Developing Non-food Grade *Brassica* Biofuel Feedstock Cultivars with High Yield, Oil Content, and Oil Quality that are Suitable for Low Input Production Dryland Systems.

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Non-food *Brassica* crops have potential to produce non-food oil feedstocks suitable for biofuel production. Developing oilseed *Brassica* cultivars with higher seed and oil yield, high oil quality, and blackleg resistance and grown with low input costs will reduce importation, help break our fossil fuels dependence, and increase national security. In this project we will (1) Develop superior non-food grade oilseed cultivars suitable for a range of PNW and other US environments with blackleg and abiotic stress resistance suitable for high-quality biofuel feedstocks; (2) Dissect genetic architecture of industrial *Brassica* oilseed germplasm for yield, quality, and resistance to blackleg fungus through a genome-wide association study with high-density genetic markers; (3) Develop and apply marker-assisted genomic selection techniques for blackleg resistance that will accelerate development of disease resistant oilseed cultivars; and (4) Use bioinformatics to identify putative PRR resistance genes that confer durable resistance to blackleg and use transgenic approaches to introgress PRR genes into adapted cultivar background. This project will utilize germplasm and the long-term industrial oilseed breeding program at the UI and the agronomy and molecular biology expertise from the UI and WSU. The genetically superior *Brassica* non-food grade oilseed cultivars developed will drastically increase domestic industrial oilseed production. In addition, we will identify new and novel plant resistance genes for blackleg resistance and molecular marker assisted selection tools to accelerate plant breeding procedures. Increased domestic production of biofuel feedstock oil will reduce dependence and importation of fossil fuels, increase fuel security, and ensure US agricultural competitiveness with foreign countries.