

GROWTH AND FITNESS OF COMMON SUNFLOWER AND PRAIRIE SUNFLOWER AS AFFECTED BY IMIDAZOLINONE RESISTANT GENE(S). Rafael A. Massinga and Kassim Al-Khatib. Department of Agronomy, Kansas State University , Manhattan, KS 66502.

Field studies were conducted under greenhouse and field conditions to evaluate the growth and fitness of progeny of domesticated imidazolinone (IMI)-resistant sunflower x wild sunflower species. Under greenhouse conditions, common sunflower (*Helianthus annuus*) and prairie sunflower (*H. petiolaris*) were grown in individual pots. Photosynthesis, leaf area and total dry weight were measured 10, 20, 30, 40, 50 and 60 days after planting. In addition, progeny of domesticated IMI-resistant sunflower x wild sunflower species, were grown in the greenhouse and treated at 2 to 4 leaf stage with 40 g ai ha⁻¹ of imazamox, to determine presence of imidazolinone resistance. Plants that survived imazamox treatment (IMI-resistant) were allowed to grow in greenhouse, and at 6 leaf stage were transplanted to field. IMI-resistant and IMI-susceptible of common and prairie sunflower plants were established in field as replacement series with 10:0, 7:3, 5:7, 3:7 and 0:10 R:S (resistant : susceptible) mixture rates. Days to flower, plant height and 100 seed weight were determined for resistant and susceptible plants at each combination. IMI-resistant and IMI-susceptible common and prairie sunflower plants did not differ in photosynthesis rate, leaf area and dry weight. IMI-susceptible common sunflower growing under no competition was taller than IMI-resistant plants whereas, under competition plant height was greater in IMI-resistant plants. IMI-resistant prairie sunflower was taller than the IMI-susceptible plants under competition and no competition. In general, IMI-resistant plants flowered earlier than the IMI-susceptible plants, but the flowering period overlapped considerably suggesting that the IMI-resistant and wild susceptible plants are likely to hybridize. No differences were observed in number of heads per plant and 100 seed weight between IMI-resistant and IMI-susceptible plants for both common and prairie sunflower. The results of this study did not show any competitive advantage of the IMI-resistant sunflowers over the susceptible the plants.