GENE FLOW OF IMIDAZOLINONE RESISTANCE FROM CULTIVATED SUNFLOWER TO WILD RELATIVES. Rafael Massinga* and Kassim Al-Khatib, Research Associate and Associate Professor, Department of Agronomy, Kansas State University. Manhattan, KS 66506.

Field experiments were conducted to determine the rate of gene flow from the cultivated Imidazolinone (IMI)-resistant cultivated sunflower to two wild relative species: *Helianthus annuus* and *H. petiolaris* in two locations near Manhattan, Kansas in 2000. The wild species were established in greenhouse. At four to six leaf stages, seedlings were transplanted into concentric circles at distances of 2.5, 5, 15 and 30 m, surrounding a 10 m diameter circle planted with IMI-resistant cultivated sunflower. Harvested seed of *H. annuus* and *H. petiolaris* species was planted separately in the greenhouse. At two to four leaf stage plants were treated with 40 g ha $^{-1}$ of Imazamox to screen for herbicide resistance. Imazamox resistance was estimated 14 days after treatment by counting the number of plants that survived herbicide treatment. IMI-resistance was detected in both *H. petiolaris* and *H. annuus* 30 m from the source. However, IMI- resistance was higher in *H. petiolaris* than in *H. annuus*. In addition, resistance decreased with distance from source and was significantly affected by the predominant wind direction. These results indicate that the IMI-resistant cultivated sunflower can out cross with wild species and that can increase the possibility of IMI-resistance spread to susceptible populations.