

PROBLEMS ASSOCIATED WITH SELECTIVE CONTROL OF BARLEY GRASS IN RYEGRASS-CLOVER PASTURES IN NEW ZEALAND

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Barley grass (*Hordeum marinum*) is a weed of major importance in improved perennial ryegrass-clover pastures in New Zealand. As with other weed problems the ecology of the particular species must be clearly defined before the most effective and economic method of control can be formulated. Although farmers and research workers have faced the problem for many years, certain vital basic information, particularly related to management of pastures following herbicide treatment, is not known. A successful control programme involves selectively removing barley grass and stimulating the growth and spread of desirable pasture species to prevent further weed seedling establishment.

The herbicides 2,2-DPA (1.5-2.25 lb per acre) (1.5-2.25 kg per hectare) and TCA (6.5- 8 lb per acre (6.5-8 kg per hectare) have been the most widely used for selective barley grass control. The specific conditions under which these herbicides perform satisfactorily are often too critical under farming conditions to perform consistently well. A combination of TCA and 2,2-DPA applied as a mid to late winter treatment shows much promise.

The major and only partly resolved problem is prevention of the establishment of barley grass seedlings. Temporary suppression of ryegrass and clover can occur with the combination treatment, particularly if the pasture is under stress at the time of and following treatment. The rates used for barley grass control also kill or suppress a number of other grass weeds such as *Poa annua*, *Bromus mollis*, and *Vulpia* spp.

In a light infestation (10-20% cover) of barley grass and associated weed grasses in highly productive pastures, the desirable species rapidly recolonize the ground area left by dead weed grasses, producing a tight competitive sward. A herbicide treatment that severely suppresses desirable species only results in a further strike of barley grass seedlings or broadleaf weeds such as thistles or chickweeds, *Cerastium* spp.

As the proportion of barley grass in a pasture increases, long-term control becomes more difficult. Nuclear areas of infestation, such as stock camps and along shelter belts, can often consist of pure associations of barley grass. Two additional herbicide treatments are practised in these areas.

Repeat applications of paraquat (0.25-0.5 lb per acre) (0.25-0.5 kg per hectare) produce a clover-dominant sward which, owing to its open nature, is only partially effective in reducing the re-establishment of barley grass. The other method is the use of sterilants such as simazine which give season-long control resulting in bare ground.

The dominant factor preventing a major overall reduction in barley grass is the lack of desirable pasture species or lack of knowledge of their management to produce tight competitive swards. Cocksfoot (*Dactylis glomerata*) is quite tolerant to the combination rates of 2,2-DPA and TCA but is difficult to establish. The use of yarrow (*Achillea millefolium*), a dense, low-growing species which is tolerant to grass herbicides, is a possibility. To be successful, an introduced species must have the ability to establish rapidly from a spring sowing, be reasonably drought hardy, and withstand close grazing.

To summarize, herbicides are available to adequately control resident barley grass populations, but desirable species and methods to satisfactorily recolonize nucleus infestation areas are yet to be found.

CONTROL OF DICOTYLEDONOUS WEEDS IN SEEDLING LUCERNE

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A large number of dicotyledonous weeds are problems in the establishment of lucerne stands. *Emex australis* is considered particularly troublesome not only because of its competition but also because it can be responsible for sharp fruit in lucerne hay. 2,4-DB is the standard treatment for control of dicotyledonous weeds in seedling lucerne, but a number of the more common species occurring in this crop, such as *E. australis*, *Lamium amplexicaule*, *Stachys arvensis*, and *Capsella bursa-pastoris* are comparatively resistant to this herbicide.

A number of herbicides were compared with 2,4-DB and, of these, prometryne and bromoxynil were selected for further work in a series of trials over three years in the Hunter Valley of New South Wales.