PULSE CROP TOLERANCE TO PYROXASULFONE. Ryan L. Hunt and Richard K. Zollinger, Graduate Research Assistant and Professor Department of Plant Sciences, North Dakota State University, Fargo, ND 58108-6050.

Field experiments were established in 2008 and repeated in 2009 to evaluate the tolerance of pea, lentil, navy bean, and pinto bean to pyroxasulfone. Pea and lentil trials were located near Williston, Minot, and Carrington, ND. Navy and pinto bean trials were located near Prosper, Hatton, and Thompson, ND. All trials contained pyroxasulfone applied preemergence (PRE) at 84, 125, 166, and 332 g ai/ha. Pea showed no visual injury or significant yield differences at all locations in 2008 and 2009. Lentil showed no visual injury or significant yield differences at all locations in 2008 and at Williston and Carrington in 2009. Minimal rainfall at the beginning of the growing season at these locations likely resulted in insufficient activation of the herbicide, as evidenced by inadequate weed control. Minot lentil showed 2-15% visual injury 14 days after emergence (DAE), 4-21% 28 DAE, and 0-8% 56 DAE in 2009. This injury did not significantly affect yield of lentil. Navy bean injury 14 DAE in 2008 was 18-96%, 0-28%, and 1-46%, at Prosper, Hatton, and Thompson. 28 DAE navy bean injury was 6-93%, 0-30%, and 0-23% at Prosper, Hatton, and Thompson. 56 DAE navy bean injury was 2-99%, 0-19%, and 0-21% at Prosper, Hatton, and Thompson. Yield at Hatton and Thompson significantly decreased as rate of pyroxasulfone increased. Prosper was unable to be harvested due to weather conditions. Navy bean injury 14 DAE in 2009 was 0-20%, 0-33%, and 0-14% at Prosper, Hatton, and Thompson. 28 DAE navy bean injury was 0-8%, 0-12%, and 0-38% at Prosper, Hatton, and Thompson. 56 DAE navy bean injury was 0-1%, 0-9%, and 0-19% at Prosper, Hatton, and Thompson. Yield at Prosper and Thompson significantly decreased as pyroxasulfone rate increased, but did not significantly change at Hatton. Pinto bean injury 14 DAE in 2008 was 1-35%, 0-12%, and 0-9% at Prosper, Hatton, and Thompson. 28 DAE pinto bean injury was 2-75%, 0-9%, and 0-8% at Prosper, Hatton, and Thompson. 56 DAE pinto bean injury was 0-39%, 0-11%, and 0-4% at Prosper, Hatton, and Thompson. Yield at Hatton significantly decreased as pyroxasulfone rate increased; however, Thompson did not significantly change and Prosper was unable to be harvested due to weather conditions. Pinto bean injury 14 DAE in 2009 was 0-21% and 0-3% at Hatton and Thompson. 28 DAE pinto bean injury was 0-11% and 0-14% at Hatton and Thompson. 56 DAE pinto bean injury was 0-6% and 0-4% at Hatton and Thompson. No visual injury was observed at any rating for Prosper pinto bean. Yields were not significantly different for pinto bean at all locations in 2009. Injury values for both navy and pinto beans were higher in 2008 compared to 2009. An activating rainfall occurred in 2008 while the beans were at the cracking stage, in 2009 this did not occur until the beans were well established. Pea and lentil tolerance to pyroxasulfone was acceptable; however, dry bean tolerance was insufficient.

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