



### THE QUESTION

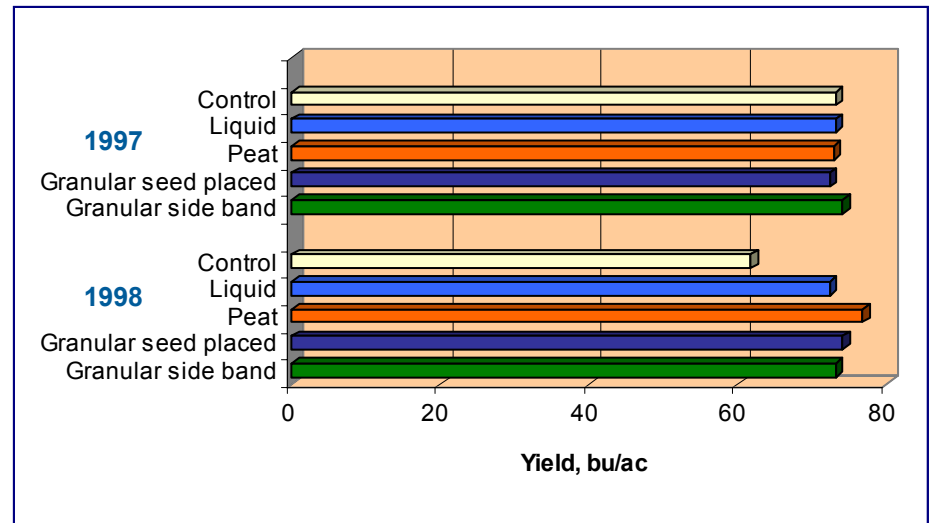
How effective are seed placed and side-banded granular inoculants compared to the traditional seed applied peat and liquid formulations for irrigated pea?

### INTRODUCTION

Pea is generally considered to be a good nitrogen fixing species capable of supplying a large portion of its N requirements through N fixation when inoculated with an appropriate *Rhizobium* strain (LaRue and Patterson, 1981). The amount of N derived from fixation in any given year, or any given location, is highly variable and depends on a number of factors including environmental conditions, soil fertility and general crop health (Rennie and Dubetz, 1986; Bremer et al., 1988; Kucey, 1989; Androsoff et al., 1995). Management strategies that maximize nitrogen fixation ultimately contribute to higher pea yields.

Application of commercial inoculants containing *Rhizobium leguminosarum* biovar *viceae* with pea seed is one management strategy used to enhance nitrogen fixation. Inoculants are typically applied as peat based powders or liquid formulations directly to the seed coat prior to seeding. Manufacturers have developed and formulated inoculants as granules.

Figure 1. Granular inoculants are effective on irrigated pea



In the granular form, the *Rhizobium* inoculant is applied in the soil. When compared with more traditional seed-applied formulations, granular inoculants have been shown to lead to better nodulation and higher seed yields (Bezdicsek et al., 1978; Brockwell et al., 1980).

### RESULTS

No trends indicated that any one specific inoculant formulation was superior for irrigated Carneval pea (Figure 1).

In 1997, inoculation with rhizobial treatments did not significantly enhance seed yield compared to the control. In 1998, seed yield was lowest for the control treatment and was significantly increased with application of all inoculant formulations (Figure 1). No effect of inoculation on seed

weight was observed in 1997 or 1998 compared to the control treatment (results not shown).

Relatively high soil available nitrogen levels in both years may have masked inoculant treatment effects. Results from work conducted in Alberta indicated that inoculant application to pea was variable and only produced a significant response 41% of the time (McKenzie et al., 2001). However, the Alberta work concluded that rhizobia inoculation is a cost-effective way to ensure maximum pea yields are obtained.

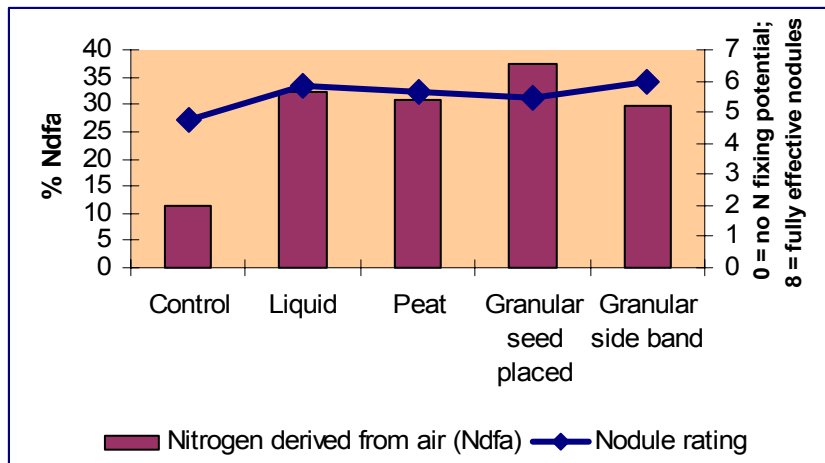
In 1997, several inoculants enhanced nodule rating as compared to the control treatment. As well, N fixation, though variable, was enhanced for all the inoculant formulation treatments compared to the

control treatment (Figure 2). In 1998, nodule rating showed little difference between the non-inoculated treatment and the inoculated treatment.

N fixation was low and variable with highest levels observed for granular seed placed and peat formulations. This was probably due to relatively high soil available nitrogen levels. Presence of high soil available nitrogen levels has been shown in previous research to eliminate the effect of rhizobium inoculants (Evans et al. 1996).

Although nitrogen fixation levels were variable and relatively low, seed yields associated with granular inoculant treatments were generally high and as good as the other inoculant formulations. These results are in keeping with reports by others who have similarly observed that granular inoculants are as effective, or better, than liquid and peat-based powders (Bezdicsek et al., 1978; Brockwell et al., 1980; Lafond and Johnston, 1998; Rice et al., 2000).

Figure 2. Nitrogen fixing ability is similar between inoculant formulations.



**The Study Details**

**Location:** CSIDC **Variety:** Carneval yellow pea  
**Seeding rate:** 80 plants / m<sup>2</sup> **Fertilizer:** 45 lb/ac 12-51-0 seed placed  
**Weed Control:** Ethylfluralin (Edge) pre-plant incorporated; bentazon (Basagran) and sethoxydim (Poast) applied post-emergence  
**Treatments:**  
 Granular – MicroBio Rhizogen (MBR) and Liphatec seed-placed and sidebanded;  
 Liquid – MicroBio Rhizogen (MBR) and Liphatec seed-applied;  
 Peat – MicroBio Rhizogen and Liphatec seed-applied.



Funded by the Canada-Saskatchewan Agri-Food Innovation Fund and Agriculture and Agri-Food Canada, PFRA

**The Bottom Line...**

Granular inoculant formulations are as effective as the traditional peat and liquid formulations for field pea grown under irrigation.

**References**

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