WEED CONTROL IN CABBAGES WITH AZIPROTRYNE, CLETHODIM AND THEIR COMBINATION

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Cabbages (*Brassica oleracea* L. var *Capitata*) are usually grown in wide spacing which provides ideal conditions for weed growth. Early weed competition reduces both yield and marketability of the crop (Abernethy and Mitchell 1992). A single herbicide might not give adequate control of the weed species present in a farming situation. Therefore, herbicide combinations need to be tested for optimum performance in different localities. This experiment compares the efficacy of a broadleaf herbicide (aziprotryne) and a grass weed killer (clethodim), applied alone or in sequence for selective weed control in cabbages.

Cabbage seedlings were transplanted on 15 December 1993 into a Wakanui silt loam soil at Lincoln University Research Farm. Plant spacing was 0.5 x 0.5 m and plot size was 2 x 2 m. Application of herbicide treatments was carried out on 10 and 14 January 1994 with a knapsack sprayer delivering 300 litres water/ha. Herbicide treatments were aziprotryne (Brasoran 50 WP) at 2 kg/ha alone and in mixture with clethodim (Centurion 240 EC) and mineral oil (0.12 kg/ha and 2 litres/ha, respectively), sequential application (4 days apart) of aziprotryne and clethodim at the same rates as in the mixture, and clethodim at 0.12 kg/ha alone or with mineral oil. The experiment included an untreated control and had a randomized complete block design with four replicates. On 1 March 1994, the fresh weight of nine cabbages (head and outer leaves) harvested from the middle of each plot and dry weight of the most abundant weeds were recorded and analysed.

Broadleaf species comprised the main weeds in the experimental area with wireweed (*Polygonum aviculare*), hedge mustard (*Sisymbrium officinale*), and fathen (*Chenopodium album*), being the most abundant species (Table 1). Application of aziprotryne alone or in sequential application with clethodim significantly reduced dry matter of wireweed and hedge mustard (Table 1). Combination of aziprotryne and clethodim did not give adequate control of the above weed species which indicates the possibility of antagonism between these two herbicides. Fathen and sowthistle (*Sonchus oleraceus*) were controlled almost completely by aziprotryne alone, in mixture and in sequence with clethodim.

Phalaris (*Phalaris minor*) was the main grass species present and was controlled by clethodim sprayed alone, in mixture or in sequential application with aziprotryne (Table 2). Addition of mineral oil was not necessary for effective control of phalaris by clethodim.

The highest crop yield was obtained with a sequential application of aziprotryne and clethodim or with aziprotryne alone which resulted in more than a two fold increase in the fresh weight of cabbages compared to the untreated control (Table 2). Similarly, Abernethy and Mitchell (1992) reported effective control of broadleaf weeds in cabbages with aziprotryne. Application of aziprotryne plus clethodim and oil resulted in some burning effect on the older leaves. However, the symptoms were temporary and were not present at harvest. The lower yield of cabbages obtained in this treatment seems to be a result of more competition from broadleaf weeds.

TABLE 1: Dry weight of broadleaf weeds (g/m²) 10 weeks after application of herbicides to cabbage plots.

Treatment	Wireweed	Hedge mustard	Fathen	Sowthistle	Others
Untreated control	77.9	56.3	30.5	14.2	98.4
Aziprotryne	26.6	28.4	0.0	5.3	43.5
Azi.+Cleth+oil	36.6	54.0	0.0	0.0	61.3
Azi.→ ⁽¹⁾ Cleth+oil	16.5	10.1	0.0	0.0	30.2
Clethodim	65.1	59.0	36.0	9.0	67.1
Cleth. + Oil	66.7	50.7	51.3	8.3	107.9
LSD .05	35.5	25.0	19.7	11.2	41.3

⁽¹⁾ Indicates sequential application 4 days apart.

⁽²⁾ Other broadleaf weeds were black nightshade (*Solanum nigrum*), scarlet pimpernel (*Anagalis arvensis*), scentless chamomile (*Matricaria inodora*), Shepherd's purse (*Capsella bursa-pastoris*), field speedwell (*Veronica arvensis*) and spurrey (*spergula arvensis*).

TABLE 2: Dry weight of phalaris and total broad leaf weeds (g/m²) and fresh weight of cabbage (kg/m²).

Treatment	Phalaris	Total broadleaves	Cabbage yield
Untreated control	16.32	277.3	1.72
Aziprotryne	28.27	103.7	3.57
Azi.+Cleth+oil	0.17	151.9	2.69
Azi.→ ⁽¹⁾ Cleth+oil	2.70	56.8	3.65
Clethodim	0.20	236.2	1.98
Cleth. + Oil	0.0	285.0	1.58
LSD .05	6.00	83.3	0.92

⁽¹⁾ Indicates sequential application 4 days apart.

In conclusion, selective control of broadleaf weeds in cabbage was obtained with post-emergence application of aziprotryne. Grass weeds were controlled by clethodim but this should be applied separately from aziprotryne as control of some broadleaf weeds was reduced when the herbicides were applied together.

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REFERENCES

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