

# FIELD PEA INOCULATION TRIAL

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**A field pea inoculation trial** was conducted at the NDSU Carrington Research Extension Center to compare inoculant treatments submitted by commercial manufacturers / distributors to an absolute control (no inoculum, no N fertilizer) and a treatment with 60 lbs. total N (soil test + fertilizer) / acre.

The experiment was installed on a Heimdal silt loam soil. A soil test the previous fall indicated 31 lbs. NO<sub>3</sub><sup>-</sup>-N / acre in the top 24 inches and adequate phosphate. Cultivar ‘Integra’ (yellow-cotyledon) was sown at the rate of 300,000 live seeds / acre on 22 May in a randomized complete block design with four replicates. Individual plots were seven 7” rows wide x 25’ long. Weeds were effectively controlled with a preplant application of Sonalan and post-emergence hand roguing. Disease and insect pests were not detected. Although the plants lodged considerably during the

reproductive phase, lodging was uniform across the trial and not related to individual treatments.

Early stand counts showed a trial mean of 75 percent of the target population (Table 1). This phenomenon has been observed previously, with no indication of the causal agent. Although treatments varied considerably in stand establishment, variability was high and no statistically significant differences were observed in stand or early vigor. Fifteen of the 17 inoculation treatments were numerically superior to the control in nodulation and four were significantly better. However, these differences were not translated into significantly higher yield. No significant differences among treatments were observed in any of the harvest parameters measured.

**Table 1. Field pea inoculation treatment effects on plant stand and nodulation, Carrington, 2003.**

| Treatment                               | Formulation   | Stand on 11 June (plants/acre) | Early Vigor (1-9) <sup>1</sup> | Nodulation on 21 July (1-9) <sup>2</sup> | Grain Yield (lb/acre) | Test Weight (lb/bushel) | Seed Weight (g/250) | Grain Protein (%) | N Yield (lb/acre) |
|---|---------------|--------------------------------|--------------------------------|--|-----------------------|-------------------------|---------------------|-------------------|-------------------|
| Control                                 | ---           | 257,000                        | 2.0                            | 4.3                                      | 3879                  | 64.4                    | 59.2                | 19.7              | 763               |
| N Fertilizer <sup>3</sup>               | ---           | 209,000                        | 1.8                            | 4.0                                      | 3748                  | 64.7                    | 58.4                | 18.8              | 705               |
| BioRhiz                                 | Liquid        | 243,000                        | 1.9                            | 2.8                                      | 3915                  | 64.1                    | 56.9                | 19.5              | 762               |
| CellTech-C                              | Liquid        | 183,000                        | 2.0                            | 3.0                                      | 3716                  | 64.0                    | 57.8                | 19.4              | 719               |
| CellTech-PCI                            | Liquid        | 235,000                        | 2.3                            | 3.3                                      | 3768                  | 64.1                    | 57.4                | 19.4              | 733               |
| Experimental C BU Liquid                | Liquid        | 259,000                        | 2.0                            | 3.5                                      | 3936                  | 64.2                    | 56.6                | 19.3              | 759               |
| Experimental G Nodulator                | Granular      | 219,000                        | 2.3                            | 4.3                                      | 3610                  | 64.2                    | 57.6                | 19.3              | 698               |
| NitraStick-C Nitragin                   | Peat          | 258,000                        | 2.3                            | 3.8                                      | 3836                  | 64.0                    | 57.2                | 19.5              | 748               |
| NitraStick-C Protec                     | Pre-inoculant | 220,000                        | 2.3                            | 4.3                                      | 3869                  | 64.2                    | 58.5                | 19.6              | 758               |
| Nodulator                               | Granular      | 244,000                        | 2.0                            | 3.5                                      | 3890                  | 64.3                    | 58.2                | 19.4              | 755               |
| RhizoFlo                                | Granular      | 237,000                        | 2.3                            | 3.0                                      | 4148                  | 64.4                    | 56.6                | 19.2              | 797               |
| SelfStik                                | Peat          | 217,000                        | 2.0                            | 3.3                                      | 3876                  | 63.9                    | 56.3                | 19.4              | 752               |
| SelfStik Experimental B                 | Peat          | 244,000                        | 2.0                            | 5.0                                      | 3892                  | 64.1                    | 56.7                | 19.1              | 744               |
| SelfStik + Experimental A               | Peat          | 196,000                        | 2.3                            | 3.3                                      | 3585                  | 63.9                    | 57.8                | 19.5              | 699               |
| SelfStik + Exp A Phosphate Solubilizer  | Peat          | 240,000                        | 2.3                            | 2.8                                      | 3836                  | 64.0                    | 57.1                | 19.7              | 757               |
| SelfStik + Experimental E               | Peat          | 221,000                        | 2.3                            | 3.3                                      | 3788                  | 64.2                    | 58.3                | 19.6              | 742               |
| SelfStik + Exp B1 Phosphate Solubilizer | Peat          | 197,000                        | 2.0                            | 3.5                                      | 3697                  | 64.1                    | 57.4                | 19.3              | 712               |
| SelfStik + Exp B2 Phosphate Solubilizer | Peat          | 221,000                        | 2.3                            | 4.0                                      | 3649                  | 64.1                    | 58.6                | 19.1              | 699               |
| SelfStik + Exp C Phosphate Sobubilzer   | Peat          | 234,000                        | 2.0                            | 4.3                                      | 4067                  | 64.3                    | 57.8                | 19.5              | 792               |
| TagTeam                                 | Peat          | 198,000                        | 2.0                            | 4.0                                      | 3677                  | 64.2                    | 58.4                | 19.3              | 710               |
| Ndure                                   | Peat          | 199,000                        | 2.3                            | 3.8                                      | 3443                  | 64.5                    | 57.8                | 19.9              | 684               |
| Mean                                    | ---           | 225,000                        | 2.1                            | 3.6                                      | 3801                  | 64.2                    | 57.7                | 19.4              | 738               |
| C.V. (%)                                | ---           | 21.4                           | 16.6                           | 20.4                                     | 8.7                   | 0.5                     | 2.4                 | 2.3               | 8.5               |
| P-value                                 | ---           | 0.64                           | 0.70                           | 0.004                                    | 0.51                  | 0.07                    | 0.26                | 0.34              | 0.47              |
| LSD (0.05)                              | ---           | NS                             | NS                             | 1.1                                      | NS                    | NS                      | NS                  | NS                | NS                |
| LSD (0.01)                              | ---           | NS                             | NS                             | 1.4                                      | NS                    | NS                      | NS                  | NS                | NS                |

<sup>1</sup>1 = very vigorous, 9 = dead

<sup>2</sup>1 = profuse nodulation, 9 = no nodules

<sup>3</sup>60 lbs total N (soil test + fertilizer)