POLLEN-MEDIATED GENE FLOW IN CANOLA. Hugh J. Beckie and Linda M. Hall, Plant Scientist, Agriculture and Agri-Food Canada, Saskatoon, SK S7N 0X2 and Research Scientist/Adjunct Professor, Alberta Agriculture and Food, University of Alberta, Edmonton, AB T6G 2P5.

Outcrossing in canola or oilseed rape (*Brassica napus* L.) is highly variable, averaging 30%. The crop is partially pollinated by insects, particularly honey bees and bumble bees, but is also known to release large amounts of air-borne pollen. There is consensus that insects can be important contributors to short-distance pollination; in addition, bees and other insects such as pollen beetles can also contribute to long-distance pollen movement. However, the relative importance of wind vs. insects in long-distance gene flow in canola is uncertain. Coexistence among transgenic and non-transgenic cropping systems and identity preservation at the field level are increasingly important issues in many countries. Different types of pollen-mediated transgene flow models for canola have been released during the past decade primarily as a decision-support tool to achieve the European Union (EU) 0.9% transgenic labeling threshold for adventitious presence (AP) of authorized transgenes in food and feed. Many empirical models simulate gene flow well, although their utility is usually restricted by datasets with limited environmental variability or spatial scale. Development of predictive mechanistic models and simulation of transgene flow via insects and wind across agroecosystem landscapes are still in their infancy, although recent progress is promising. Experimental and modeling outcrossing studies reveal that no isolation distance is required between transgenic pollen donor and non-transgenic (conventional) receptor fields of realistic size to meet the EU threshold if AP from other sources (e.g., volunteers, admixture) is minimal. Because seed loss and volunteerism are common in canola, however, transgene flow via seed, not pollen, may be a greater source of AP.

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