



William Rice, 2021 Integrated Plant Systems – Undergraduate Research Experience

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Abstract: Pennycress (*Thlaspi arvense* L.) is a winter annual oilseed crop that is currently being domesticated for commercialization. Pennycress is intended for integration into a corn-soybean crop rotation to provide continuous living cover during months of high rainfall. This will provide a host of ecosystem services such as erosion control, pollinator habitat, and reduction in nitrate leaching. Pennycress seed can be crushed for oil and marketed as a biofuel. A damaging pest in soybean systems is soybean cyst nematode (SCN, *Heterodera glycines* Ichinohe). Pennycress, in greenhouse studies, is a known alternative host to SCN. If pennycress increases SCN population density in the field, that could have negative implications for following the pennycress harvest with planting of soybean, creating a “green bridge” for the pest. The biological mechanisms of SCN development are not well understood in a winter annual cropping system. Root exudates are chemical compounds secreted by roots into the rhizosphere that are detectable by nematodes. These compounds help the nematodes find their host plant and signal hatching. Root exudates were collected from pennycress and three other crop treatments. The objectives of this study were to: i.) quantify SCN infection in pennycress roots, ii.) test the role of root exudates in SCN attraction, and iii.) determine the effect of root exudates on SCN egg hatch. The results from this study will assist in determining if root exudates play a role in SCN attraction to pennycress roots.