INTER-SPECIFIC GENE FLOW IN CANOLA. Suzanne I. Warwick, Research Scientist, Agriculture and Agri-Food Canada (AAFC), Ottawa, ON K1A OC6.

Canola (*Brassica napus*) is capable of genetic exchange with related *Brassica* crop species as well as with several wild relatives. The large-scale use of herbicide-resistant (HR) canola has allowed us to examine inter-specific gene flow on realistic field scales. The HR trait is easy to monitor, provides accurate assessments, and is highly suited for extensive screening programs. Recent studies documenting gene flow distances of up to 200m between HR canola fields and Polish canola (*Brassica rapa*) and oriental mustard *(Brassica juncea*) fields will be presented. *Brassica napus* can potentially hybridize with four related weedy species in Canada and the United States (bird rape, *Brassica rapa*; wild radish, *Raphanus raphanistrum*; dog mustard, *Erucastrum gallicum*, and wild mustard *Sinapis arvensis*). Interspecific gene flow results with these four species will be reviewed, and will include the first report of the persistence and apparent introgression of an HR transgene from canola into the gene pool of *B. rapa*, monitored under natural commercial field conditions. Subsequent studies in eastern Canada confirm that hybridization is frequent throughout the sympatric ranges of these two species. Additional canola-quality *Brassica* crops (*B. juncea*, *B. carinata*) are under development, and interspecific gene flow concerns for these species will be reviewed and recent data from *Sinapis arvensis* x *B. juncea* hybridization studies presented. Consequences of hybridization and introgression are dependent on the traits that are introduced and their effect on hybrid fitness. The results from recent fitness trials for herbicide resistant (HR) and insect resistant Bt weed-crop hybrids (*B. rapa* x *B. napus*), suggest a cost to hybridization, independent of the transgenic trait. Future research needs will be outlined including a need for empirical data on: ecological effects of fitness-enhancing traits such as stress-tolerances, the consequences of transgene spread to non-agricultural habitats (now largely undocumented), and what specific environmental risks transgenic hybrid weed populations pose under field conditions.

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