Management of *Ascochyta* Blight in Chickpea and Determination of U.S. Pathotypes and Sensitivity to Fungicides

Bob Henson, Carl Bradley, Weidong Chen, Kent McKay, Eric Eriksmoen, and Steve Metzger

Summary of Progress: Trials evaluating six chickpea cultivars (representing the three major market classes) in combination with five fungicide programs were successfully established in Carrington, Minot, and Hettinger. The results indicate that the smaller-seeded cultivars are less susceptible to Ascochyta blight than the large kabulis. Under low to moderate disease pressure, the stobilurin fungicides and Bravo have significantly reduced disease symptoms and increased yield and profitability. A large number of samples of Ascochyta-infected plant tissue was collected in the Northern Great Plains and Pacific Northwest. To date, pathotyping at Washington State University has shown a predominance of Pathotype II. Studies on fungicide resistance in these pathogen samples have begun at North Dakota State University – Fargo.

Accomplishments:

Objective 1. Evaluate cultivars of diverse chickpea seed types for susceptibility to Ascochyta. Disease ratings of the small kabulis and the desi entries were significantly lower than those of the large kabulis, while the smaller-seeded cultivars tended to be superior to the large kabulis in yield and test weight. Comparing the combination of yield and disease score, B90 again stands out in these data. Due to the exceptionally cool growing season, the plants in these trials matured very late. Yields were severely compromised by drought in Hettinger and wet fall weather in Carrington.

Objective 2. Compare fungicide treatment programs for efficacy in controlling Ascochyta and enhancing grain yield and quality. All fungicide programs numerically reduced Ascochyta ratings and increased yield compared to the untreated check. At Minot, the programs which included separate applications of a strobilurin and either Bravo or JAU 6476 resulted in the lowest disease scores.

Objective 3. Study the response of cultivars and fungicide programs to varying levels of disease pressure. The relative disease susceptibility and yield of the cultivars tested has been generally consistent across site-years, as has been the response to fungicide program.

Objective 4. Quantify the A. rabiei pathotypes present in the PNW and NGP. During the 2004 growing season, we collected 49 diseased chickpea samples from the Great Plains region (41 samples from North Dakota, four from Montana, two each from South Dakota and Nebraska). We attempted to isolate *Ascochyta rabiei* from three stems from each sample. About 22 isolates of *Ascochyta rabiei* were obtained, purified by using single spores and identified. About 10 isolates have been tested in pathogenicity and all identified to be pathotype II. Also about 80 isolates of Ascochyta rabiei were obtained from diseased chickpea samples collected from the western states (California, Idaho, Oregon and Washington). About 30 isolates were tested for pathogenicity and identified to be pathotype II.

Objective 5. Evaluate PNW and NGP A. rabiei isolates to determine the potential for reduced sensitivity / resistance to fungicide. Subsamples of the diseased chickpea plants being tested for pathotypes are entering testing at North Dakota State University – Fargo to determine if the pathogen is developing resistance to fungicides. This component of the project will be the thesis subject of a graduate student who began her degree program in August.

Objective 6. Disseminate results to appropriate user groups. The information generated by this project has been and will continue to be presented at field days and at meetings for growers and the scientific community.

Projections:

This information can be used by growers in selecting appropriate cultivars and fungicide control programs to maximize profit and by technical support personnel in developing recommendations for growers. Researchers may use the cultivar comparison in selecting breeding parents for North Dakota growing conditions.

Proposed future research includes a continuation of the studies on fungicide resistance and pathotyping. Evaluation of cultivars x fungicides will shift to sequences of fungicide treatments (alternating chemistries) and new large kabuli varieties.

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