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Previous studies have shown improved performance of fungicide control of Fusarium head blight (FHB) by recommending that fungicide applicators angle spray nozzles to spray the side of the grain spike, apply fungicide with specific spray volumes (5 to 10 GPA) and maximizing deposition with a specific drop size range ('large' fine to 'small' medium). Further enhancement of fungicide efficacy may be possible if distribution of fungicide on the grain spike can be improved to deposit less of the fungicide on the awns and more on the lemma, palea and glumes of the barley and wheat spike. Studies in 2007 will evaluate air stream delivery systems as a tool to enhance fungicide performance for control of FHB. The objective will be achieved by evaluations on 'Tradition' barley and 'Knudson' hard red spring wheat. 'Tradition' barley is a malt type barley and 'Knudson' HRSW is a moderately susceptible to FHB that has good yield potential with good foliar disease tolerance. 'Tradition' was produced on 26.5% of the barley acres in North Dakota in 2006 and 'Knudson' ranked 7<sup>th</sup> in planted acreage at 374,800 acres. Knudson is susceptible to FHB but has good tolerance to leaf diseases increasing the probability that measured differences are correlated to reduction in FHB. A study designed as randomized complete block and arranged as a factorial with replication will examine three different air stream speeds (maximum, minimum and median range of the sprayer), orifice angles of 30, 60 and 78 degrees downward from horizontal and nozzles that produce 'large' fine, medium, and coarse drop sizes to achieve maximum fungicide deposition and efficacy on small grains for control of FHB. ASAE standard S-572 identifies drop volume at 0.5 for fine, medium, and course as ranges of 183-280, 281-429, and 430-531, respectively. The sprayer is a plot size sprayer equipped with an air assist boom provided by Spray Air Ltd. The boom has been modified to allow adjustment of the air orifices forward from vertical to research boom configurations that may improve fungicide efficacy. The evaluation will be made with Prosaro fungicide (421 SC 3.57 lb/gal. formulation of prothioconazole/tebuconazole, 19% +19% w/w, manufactured by Bayer Crop Science). Assessments will be made by visually assessing FHB incidence and field severity on 20 heads per plot and by determining yield, test weight, deoxynivalenol concentration, protein and barley plump. Deposition differences among the spray system configurations will be assessed by adding a dye (FD &C blue #1 44 gram/acre) to the spray solution, extracting the dye from the 10 spike sample with 80 ml of 90% ethyl alcohol using a wrist action shaker, and assessing deposition using a Jenway photo spectrometer. Statistical analysis of data will be by Analysis of Variance with means comparison using Fishers protected LSD.