

The table shows the weed populations after wheat tillering and subsequent wheat yields from six experiments with fumitory (*Fumaria* sp. - pink-flowered), wild turnip (*Brassica tournefortii*), white ironweed (*Lithospermum arvense*), amsinckia (*Amsinckia* spp.), and deadnettle (*Lamium amplexicaule*). Only those materials which reduced weed numbers are shown, and only those results from a most commonly recommended rate of 4 oz a.i. per acre (0.28 kg a.i. per hectare). It is planned with the aim of assessing the economics of control of these and other broad-leaved weed species.

The results in 1969 show that, despite large reductions in weed populations, few significant yield increases occurred. The notable exception was with amsinckia, where a yield improvement of about 9 bushels per acre (600 kg per hectare) was obtained. These and other experiments indicate different competitive abilities of various weeds and, until sufficient constant rate experiments have been done with each species, the probability of the economic worth of control will not be able to be assessed.

#### CHEMICAL CONTROL OF CAPEWEED IN WHEAT AND OATS

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Capeweed (*Arctotheca calendula*) can occasionally be a widespread weed in cereal crops in north-east Victoria. It most commonly occurs when the autumn 'break' rainfall is below normal, resulting in soil conditions being too dry for effective pre-sowing cultivation. In years of average autumn rainfall, the weed is confined mainly to crops sown on the lighter soil types of the district.

From 1965 to 1969 a range of herbicides was evaluated for control of capeweed in wheat and oats. These were bromoxynil, bromoxynil + MCPA, prometryne, diquat, linuron, and picloram applied at the crop three to four leaf stage, and 2,4-D amine, 2,4-D ester, and picloram applied at the crop post-tillering stage. All experiments were of randomized block design with from four to six replicates. Capeweed density counts were made in spring and grain yields were obtained.

All herbicides applied at the crop three to four leaf stage, when the capeweed rosettes were generally less than 4 in. (10 cm) in diameter, produced marked reductions in weed density.

However, applications of 2,4-D at the crop post-tillering stage had a slight effect only on capeweed populations. At this later stage, the capeweed rosettes were often up to 12 in. (30 cm) in diameter, and the 2,4-D application caused only a temporary check in growth. Picloram applied at this later stage effectively controlled capeweed but, at the rates tested, caused some stunting of the crop. The early application of picloram and bromoxynil + MCPA also caused some stunting of growth and led to head distortion, particularly in wheat.

In the four wheat experiments conducted, significant grain yield increases were obtained with bromoxynil applied at 4 oz a.i. per acre (0.28 kg a.i. per hectare) and diquat applied at 2 oz a.i. per acre (0.14 kg per hectare) of the diquat ion. Both these materials showed good crop safety, and at the above rates gave additional returns of \$6.54 and \$5.98 per hectare, respectively. The ester of 2,4-D applied at 5 or 6 oz a.i. per acre (0.35 or 0.70 kg a.i. per hectare) after tillering gave similar additional returns of approximately \$2.60 per hectare for each rate, but the higher rate gave more consistent responses.

With oats, however, despite the generally higher weed populations, a significant yield increase to herbicide application was obtained in only one experiment, where the capeweed population was 21.4 plants per sq ft (2.3 plants per dm). It appears that the general early vigour of oats may be sufficient to outgrow all but the heavy populations of capeweed, and consequently spraying may not be warranted.

#### THE CONTROL OF SOURSOB (*OXALIS PES-CAPRAE*) BY THE USE OF HERBICIDES IN SOUTH AUSTRALIA

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*Oxalis pes-caprae* is the most serious weed of cereal-growing areas in South Australia. An estimated 1½ million acres (610,000 hectares) are infested but long-term familiarity has reduced farmer concern. Crop yield reductions of from 20 to 50% by soursob competition are indicated by preliminary experiments. Sheep grazed on soursob-dominant pastures may suffer severe kidney damage.

Michael (1965b) suggested control measures based on a 'critical