

Effect of Seed Treatment with Tillex and Ceresan on *Rhizobium* Groundnut Symbiosis¹

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ABSTRACT

Seed treatment with Tillex at the rate of 2 g/kg of seed both after and before *Rhizobium* - inoculation, slightly increased the growth and dry matter weight of the groundnut plants. Nodulation and total nitrogen content of the plants and the yield of pods were reduced in Tillex-*Rhizobium* combinations. Treatment with Ceresan after *Rhizobium* inoculation reduced the growth, dry matter weight, nodule number, leghemoglobin content of the nodules and total nitrogen content of the plants. Ceresan treatment before *Rhizobium* - inoculation increased the same. The yield of the pods was increased in Ceresan - *Rhizobium* combinations.

INTRODUCTION

Inoculation of groundnut seeds with *Rhizobium* cultures to increase nodulation is practiced commonly. Seed treatment with fungicides is also done to afford protection against seed-borne and soil-borne pathogens. The nodule bacteria are reported to be quickly destroyed by contact with most of the chemicals used as seed protectants (Ruhloff and Burton, 1951). There are reports to reveal the compatibility of many seed dressing chemicals at the recommended level for use with rhizobia inoculated to the seed (Mukewar and Bhide, 1969; Balaraman and Prasad, 1972; Sardeshpande *et al.*, 1973). In the present

study an attempt was made to study the effect of seed treatment of Tillex (Ethyl mercury chloride) and Ceresan (Phenyl mercury chloride) along with *Rhizobium* inoculation on the symbiotic nitrogen fixation in groundnut under field conditions.

MATERIALS AND METHODS

The *Rhizobium* inoculum was multiplied in the broth of Base medium '79' and mixed with sterilized clay soil which served as the carrier material. TMV. 7 groundnut seeds were treated with the carrier material containing the inoculum. The fungicides each at the rate of 2 g/kg of seed were treated either before or after *Rhizobium*

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inoculation: Treated inoculated seeds were dibbled in the field, laid out with randomized block design and supplied with farm yard manure. The growth, dry matter weight, nodulation and total nitrogen content of the plants and leghemoglobin content of the nodules were recorded on 40th day and the pod yield was recorded after sun drying the pods. Leghemoglobin content of the nodules was estimated by the method of Schiffman and Label (1970) and the total nitrogen content was estimated by the method of Bremner (1960).

RESULTS AND DISCUSSION

Growth and dry matter increased in Tillex-*Rhizobium* combinations (Table), whereas, nodulation, total nitrogen content of the plant, leghemoglobin content of the nodules and yield were decreased. This deleterious effect is more when Tillex was treated after

Rhizobium inoculation. This may be due to the effect of chemical on the inoculated *Rhizobium* (Milthorpe, 1945). This result is in conformity with that of Sardeshpande *et al.* (1973).

Ceresan treatment before *Rhizobium* inoculation favoured the symbiotic efficiency, whereas treatment after *Rhizobium* inoculation, decreased the same indicating the unfavourable effect of the chemical on *Rhizobium* when treated after *Rhizobium* inoculation. An increase in dry matter weight and total nitrogen content of the groundnut plant due to Ceresan treatment and *Rhizobium* inoculation was reported by Balaraman and Prasad (1973). Sardeshpande *et al.*, (1973) reported that Ceresan treatment before *Rhizobium* inoculation was found beneficial. The results of the present study are in conformity with the above reports.

TABLE. Effect of seed treatment with Tillex and Ceresan on *Rhizobium* - groundnut symbiosis

Treatment	Growth in cm/plant*	Dry matter weight in g/plant*	Total nitrogen content in g/100 g	Total no. of nodules/plant*	Leghemoglobin content in mg/g of fresh nodules	Pod yield in g/plot
Uninoculated control	25.3	2.275	1.77	28	2.05	436.20
<i>Rhizobium</i> (Inoculated control)	33.6	2.820	2.37	46	3.22	512.30
Tillex	25.7	2.300	1.63	25	1.96	413.30
<i>Rhizobium</i> + Tillex	34.2	2.870	2.17	38	3.17	487.50
Tillex + <i>Rhizobium</i>	35.5	2.965	2.28	43	3.20	500.80
Ceresan	26.4	2.310	1.94	33	2.23	420.70
<i>Rhizobium</i> + Ceresan	31.7	2.760	2.30	43	3.17	536.60
Ceresan + <i>Rhizobium</i>	37.4	3.120	2.49	52	3.48	541.00

* Mean of 10 observations.

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