcareresearch.co.nz/research/biocons/weeds/book.asp>

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*The principles summarised in this information sheet come from published literature, the experiences of surveyed organic dairy farmers and work at Massey University.*

Grow Organic Dairy is a project by ODPG and Massey University and aims to grow the organic sector by supporting existing and potential organic farming businesses. The project is funded through Sustainable Farming Fund and DairyNZ.



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