Performance of Rhizobial Inoculant Formulations in the Field

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Introduction

Over the years, a number of studies have been conducted in western Canada to examine the impact of rhizobial inoculant formulation on the success of various Rhizobium/legume associations. The introduction of granular inoculant formulations in the 1990s stimulated a new flurry of research activity and throughout the latter portion of the decade, a number of projects were conducted to compare the efficacy of this new formulation to liquid and peat-based powders. Coincidentally, at the same time that the new granular formulations were being introduced into the prairie market, the introduction and rapid expansion of desi- and kabuli-type chickpea production in Saskatchewan served to further stimulate inoculant research activity. As a consequence, a considerable body of research data has been amassed for a variety of pulse crops in which performance comparisons have been made between various inoculant formulations.

Historical Perspective

Inoculation for legumes has long been a topic of considerable interest in the prairie region of western Canada for farmers and researchers alike. Indeed, the first agricultural extension bulletin of the University of Saskatchewan, College of Agriculture (6), written by Professor Roy Hansen and published in 1922, was entitled “Inoculation for Legumes”. In this bulletin, Professor Roy provided guidance for farmers regarding inoculation strategies:

“Collect soil from a field that was known to have had well inoculated plants, as evidenced by the presence of nodules on the roots. Thoroughly air-dry this soil, though not in sunlight, and run through a sieve to remove lumps and trash. Spread out the seed on a smooth floor and moisten (not wet) with a five percent glue solution (one-half pound of furniture glue to one gallon of water). Then sift on to the moist seed, the dried, pulverized soil, using two to three quarts of soil per bushel of seed, meanwhile shoveling over the seeds until they are uniformly dirty.”

Clearly, we have moved well beyond inoculating seeds with soil and furniture glue. However, with the increasing inoculation strategy options currently available to farmers, including new formulations and delivery systems, there is a continuing need to evaluate the efficacy of these different strategies from both agronomic and economic standpoints.