

## A Study on the Regrowing Capacity of the Stem Cuttings of *Solanum elaeagnifolium*

By

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### ABSTRACT

Pot and field trials were conducted to study the influence of various factors on regenerating capacity of the stem cuttings of *Solanum elaeagnifolium*. Stem cuttings older than 60 days regenerated within 10 days. The larger the size of the cuttings (upto 10 cm) the earlier the regeneration. Stem cuttings of 10 cm length placed at depths greater than 45 cm did not regrow. In another experiment, the regenerating capacity of the stem cuttings was completely reduced when the loss of moisture was almost equal to its total moisture holding capacity.

### INTRODUCTION

*Solanum elaeagnifolium* commonly referred as white-horse nettle in English and 'Kattukandankathiri' in Tamil is a gregarious perennial weed of black soils of Coimbatore district of Tamil Nadu. The weed has well ramified, thick and fleshy roots and hardy stems helping the plant to perpetuate under moist as well as dry situations. Thick, fleshy deeply penetrating roots and branching stem store large quantities of food materials to remain dormant in soil for a considerable length of time even under adverse conditions. When conditions are favourable, they start putting forth fresh growth. Application of 2, 4-D at a rate of 2 lb/ac was successful in controlling this weed for a period of eight weeks. A sorghum crop also tends to suppress the spread of the weed. Balasubramaniam and Saktharam Rao (1968) and Sundararaj and Balasubramaniam (1970) also

suggested 2, 4-D either in the form of sodium salt or amine to control this weed. Narayanan and Meenakshisundaram (1955) reported this weed to reproduce itself by seeds and creeping roots. When the shoot is cut, regrowths appeared within 20 days from deep roots.

### MATERIALS AND METHODS

Pot culture trials were undertaken at the Pesticides Testing Laboratory, Coimbatore and field trials at Chinnapoolankinar of Udumalpet, Coimbatore district to study the factors affecting the regenerating capacity of the portions of stem of *Solanum elaeagnifolium* present in the soil upto a depth of 30 cm

At Chinnapoolankinar, plots heavily infested with this weed were selected to study the age at which the stem cuttings have high regenerating capacity. The weeds were weeded

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with a mummatty to a depth of 22.5 to 30 cm and the plots were sufficiently watered. A set of six underground stem cuttings of 10 cm length were removed on the 15th, 30th, 60th, 75th and 90th day after the appearance of fresh growth at 4 cm depth to previously prepared beds for studying the minimum age required for regeneration.

In another trial to find the minimum length of stem cuttings required for regrowth within a short period, stem cuttings of 75 days old (based on the results of previous trial) were collected and were cut to 1, 2.5, 5.0, 7.5 and 10.0 cm length. Six such cuttings in each length groups were planted in separate pots of 4 cm depth. The time taken for each cutting to put forth fresh growth was recorded. Simultaneously 36 stem cuttings of 10 cm length and about 75 days old were collected and planted at 5, 10, 15, 22.5, 30 and 45 cm depth. The plots were irrigated appropriately and the emergence of fresh growth above the soil was observed for 90 days. The average number of days for each treatment was recorded. In the next study, 36 stem cuttings of 10 cm length from sufficiently older stem were collected and were divided into six sets of six each. After recording the individual weight of all the 36 fresh cuttings, one set of stem cuttings was planted at 4 cm depth in 22.5 cm diameter pot containing 10 kg soil. This set was taken as control. The rest of the sets were exposed to sunlight on a bright sunny day for periods of 2, 4, 6, 8 and 10 hours to encourage dessication. After exposure individual

cutting was weighed to record loss of moisture. The average percentage of loss of moisture for each set was recorded. At the end of exposure the stem cuttings were planted in similar pots (as described above) and all the pots were watered regularly. Observations on the number of days taken for each cutting to regenerate was recorded for ninety days.

## RESULTS AND DISCUSSION

The data on the study of the age of stem cuttings in relation to regeneration are presented in Table 1.

TABLE 1. Regeneration of stem cuttings of different age gradation

Age of fresh cuttings (days)	Regenerated or not
15	No regeneration
30	-do-
45	-do-
60	50 per cent regenerated
75	100 per cent regenerated
90	100 per cent regenerated

It is found that stem cuttings below 45 days old did not regenerate even on the 90th day. Of the six cuttings of 60 days old only 3 cuttings regenerated. All the older stem cuttings of 75 and 90 days old regenerated within 10 days to survive.

In the study on the optimum length of stem cuttings required for regeneration none of the cuttings of one cm length regrew even after 45 days (Table 2). Of the rest, it took on an average 23, 16, 10 and 7 days respectively for cuttings 2.5, 5, 7.5 and



TABLE 2. Length of stem cuttings and regeneration

Length (cm)	Day for regeneration	Wet weight of cuttings (g)
1.0	No regeneration	0.34
2.5	23	0.77
5.0	16	1.67
7.5	10	1.30
10.0	7	1.89
C. D.	6.46	

10 cm length for regeneration. The difference in the time taken by cuttings of 7.5 cm and 10 cm length to regenerate was only 3 days indicating that cuttings of 7.5 cm length and above will be able to regenerate within 10 days. Generally it is found that upto 10 cm in length, the longer the stem cuttings, the shorter the time required for regrowth. This can be based on the availability of more food material for regeneration.

In the study on the depth of planting, the 10 cm long cutting placed at 5 cm depth regrew within 7 days while the stem cuttings placed at 10, 15, 22.5 and 30 cm depth took on the average 15, 22, 30 and 43 days respectively to regenerate (Table 3). The cuttings placed at 45 cm did not show any growth even on the 90th day.

TABLE 3. Depth of planting and regeneration of cuttings.

Depth of planting (cm)	No. of days taken for regeneration
5.0	7
10.0	15
15.0	22
22.0	30
30.0	43
45.0	Not emerged
C. D.	1.6

TABLE 4. Regeneration in relation to dessication

Dessication	* Days taken for regeneration	% of loss of moisture
No. exposure control	7 days	Nil
2 hours	10 days	24.7
4 hours	11 days	28.7
6 hours	21 days	37.4
8 hours	38 days	48.9
10 hours	Not regenerated	50.1
C. D.	1.5	3.10
Maximum moisture holding capacity of stem bits is		58.0%

\*Mean of 6 readings rounded off to the nearest whole numbers.



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In the study on the undessication, stem cuttings were able to grow within 7 days while those exposed for 2, 4, 6 and 8 hours took 10, 11, 21 and 38 days respectively to put forth fresh growth. Ten hours of exposure causing a loss of 50.1 per cent moisture close to its total moisture holding capacity (58.1) per cent did not induce any growth.

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