

IMPACT OF DIFFERENT HERBICIDES ON *Amaranthus spinosus* IN KOREA

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Abstract: In Korea, 315 species of exotic weeds were found from 37 families. Some exotic weeds need systematic management because weeds such as *Amaranthus spinosus*, inflicted enormous damages on environment and/or human beings and livestock. Therefore, selecting herbicides and establishment of effective weed control methods of *Amaranthus spinosus* in pasture of Korea, has been set up. Results of field testing of pendimethalin 31.7% EC in treated plots showed a weeding effect of 10%. However, pendimethalin 31.7% EC+MCPP 50% SL, MCPP 50% SL and dicamba 48.2% SL treated plots showed weeding effect of 95%, 95% and 100%, respectively. The optimum treatment period is from early June to mid July.

Key words: *Amaranthus spinosus*, exotic weeds, herbicides, weed control.

Introduction

The results of a survey showed 315 exotic weed species from 37 families during 2001 in Korea (Oh *et al.* 2002). Among exotic weeds found in the country, some weeds were adapted completely to the inland environment, while the others are adjusting and was were found in some regions of Korea. As trade of agricultural products is increased with recent liberalization of import, many seeds of exotic plants mixed with imported grain were brought in to the country. Some exotic weeds were being managed by government because of environmental and human hazards. Therefore, the spread of exotic weeds needs to be controlled at an earlier stage. *Amaranthus spinosus* was introduced in 1970's in Jeju island, Korea (Ryang *et al.* 2004; Park, 1995). This is an annual weed, mainly occurring in Jeju pasture causing damage to human and livestock as prickles and nitrate in plant, Livestock especially get poisoned by nitrate resulting in excessive cattle death. So, this study was conducted to control the troublesome exotic weed, *A. spinosus*, by several herbicides. Results of this experiment provide guidelines to effective management and prevention of spreading.

Materials and Methods

This experiment was conducted in pasture, which were densely covered with *Amaranthus spinosus* in Jeju Island, Korea. The list of herbicides to control *A. spinosus* in the field is shown in Table 1.

Table 1. The list of herbicides to control of *A. spinosus* in the field

Herbicides	Content (%)	Dosage (10a)	Remarks
Pendimethalin EC	4.5	300 ml	Soil treatment
Dicamba SL	48.2	400 ml	Foliar treatment
MCPP SL	50.0	500 ml	Foliar treatment
Triclopyr-TEA SL	30.0	500 ml	Foliar treatment
Pendi + MCPP	-	300+500 ml	-

Herbicides were treated on 24th May, 3rd June and 18th July. Weeding effect was investigated by visual estimation at 30 days after treatment (DAT).

Results and Discussion

A pre-test was conducted in greenhouse to control *A. spinosus* in pasture. Some herbicides were selected based on results of the pre-test. These were soil treatment with pendimethalin EC, and foliar treatment with dicamba SL, MCPP SL and triclopyr-TEA SL (Table 2).

Table 2. Weeding efficacy to control *A. spinosus* in a pre-test in greenhouse

Herbicide	Weeding efficacy (%) by <i>A. spinosus</i> growth stage		
	1 st Step (Plant height was less than 15 cm)	2 nd Step (Plant height was less than 30 cm)	3 rd Step (Plant height was less than 50 cm)
Alachlor EC	75 ^a	-	-
Pendimethalin EC	80 ^a	-	-
Dicamba SL	95	90	80
MCPP SL	100	100	100
Triclopyr-TEA SL	100	100	100

a - Alachlor and pendimethalin were soil treatment herbicides.

A. spinosus was controlled by pendimethalin EC + MCPP SL, dicamba SL and MCPP SL in pasture (Table 2). Pendimethalin EC, showed 80% weeding effect in greenhouse, but in open field showed a very low weeding effect (*i.e.* 10%). Because of variation of treatment time, *A. spinosus* did not germinate in greenhouse. But, in open field it did germinate.

Table 3 shows that weeding efficacy was highest from 3rd June to 18th July in treated plots. Hence, it is recommended that control of *A. spinosus* by foliar herbicides must be done from early June to early July.

Table 3. Weeding effect of *A. spinosus* by several herbicides in pasture by visual estimation at 30 days after treatment

Herbicides	Weeding effect (%) by treated time		
	24 th May	3 rd June	18 th July
Pendimethalin EC	10	-	-
Dicamba SL	80	95	95
MCPP SL	92	100	95
Triclopyr-TEA SL	20	-	-
Pendimethalin + MCPP SL	90	100	95

Literature cited

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