

Effect of Certain Herbicides on White Horsenettle (*Solanum elaeagnifolium* Cav.) under Potted Conditions

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ABSTRACT

Two pot culture experiments were conducted to evaluate the efficacy of high doses of different herbicides in the control of White horsenettle. Tordon 22K, in combination with either bromacil or 2,4-D and San H. 9789 completely prevented the establishment of the root cuttings in the experiment where herbicides were applied as pre-emergence spray. In others the reduction in establishment was more than 90 per cent. In the other experiment, Tordon 22K and San H. 9789 completely destroyed the weeds as post-emergence spray to the established weeds. The weed control ranged from 23 to 77 per cent in the rest of the treatments.

INTRODUCTION

Quite a few herbicides have been proved to be effective in varying degrees in the control of white horsenettle. All formulations of 2, 4-D controlled *S. elaeagnifolium* temporarily (Johnson, 1961). Hernandez (1966) obtained excellent control of the weed by bromocil application. San H. 9789 and Picloram were found to be effective in the control of the weed (Kailasam *et al.*, 1974). But none of them was reported to give a complete weed-free condition permanently. The present study was planned under pot culture conditions to study the effect of high doses of certain effective herbicides either alone or in combination on white horsenettle control.

MATERIALS AND METHODS

Two experiments were conducted in large sized pots 45 cm diameter at

the top and 45 cm height filled with 40 kg of air-dried soil with identical treatments (Table) replicated thrice. In one experiment the root cuttings of the white horsenettle were planted at the rate of ten per pot at 2.5 cm depth and watered sufficiently to bring the soil to field capacity. The root cuttings were 3 mm in diameter with 10 cm length. On the next day after planting, the herbicides were applied as pre-emergence spray over the soil surface as per the treatments using a mini sprayer. In the second experiment the cuttings were planted in the pots at the rate of three per pot, allowed to establish well for three months and applied with herbicides as post-emergence spray. Observations on the establishment and regeneration of the weed were made upto one year at frequent intervals.

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RESULTS AND DISCUSSION

None of the root cuttings planted, produced more than one aerial shoot. Therefore the population indirectly represented the number of root cuttings established or regenerated. Within 30 days, all the root cuttings established in the untreated control. The population was not static. It was 10/pot at 30 days, decreased to 8.7/pot at 90 days, then increased to 9.7 at 180 days and decreased to 9.3/pot at 360 days (Table). This fluctuation was probably due to the drying up of some of the shoots at certain stages and the root system which was not damaged regenerated after sometime.

Tordon 22K completely checked the establishment of the root cuttings. The establishment was only 2.3/pot till 30 days thereafter the population gradually reduced and was 0.3/pot at 360 days in the treatment with bromacil. 2, 4-D prevented the establishment till 90 days, then the establishment was 0.7/pot at 180 days and 1.0/pot at 360 days. In general, there was an increasing trend in the population which indicated the inefficacy of 2,4-D for the control of white horsenettle in the long run.

When Tordon 22 K and bromacil were mixed, the establishment was only 0.3/pot at 90 days which was

TABLE. Population of white horsenettle weed at various stages in pre-emergence and post-emergence treatments of herbicides

| Treatments | Pre-emergence application | | | | Post-emergence application | | | |
|---|---------------------------|--------------|--------------|--------------|----------------------------|--------------|--------------|--------------|
| | 30 days | 90 days | 180 days | 360 days | 30 days | 90 days | 180 days | 360 days |
| Untreated control | 10.0 (3.3) | 8.7 (3.1) | 9.7 (3.3) | 9.3 (3.2) | 3.0 (2.0) | 3.0 (2.0) | 2.7 (1.9) | 2.7 (1.9) |
| Tordon 22 K (6.0 lit./ha) | — (1.0) | — (1.0) | — (1.0) | — (1.0) | — (1.0) | — (1.0) | — (1.0) | — (1.0) |
| Bromacil (10.0 kg a.i./ha) | 2.3 (1.8) | 0.7 (1.2) | 0.7 (1.2) | 0.3 (1.1) | 0.3 (1.1) | 2.0 (1.7) | 1.3 (1.5) | 1.3 (1.5) |
| 2,4-D (10.0 kg a.i./ha) | — (1.0) | — (1.0) | 0.7 (1.3) | 1.0 (1.4) | — (1.0) | 3.0 (2.0) | 3.0 (2.0) | 2.3 (1.8) |
| Tordon 22K+2,4-D (6 lit.+10 kg a.i./ha) | — (1.0) | 0.3 (1.1) | — (1.0) | — (1.0) | — (1.0) | — (1.0) | 0.7 (1.3) | 1.0 (1.4) |
| Tordon22K+2,4-D (6 lit.+10 kg a.i./ha) | — (1.0) | — (1.0) | — (1.0) | — (1.0) | — (1.0) | — (1.0) | 1.0 (1.4) | 0.7 (1.3) |
| Bromacil+2,4-D (each at 10 kg a.i./ha) | — (1.0) | — (1.0) | 0.3 (1.1) | 0.3 (1.1) | — (1.0) | 2.0 (1.7) | 1.0 (1.4) | 1.7 (1.6) |
| San H.9789 (10 kg a.i./ha) | 6.3 (2.7) | — (1.0) | — (1.0) | — (1.0) | 1.3 (1.5) | 1.7 (1.6) | — (1.0) | — (1.0) |
| C. D. (P=0.05) | (0.16) | (0.33) | (0.39) | (0.43) | (0.32) | (0.26) | (0.27) | (0.55) |

destroyed subsequently. Combination of Tordon 22 K and 2,4-D completely prevented the establishment. Mixture of bromacil and 2,4-D prevented the establishment upto 90 days. At 180 days the establishment was 0.3/pot and it was maintained till 360 days. The establishment was 6.3/pot at 30 days in San H. 9789 but all of them were killed completely before 90 days.

There was 100 per cent control of the weed till 360 days in the treatment with Tordon 22 K alone as post-emergence application. When it was mixed either with bromacil or 2,4-D, complete control was obtained only upto 90 days. Thereafter regrowths started coming up which resulted in the reduction of the percentage control of the weed. Here the final observation was taken at 360 days.

When bromacil alone was applied the population was reduced to 0.3/pot at 30 days from an initial population of 3.0/pot, increased to 2.0/pot at 90 days, then decreased to 1.3/pot at 180 days and later maintained at the same level till 360 days. Combination of bromacil and 2,4-D controlled the weed upto 30 days only and thereafter the weed started regeneration. However, the population was not static, it was 2.0/pot at 90 days, decreased to 1.0/pot at 180 days and then increased to 1.7/pot at 360 days (Table).

Application of 2,4-D controlled the weed for 30 days only. All the weeds regenerated before 90 days which confirmed the inefficacy of 2,4-D to control the weed for a longer time. In San H. 9789 the population reduced from 3.0/pot to 1.3/pot at 30 days, increased to 1.7/pot at 90 days and resulted in complete weed free condition at 180 days and it was maintained upto 360 days.

Considering the effect of herbicides under both the conditions, Tordon 22 K alone was very effective than its combination with either bromacil or 2,4-D. Bromacil alone or its combination with either Tordon 22 K or 2,4-D showed a decreasing trend in the population which suggested that they may control the weed at later stages. San H. 9789 gave weed-free condition only after 90 days. 2,4-D controlled the weed only temporarily.

REFERENCES

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