

Effects of treatment timing

Solvejg K. Mathiassen, Per Kudsk

Department of Agroecology, Aarhus University, Forsøgsvej 1, DK-4200 Slagelse, sma@agro.au.dk

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Information on herbicide efficacy and the influence of application timing is important in order to optimise control of common ragweed.

Materials and methods

Seeds of common ragweed were sown in 2 L pots in a potting mixture consisting of field soil, sand and peat (2:1:1 w/w). The pots were placed in a heated glasshouse and watered as required. After seedling emergence the number of plants per pot was reduced to 4. Herbicide treatments were carried out at four different growth stages: 4-leaf stage, 7-leaf stage, early flowering and late flowering. Five herbicides were included in the study: glyphosate, florasulam, clopyralid, mecoprop-P and mesotrione. The herbicides were applied at 4 doses (1/8N, 1/4N, 1/2N and 1 N) using a laboratory pot sprayer equipped with a boom fitted with two Hardi ISO F110-02 flat fan nozzles delivering a volume rate of ca. 150 l/ha. Each treatment was replicated three times.

Foliage fresh and dry weights were recorded 3 weeks after herbicide application.

Results

The dose requirements increased significantly for most of the herbicides when application was carried out at late compared to early development stages of common ragweed. The doses of florasulam and mesotrione had to be increased by a factor 2 to 3 and the dose of MCPP by a factor 3 to 6 if spraying was delayed from the 4-leaf stage to the 8-leaf stage. In contrast there was no need of increasing the doses of glyphosate and clopyralid. If herbicide application was further delayed until the flowering stage the doses of florasulam, mecoprop and mesotrione had to be increased by a factor 14 or more and the dose of clopyralid by a factor 5 compared to the doses at the 4-leaf stage for obtaining the same efficacy level (Table 1).

Table 1. Comparison of the doses needed to obtain the same efficacy level when spraying at late vs. early growth stages

Herbicide	Dose multiplication factor for delayed treatment	
	From 4- to 8-leaf stage	From 4-leaf to flowering stage
Glyphosate	0.4	1
Clopyralid	1	>5
Florasulam	2-3	14
Mecoprop-P	3-6	15
Mesotrione	1-3	>19

Conclusions

The results show that it is possible to control common ragweed - even at late growth stages - with all the tested herbicides. However the efficacy of glyphosate was much less influenced by plant growth development than the other herbicides.