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 18, 2022 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 tendril present) using a CO_2-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 the 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: Favorable weather during the major part of the growth stages was congenial for bacterial blight incidence on field pea (Figure 1). There were no significant differences in the bacterial blight index (average ranged from 19 to 35%) on foliage, 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: High levels of bacterial blight infections were observed on field pea plants.
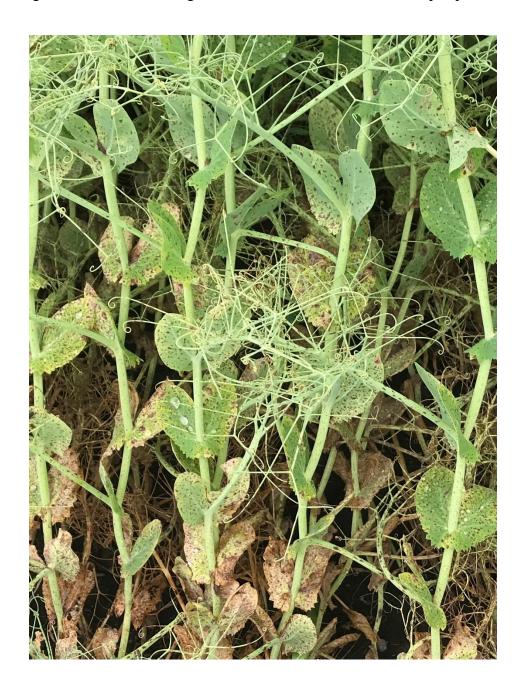

Table 1: Efficacy of pesticide compounds in managing bacterial blight of field pea and their influence on yield and test weight.

| Treatments | Rate | Bacterial Blight | | | Yield | Test Weight |
		Incidence (%)	Severity (%)	INDEX	(bu/A)	(lbs/bu)
Kocide (Copper Hydroxide)	3-6 lbs/a	45	51	25	61	64
Copper Sulfate	3-6 lbs/a	47	47	23	55	65
Guarda	3.3 lts/A	43	55	26	65	64
Zinc Oxide	400 mg	43	49	23	54	64
Zinx Oxide	800 mg	49	70	35	62	64
Surround WP	½ lb/gallon of water	48	64	31	57	65
Resozurin Sodium Salt	10 mg/a	46	58	28	55	64
Kanamycin	50 µg/ml	50	62	31	58	65
Streptomycin sulfate	3-6 lbs/a	47	62	30	60	64
Oxidate	1% V/V	50	40	19	53	64
Non-treated Check	CHK	50	67	34	62	64
Mean		**46**	**57**	**28**	**58**	**64**
P-Value (0.05)		**NS**	**NS**	**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)