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Molecular Effects of Insect Herbivory in Multiple Herbicide Resistant Avena fatua

This project is a continuation of ongoing research done by the Dyer lab showing that multiple herbicide resistant (MHR) *Avena fatua* (wild oat) plants express elevated levels of volatile monoterpenes which are implicated in disease and pest resistance. I investigated whether the expression of selected genes in MHR (*A. fatua*) in response to insect herbivory and mechanical wounding differed from herbicide susceptible (HS) plants. Plants at Zadok 35 growth stage were subjected to mechanical or biological injury from beet armyworm (*Spodoptera exigua*) feeding. Plants were harvested 6 h after injury and leaf area damage quantified. To gain insight into differential gene expression, genes known to be upregulated in response to biotic and herbicide stress were quantified using qPCR: GSTF1-GST phi, UDPGlu5-UDP-glucosyltransferase, ABC2-ABC transporter C subfamily, OAT1-Ornithine aminotransferase, RPP1-NBS-LRR (RPP13- like), SNF3-SNF2 ATPase, and Antho1-Anthocyanin bHLH-Myc transcription factor. qPCR results were normalized against two validated reference genes with stable expression. The results will allow us to gain insights into the relationship between MHR and plant defense against biotic stressors.