Nodulation of legumes on new light land. 3. The effect of Rogor seed treatment on legume nodulation

O M. Goss

W. A. Shipton

Follow this and additional works at: https://researchlibrary.agric.wa.gov.au/journal_agriculture4

Part of the Agronomy and Crop Sciences Commons, and the Plant Pathology Commons

Recommended Citation
Available at: https://researchlibrary.agric.wa.gov.au/journal_agriculture4/vol6/iss11/6

This article is brought to you for free and open access by Research Library. It has been accepted for inclusion in Journal of the Department of Agriculture, Western Australia, Series 4 by an authorized administrator of Research Library. For more information, please contact jennifer.heathcote@agric.wa.gov.au, sandra.papenfus@agric.wa.gov.au, paul.orange@dpird.wa.gov.au.
NODULATION OF LEGUMES ON NEW LIGHT LAND

3. The effect of Rogor seed treatment on legume nodulation

By OLGA M. GOSS and W. A. SHIPTON, Plant Pathology Branch

SEED treatment with systemic insecticides is widely used for the control of insect pests. However, when seed inoculation is necessary for pasture establishment, seed treatment with insecticide is not advisable. A field experiment conducted at Badgingarra Research Station in 1964 showed that the systemic insecticide Rogor was very damaging to the applied rhizobia even when the treated seed was held for a month before inoculation.

Materials, Experimental Site and Procedures

Site and Fertiliser

The experiment was conducted on newly cleared light land where inoculation was necessary for legume establishment. Fertiliser treatments were the same as described in previous articles in this series.

Legumes tested: Geraldton subterranean clover, Kondinin rose clover, Cyprus barrel medic, lucerne, field peas, vetch.

Seed Treatments

For each of the above legumes, seed samples were prepared as follows:

(1) Seed Rogor-treated at commercially recommended rates, held one month, then inoculated and lime pelleted.

(2) Seed Rogor-treated, held one week, then inoculated and lime pelleted.

(3) Seed Rogor-treated, held one day, then inoculated and lime pelleted.

(4) Seed Rogor-treated, then inoculated and lime pelleted immediately.

(5) No Rogor treatment, but seed inoculated and lime pelleted.

(6) No Rogor treatment and no inoculation, but seed lime pelleted.

Standard commercial peat cultures were used at the rates recommended to farmers.

All the inoculation and lime pelleting treatments were done on the same day.

Sowing

The seed was sown at a depth of 1 in. to 1½ in. through a combine drill. The soil was dry at sowing and rain did not fall until three weeks later. The experiment was sown in a randomised design, there being two replications for each treatment.

Nodulation Assessment

Nodulation assessments were made as described in the previous articles. The maximum nodulation value per plot was 200.

Results

The nodulation assessments are shown in the Table. Typical growth differences are illustrated in the photograph of the subterranean clover plots.
The effect of Rogor treatment on nodulation

The effect of Rogor seed treatment on the nodulation of various legumes. The seed was held for periods of up to one month, after being treated with Rogor, before being inoculated and lime pelleted. All seed lots were lime pelleted and all except the control were inoculated.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Geraldton Subterranean Clover</th>
<th>Kondinin Rose Clover</th>
<th>Lucerne</th>
<th>Cyprus Barrel Medic</th>
<th>Field Pea</th>
<th>Vetch</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Rogor. Inoculated and pelleted (Standard)</td>
<td>194.0</td>
<td>160.0</td>
<td>140.0</td>
<td>152.5</td>
<td>200.0</td>
<td>197.0</td>
</tr>
<tr>
<td>Seed Rogor—treated, held 1 month. Inoculated and pelleted</td>
<td>102.0</td>
<td>20.0</td>
<td>48.5</td>
<td>19.5</td>
<td>127.5</td>
<td>80.0</td>
</tr>
<tr>
<td>Seed Rogor—treated, held 1 week. Inoculated and pelleted</td>
<td>105.5</td>
<td>8.0</td>
<td>21.5</td>
<td>16.0</td>
<td>86.0</td>
<td>73.5</td>
</tr>
<tr>
<td>Seed Rogor—treated, held 1 day, Inoculated and pelleted</td>
<td>109.5</td>
<td>15.0</td>
<td>20.5</td>
<td>17.5</td>
<td>109.5</td>
<td>92.0</td>
</tr>
<tr>
<td>Seed Rogor—treated, inoculated and pelleted at the same time</td>
<td>16.0</td>
<td>4.5</td>
<td>0.5</td>
<td>7.0</td>
<td>49.5</td>
<td>17.5</td>
</tr>
<tr>
<td>Control: No Rogor, no inoculation but pelleted</td>
<td>39.0</td>
<td>13.0</td>
<td>0.0</td>
<td>3.5</td>
<td>36.5</td>
<td>16.0</td>
</tr>
</tbody>
</table>

Figures linked by the unbroken lines are not significantly different from one another at the 0.01 probability level.

Nodulation differences for significance.  
$P < 0.05 = 33.6.$
$P < 0.01 = 45.3.$
$P < 0.001 = 60.1.$

Journal of Agriculture, Vol 6 No 11 1965
The data indicate the following points:

1. Rogor applied as a seed treatment prior to or at the same time as inoculation and lime pelleting is very damaging to the applied rhizobia.
2. Poor establishment was obtained even when the Rogor treated seed was held for one month before inoculation and lime pelleting was carried out.
3. Legume-Rhizobium combinations vary to some extent in their tolerance to Rogor seed treatment. Geraldton subterranean clover, peas and vetches showed the best nodulation after Rogor treatment.

Discussion

The results of this experiment show that in areas where inoculation is essential for establishment, use of Rogor seed treatment will result in very poor stands. A similar experiment conducted in an area where inoculation was not essential (that is, the uninoculated controls became satisfactorily nodulated) gave somewhat different results. Although early in growth, treatment 5 appeared best, the differences between treatments evened out towards the end of the growing season.

The deleterious effect of Rogor on rhizobia was also demonstrated by Vincent (personal communication) in laboratory tests. A number of other insecticides have been shown to be harmful to bacteria, including Aldrin, Dieldrin, Chlordane, D.D.T., B.H.C., lindane, and parathion (Braithwaite et al, 1958; Brakel, 1963).

Fungicides in common use are similar to insecticides in their effect on nodulation (Brinkerhoff et al, 1954; Williams et al 1960).

RECOMMENDATION

The systemic insecticide Rogor should not be used as a seed treatment for legumes when seed inoculation is essential for establishment.

REFERENCES


Greatest advance in haycutting history

new Page haymaker

Hay dries faster ● Maintenance drops to about £5 a year ● No stoppages
No sharpening ● Less raking ● Grass slightly lacerated for even drying
● Standard equipment includes 3 sets of blades, mulching plates, spring loaded back flaps, dual t.p.l. pins, deflector plate

There are eleven new features in this season's Page haymaker. Amazing advances that make Page again the leaders in the rotary method of cutting hay.

You won't believe your eyes until you see this king of haycutting in action. 5 ft. and 6 ft. models, trailing or semi-trailing, T.P.L. with or without caster wheels.

Get a free demo. Clip coupon now. This season, save yourself hours of work. Let Page put more money in your pocket.

LAWRENCE MARSHALL, MARMA DOWNS, ROSEBUD, VIC., WRITES:
"Last season I cut 6000 bales of Clover, Rye Grass, Lucerne, and Oaten Hay. Page slasher cuts the hay any measured distance from the ground, leaving it in an even windrow. It was not necessary to sharpen or replace any blades. I recommend Page Slasher as a very reliable, time saving machine."

PAGE

This coupon is worth $$'s to you in time and money. Fill in your name and address and mail tonight to A. V. Page Pty. Ltd.

Vic., Tas. & S.A
28 Teton Court,
Moorabbin, Victoria

N.S.W.
84 Dartbrook Road,
Auburn.

Queensland
69 Mayne Road,
Mayne.

W.A.
30 Woolwich Street,
Leederville.

Please mention the "Journal of Agriculture of W.A." when writing to advertisers.