WEED CONTROL OVERSEAS

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RESEARCH in Britain is carried out by private firms, by the agricultural research council, and by individuals in the university and agriculture service. Of the private firms Pest Control Ltd., a subsidiary of Fisons Ltd., and Plant Protection Ltd., a subsidiary of Imperial Chemical Industries Ltd., are outstanding, much of the original work stemming from these sources.

The research council unit is located at Oxford University under Professor Blackman and is responsible for evaluating chemicals and formulations under field conditions and for a study of their mode of action in plants under laboratory conditions.

In respect of individuals the work of Professor Wain at Wye College is outstanding in a new approach to selective weedkilling by use of plant enzymes.

The general pattern of weed control in Britain is contract spraying by specialists. Large-scale machinery is in use and some interesting developments have occurred, including the use of the helicopter. The farming pattern has an important bearing on weed spraying. Arable land is heavily cropped and annual weeds are a serious problem. In spite of this crops are generally clean, as spraying is accepted as a necessity.

U.S.A.

As in Britain, manufacturing firms in U.S.A. are active in initiating new chemicals and formulations. The agricultural research and extension headquarters centred at the agricultural colleges in each State carry out evaluation of the materials so provided. Areas visited of special interest were:—

North-east: Use of herbicides in pasture renovation. Large areas of sloping land at present covered with Kentucky bluegrass could be improved in production by the incorporation of legumes and more productive grasses. Fear of erosion has prevented the adoption of conventional methods. Herbicides offer a means of solving the problem.

The herbicide is applied to a close-grazed sward in midsummer, the land is disced twice, and sown with a sod drill in early autumn about 6 weeks later. TCA at 25lb. has proved fairly effective. Dalapon at 6lb. to 8lb. gives good grass control but fails to control broadleaf weeds. ATA at 4lb. to 6lb. gives the best all-round control, but is too expensive. A mixture of 5lb. of Dalapon and 1lb. of ATA is the most promising.

WEED CONTROL IN COTTON (SOUTH-EAST)

With cotton the techniques used in adapting chemical weed control to a very susceptible crop are worthy of study. Cotton is grown under conditions of mild wet winters and wet springs so that little weed control is achieved before sowing. Summer growing annuals such as crab grass (*Digitaria* spp.) emerge concurrently with the cotton seedlings and cause a severe reduction in yield. This problem was formerly met by hand-hoeing, upwards of \$20 per acre being spent. Now that other

operations are mechanised labour is no longer available for this operation and chemical control is skilfully used on a crop as susceptible to hormones as are the brassicas. This consists of:—

1. Pre-emergence spraying
2. Post-emergence directed oil spraying
3. Flame weedkilling

Pre-emergence Spraying

Pre-emergence spraying is done with 5lb. to 12lb. of amine DNBP or CIPC or 1lb. to 2lb. of CMU. To reduce the cost the chemical is applied to a 12in. band over the row. Success depends on careful seed-bed preparation, type of soil, and weather conditions following spraying. An ideal seed-bed is necessary so that the vulnerable cotton seedling is protected by a layer of soil from the weedkiller. This is achieved by rolling the seed row to obtain a fine tilth. Soils rich in organic matter and clay give the best result, as the weedkiller is retained at the surface. Sandy soils are given lighter applications, as the weedkiller tends to move down into the cotton seed zone. The weather after spraying determines the success of the operation. Heavy rain causes leaching of the weedkiller down to the germinating seed with loss of stand. It also dilutes the weedkiller in the surface layer, decreasing weedkilling. In the absence of rain the chemical is not sufficiently activated to give weed control. With DNBP very high temperatures may cause a vapour hazard to the young cotton plants; thus there are fairly critical weather conditions for successful pre-emergence spraying.

Directed Oil Spraying

An oil with a boiling range of 300 degrees to 400 degrees F., about 24 per cent. aromatics, no more than 30 per cent. naphthalenes, and less than 20 per cent. olefins is considered best. A rate of 6 gallons per acre is used as a directed spray towards the base of the plant. Two oil sprayings may be required, the first when the cotton is 3in. high.

Flaming

Flaming is used as the terminal treatment. The cotton plants must be about 8in. tall before they can withstand the treatment. Weeds must be small and up to five flamings may be required.

Net income from hand-hoeing methods and chemical control are about the same. The advantage lies in meeting a changing rural population.

THE CORN BELT (MIDDLE-WEST)

In many areas continuous cropping is carried out, the rotation being corn, corn, soyabeans, wheat. On flat land, with a naturally fertile soil and with adequate fertilisation, high yields are obtained. The weed problem, however, is severe. Annual weeds are controlled by MCP or 2,4-D, but perennial weeds, particularly *Agropyron repens*, cause some difficulty. Dr. K. P. Buckholtz, the editor of "Weeds", has done valuable work on this problem, which may be applicable in New Zealand. Four pounds of Dalapon applied in spring to the twitch before ploughing or 1lb. DCMU after emergence both gave good control in corn.

LEGUME SEED PRODUCTION (WEST COAST)

1. Weed Control

Legumes are grown in pure stands for seed. Yields may be seriously affected by grass competition. CIPC at 4lb. per acre is applied in autumn or spring. After 2,4-D the carbamates are the chief herbicides used in U.S.A.

2. Defoliant for Harvesting

Nearly half the legume crops are treated with a defoliant to permit direct heading. DNBP+DNAP applied in dieselene is the usual treatment.

Grass Seed

Grass seed production is carried out from pure stands with little or no grazing. The control of weed grasses is the principal problem.

1. Annuals: 2lb. of CIPC in autumn with the first rains.
2. Yorkshire fog: 3lb. of DCMU applied in autumn gives selective control.