

Effect of NaCl on Weed Populations in Asparagus Grown on a Sandy Soil

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Abstract

Application of NaCl in Asparagus to reduce the incidence of *Fusarium* spp. was found to have also a large effect on the reduction of certain weeds species grown on a sandy soil. Largest control was obtained on *Capsella bursa-pastoris* Med., *Sonchus arvensis* L. *Stella media* Vill and *Poa annua* L. at a rate of 2 t/ha NaCl. A rate of 2+2 t/ha also gave excellent control of *Spergula arvensis* and *Anthemis arvensis*.

INTRODUCTION

Research has been carried out into the effects of NaCl application on Asparagus in the Netherlands between 1997-1999 due to the positive results obtained by Elmer (1990,1992,1995) to reduce the *Fusarium* incidence on asparagus roots.

At Applied Plant Research (former PAV) in Lelystad experiments were carried out in large wooden containers (1,83 m³) (1,51 m²) filled with a sandy soil on which asparagus was planted. In these experiments percolating drain water out the containers was collected to check on rate of leaching and mineral composition after application of up to 4 t/ha NaCl. Also asparagus yields, spear number and rust incidences caused by *Fusarium* were determined (Poll,1999). During the course of these experiments it was noted that there were large differences in number of weeds growing in the various containers. This could not be due to any chemical herbicide application since containers were handweeded. Therefore it was decided to look at the weed incidence more closely.

MATERIALS AND METHODS

The wooden containers (1,51 m²) used were filled with a typical sandy asparagus soil from the regional research farm in Meterik/ Horst in 1992. The cultivar used was Thielim. In each container six asparagus plants grew. These plants were planted in 1992. The NaCl was applied in 1997 en 1998 in February and in June each year as a split application at a rate of 2+2 t/ha or a

single application of 2 and 4 t/ha only in February. The control containers did not receive any NaCl.

The numbers of weeds in the control (no NaCl) were counted per species and in the other boxes they were expressed as a percentage of those in the control (no salt) Counting of weeds took place in 1997 and 1999 in late June. After counting the weeds the containers were handweeded. In early September each year containers were handweeded again.

RESULTS

In the table the average % reduction in weeds is given compared to the actual number of weeds in the control (no NaCl)

Table. Weed control in rates of NaCl expressed as percentage of number of weeds present in control (no NaCl). Asparagus, grown in a sandy soil, in wooden containers (1.51 m²). cv Thielim, Lelystad , late June 1997+1999.

Weed species	no weeds (no NaCl)	4 t/ha NaCl	2+2 t/ha NaCl	2 t/ha NaCl
<i>Stella media</i> Vill	72,5	82,5	60,0	91,5
<i>Capsella bursa-pastoris</i> Med.	11	100	100	100
<i>Sonshus arvensis</i> L.	7	100	100	100
<i>Galinsago parviflora</i> Cav.	20,5	92,5	80	77,5
<i>Poa annua</i> L.	112,5	98	90	85
<i>Senecio vulgaris</i> L.	12	70	60	50
<i>Anthemis arvensis</i>	8	90	100	0
<i>Spargula avensis</i>	6	100	100	60

It is clear from the data presented in the table that excellent control is obtained with 2 t/ha NaCl on the weed species *Capsella bursa-pastoris* Med. and *Sonchus arvensis* L. over the years 1997 and 1999. Also *Stella media* and to a lesser extent *Poa annua* L. were controlled by the application of 2 t/ha NaCl. *Anthemis arvensis* was not controlled at this rate of NaCl. Application of a further 2 t/ha in early June did control this weed species completely as well as *Spargula avensis* Application of 4 t/ha NaCl did not improve weed control of the various weed species much.

Interesting was the fact that *Erigeron canadensis* appears to grow better when NaCl is applied!

DISCUSSION AND CONCLUSION

Although the costs of applying NaCl just as a weed control measure will be too high compared with standard herbicides, it can be a useful weed control tool if it has to be applied to control severe Fusarium problems as is the case in many replant situations. In the Netherlands asparagus is replanted more than once on the same area due to availability of suitable soils for the production which increases Fusarium problems in asparagus. In such a situation NaCl has been shown to reduce Fusarium lesions on the roots and has also shown to increase yield, number of spears and rust incidence on the spears (Poll, 1999) and is in accordance with Elmers work in the U.S.A (Elmer, 1990, 1992, 1995). However no mention is made of any side effects on weed populations

Literature Cited

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