

## Project Report

### Title: Management of Bacterial Blight in Field Pea Using Pesticide Compounds

Venkat Chapara and Amanda Arens

A research trial was conducted at the Langdon Research Extension Center with an objective to evaluate the performance of pesticide compounds to manage bacterial blight (BB) on field pea. The trial was planted on May 12, 2021 with the field pea variety 'Salamanca' in a randomized complete block design replicated four times. The trial followed state recommended practices for land preparation, fertilization, seeding rate, and weed control. The plot size was 5 ft. wide x 16 ft. long with a field pea border on either side of each plot. Pesticide compounds were applied at the Vn stage (nth true leaf unfolded at nth node with tendrils present) using a CO<sub>2</sub>-pressurized backpack style sprayer with a three-nozzle boom (XR-8002) at 20 GPA. Prevailing weather conditions were dry during the crop growth period so the second spray at R-stage was not applied. The amount of BB infection obtained in the research plots was based on natural infections. A rating scale of 0 – 9 was adopted from Chaudhary 1996, where the severity of BB in a plot was recorded as the percentage of tissue area infected out of total leaf area examined. Fifty leaves from each plot were sampled and measured for the average percentage of lesion area. The rating scale was 0 = 0, 1 = >1-10 %, 3 = >11-30 %, 5 = >31-50 %, 7 = >51-75 %, and 9 = >76-100.

A Disease Index (DI) was calculated based on severity ratings using a formula:

$$DI = \frac{n(1) + n(3) + n(5) + n(7) + n(9)}{tn}$$

Where: n (1), n (3), n (5), n (7) and n (9) = Number of leaves showing severity score of 1, 3, 5, 7 and 9. tn = Total number of leaves scored

**Results:** Dry weather during the major part of the growth stages influenced bacterial blight incidence on field pea (Figure 1). There were no significant differences in the bacterial blight index (average ranged from 0.1 to 0.2 which was less than 1% of bacterial blight severity on the total rated leaves), yield (at 13.5% moisture), and test weight (Table 1) among the pesticide compounds tested and on comparison to the non-treated check (p-value non-significant).

**Figure 1:** Low levels of bacterial blight infections observed on lower leaves of field pea plants.



**Table 1:** Efficacy of pesticide compounds in managing bacterial blight of field pea and their influence on yield and test weight.

<b>Treatments</b>	<b>Rate</b>	<b>Bacterial Blight</b> DI (1-9)*	<b>Yield</b> (bu/a)	<b>Test Weight</b> (lbs/bu)
Kocide (Copper Hydroxide)	5 lbs/a	0.1	59	65
Copper Sulfate	5 lbs/a	0.2	58	65
Guarda	3.3 liters/a	0.2	63	65
Zinc Oxide	400 ppm	0.1	63	65
Zinx Oxide	800 ppm	0.2	59	65
Surround WP	10 lb/a	0.1	65	65
Resozurin Sodium Salt	10 mg/a	0.2	61	65
Kanamycin	50 ppm	0.2	59	65
Streptomycin sulfate	200 ppm	0.1	59	65
Oxidate	1% V/V	0.2	56	65
Non-Treated Check	CHK	0.1	57	65
Mean		0.14	60	65
CV%		46	11	0.51
LSD		NS	NS	NS
P-Value (0.05)		NS	NS	NS

\* DI = Disease Index

NS: Non-significant

**Reference:** Chaudhary, R. C. 1996. Internationalization of elite germplasm for farmers: Collaborative mechanisms to enhance evaluation of rice genetic resources. Paper presented in: MAFF, International workshop on genetic resources held in Fukuyi, Japan Oct.22-24, 1996; pp.

221. [The 4th MAFF International Workshop on Genetic Resources: Characterization and Evaluation - New Approach for Improved Use of Plant Genetic Resources \(affrc.go.jp\)](http://affrc.go.jp)

**Acknowledgements:** North Dakota Product Harmonization Board and National Pulse Growers Association for funding this project.