SESSION 6C

GRAMINACEOUS WEEDS.

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1. INTRODUCTION:

The relative importance of graminaceous weeds has grown since the advent of hormonic herbicides to which the grasses generally are not susceptible.

This position may be expected to be emphasised in the future as it has been frequently observed that the continued destruction of one type of plant is usually followed by the appearance of another type which is more resistant to the killing agent. There is also the positive stimulating effect of hormones on grasses.

Fortunately the demand for grass herbicides is being to some extent met by T.C.A. and other compounds but as their action seems to be chiefly on the root, clear cut advice on their use is more difficult to obtain for in addition to the usual complex of weather conditions, stage of growth we have also the problem of different soils and their permeability and retentivity of the herbicide by them.

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11. CLASSIFICATION.

For temperate climates the following grouping is suggested :-

A. Perennials -

1. Twitch grasses

(a) Rhizomatous e.g.
English Couch (Agropyron repens)
Creeping Fog (Holcus mollis)
Kentucky Bluegrass (Poa pratensis).

(b) Stoloniferous e.g.
Creeping Bent (Agrostis stolonifera)

(c) Bulb forming e.g.
Onion twitch, Bulbous oat grass,
(Arrhenatherum elatius var. bulbosum)

2. Tussock grasses

(a) Dry soils e.g.
White tussock grass (Poa australis)
(b) Wet soils e.g.
Tall Fescue (Festuca arundinacea)

B. Annuals -

1. Pasture weeds e.g.
Barley Grass (Hordeum leporinum)

2. Crop weeds e.g.
Wild Oats (Avena fatua)
Winter Grass (Poa annua)

111. GENERAL CONTROL MEASURES.

Twitch Grasses.

Although Twitch Grass may be introduced by seed or by shoots it is difficult to find a farm completely free from any type of twitch. The build up in the population of twitch plants in a paddock is due to a sequence of events, natural and cultural, which favours the growth of the twitch in comparison with the growth of the more useful plants.

Control measures should therefore be concerned firstly with the determining of factors encouraging twitch and causing it to become dominant and secondly with avoiding or reversing those factors.

Twitches possess two methods of reproduction - by seed and by vegetative portions.

Prevention of seeding is not as simple as it may sound for although twitches are not usually very heavy seeders their seeds are frequently ripened late in the season when normal cutting is past and they tend to be neglected. Early hay cutting followed by heavy grazing of the stubble or aftermath is recommended. Crops which ripen late into the summer e.g. spring sown crops, should be avoided if twitch is present as the crop occupies the land at the time when twitch is seeding.

Prevention of spread by killing the vegetative parts is usually an exacting task. It is impossible to lay down a precise schedule of operations as seasons and soils vary so greatly. The objective is a summer fallow during which the twitch is kept as far as possible in large pieces but moved repeatedly to allow thorough drying out and to prevent rooting. The spring ploughing must be deep enough to lift out the whole of the matted portion of the root system. Disc implements are to be avoided, the mouldboard plough, spring tooth and rigid type cultivators being less likely to break up the turfy clods. Where green shoots come away from the

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stems or roots sheep are used to exhaust the food reserves of the plant.

With large infestations, harrowing or raking the dried out twitch into heaps for burning is practised and the use of waste oil to assist the burning may be necessary in moister areas. If as a result of summer rains, and too severe working, detached portions of twitch have become established a decision must be made whether to sow a smother crop such as oats and vetches or to continue with a winter fallow. In cold frosty districts the latter is favoured. In moist districts the use of T.C.A. applied in the Autumn is a possibility. If the winter has been dry enough to allow it, reploughing to reach and to expose new root growith plus a spring sown row crop may be attempted. The application of nitrogen will generally be advisable on account of leaching, especially on permeable soil with a history of heavy cropping. A second summer fallow may be necessary.

1V. SPECIAL CONTROL MEASURES.

Agropyron repens - usually found on wetter areas - drainage indicated.

Holcus mollis - usually found on moist acid soil - liming indicated.

Poa pratensis - usually found on more neutral permeable less fertile and heavily grazed soil - fertiliser indicated also more lenient grazing.

Agrostis stolonifera and Agrostis tenuis - usually found on more acid wet and heavy soils and less fertile and heavily grazed areas - lime and fertiliser indicated. Less resistance to T.C.A. than ryegrasses.

Arrhenatherum elatius var. bulbosum - found mostly in old cultivated areas. The seed most frequently in farm cleaned seed but machine dressing not effective if onion twitch seed has been heavily threshed to remove glumes. If hard grazed for a year or two, onion twitch becomes confined nearer the surface and this enables shallower ploughing and renders turf turning during the fallow much easier. Heavy trampling of stock is more severe on onion twitch than ryegrass. It is then same size as cocksfoot or medium sized ryegrass.

Mature sheep on fallows will eat many bulbs.

A. Tussock Grasses.

The invasion of high fertility pastures in dry districts by tussock grasses is a slow process, and may not be apparent in Tasmania until a pasture has been down ten years or more. It is usually more common in large paddocks where extensive and selective grazing as contrasted with intensive or controlled grazing is practised. Control is usually confined to burning every few years.

In low lying fertile swampy areas tall fescue becomes a problem, especially along drainage lines. The present method of control is to cut or mow.

B. Annuals.

The appearance of annual grasses in a newly sown pasture is an indication of poor seed bed or seed but if annuals appear in a permanent pasture it is an indication of damage to the sward by poaching grass grub, cockchafer etc. or of loss of fertility due to insufficient fertiliser or too frequent cutting for hay. The latter is particularly harmful as it not only withdraws nutrients from the area but also enables early seeding annuals to mature before the hay is cut.

Remedies, apart from eliminating pre-disposing causes include the following: -

1. Topdressing esp.w. K. M o and extra P.
2. Controlling insect pest. DDT.
3. Cutting for silage, instead of hay when annual weeds show up.
4. Spring sowings of pastures
5. Surface sown green feed oats followed by summer fallow then sow down pasture.

V. SOME RECENT REFERENCES.

The number of compounds for the control or eradication of grass weeds continues to increase but there are few references to other methods.

Most of the chemical treatments for grass weeds refer to sports turf and lawns or to the control of roadside grasses - some however refer to selective work on crops.

C.M.U. (20 - 60 lb./ac) appears to give a more lasting effect than T.C.A. (50 - 150 lb./ac) on Agrostis stalonifera in U.K. when used as a pre-emergence spray C.M.U. at .5 lb./ac. controlled annual weeds and did not affect yield of vetch, cocksfoot, lucerne, oats and ryegrass. (1)

20 lb. C.M.U. per acre has given better control in N.Z. than 2 tons of borates and chlorates Paspalum dilatatum requires up to 60 lb. C.M.U. for control. (2)

I.P.C. on lucerne in the Netherlands gave good control of grass weeds, especially Poa annua at 10 Kg 1 P.C. per h.a. applied either in Spring or Autumn. (3)

M.H. applied at 4 - 6 lb. /ac. in 40 gal. water in Spring inhibited growth of Festuca rubra, Agrostis alba and Poa pratensis for 6 - 12 weeks - the grass to be 3" high and at least 2 years old. (4)

P.M.A.S. found effective in controlling Digitaria spp. in Agrostis lawns when applied both at pre and post emergence. (5)

Delapon (Na salt of α - dichloropropionic acid) claimed to be a new systemic grass killer to control annual and perennial grasses under drought and high rainfall. Best effect on well developed grass. Selective action in lucerne flax beet and maize. (6)

T.C.A. found effective in U.K. on grasses Agropyron repens and Poa annua in lucerne 20 lb. per acre of 90% Sodium T.C.A. in 100 gal. water required. (7)

Non-selective control of Agropyron repens obtained in Canada with T.C.A. (40 lb.) + Sodium chlorate (80 lb.) p r acre applied in early Spring. Followed by late Summer treatment with oil. (8)

50 lb./ acre of T.C.A. found effective in U.S.A. on Poa pratensis if applied during hot dry weather. (9)

In New Zealand some 33 trials have shown good control of Barley grass (Hordeum murinum) fog (Holcus lanatus) creeping fog (Holcus mollis) couch (Agropyron repens) Indian couch (Cynodon dactylon) kikuyu (Pennisetum clandestinum) browntop (Agrostis tenuis) onion rooted twitch (Arrhenatherum elatius) var. bulbosum and others. Tall fescue (Festuca arundinacea) and Themeda triandra were resistant.

Rhisomatous grasses were more susceptible than stoloniferous grasses, and established fibrous rooted grasses most resistant.

Best results obtained when T.C.A. was used in conjunction with cultivation. Potatoes, flax and brassicas showed more resistance than legumes. These resistant crops should follow the first ploughing using T.C.A. as a pre-emergence application. This will also keep the crop free of annual grasses. (2)

Mechanical control - in Belgium by knife edged tines. In one year Agrostis spp. and Holcus lanatus were reduced and a marked increase in Lolium spp. (10)

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