POLLEN-MEDIATED GENE FLOW AMONG WINTER WHEAT CULTIVARS AND FROM WHEAT TO JOINTED GOATGRASS IN THE PACIFIC NORTHWEST. Bradley D. Hanson[1], Carol A. Mallory-Smith[2*], Robert S. Zemetra[3], Donald C. Thill[3], and Bahman Shafii[3], [1]Research Agronomist, USDA-ARS, Parlier, CA 93648; [2] Professor, Oregon State University, Corvallis, OR 97331; and [3] Professor, University of Idaho, Moscow, ID 83844.

The introduction and commercialization of novel genetically modified (GM) and non-GM crop genotypes has raised concerns about the ecological and economic consequences of unintended gene flow among populations. Field experiments were conducted in Idaho, Oregon, and Washington from 2000 to 2003 to determine the frequency and distance of pollen-mediated gene flow among winter wheat cultivars and from wheat to jointed goatgrass using a Nelder wheel design. Outcrossing among wheat cultivars occurred at all five locations with a maximum distance of 42.1 m from the pollen source although only 2.4% of all wheat samples had any hybrid seed. While the maximum contamination in any wheat sample was 0.45%, most had less than 0.1% hybrid seed. Gene flow from imidazolinone-resistant wheat to jointed goatgrass occurred at two of three locations with a maximum distance of 40.2 m. Altogether, 20 imazamox-resistant F1 hybrids were identified and the maximum amount of resistant seeds in a sample was 0.52%. Wheat pollinated both other wheat cultivars and jointed goatgrass at low, but potentially significant amounts in all but one of eight site-years as far as 42.1 m from the pollen source. The biological and economical significance of pollen-mediated gene flow observed in these experiments will depend upon grain purity requirements and the selective advantage of the trait of interest to jointed goatgrass.

2005 North Central Weed Science Society Proceedings 60:118.