



Quantifying the Decomposition of Pennycress

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As pennycress approaches commercialization, quantification of the ecosystem services it provides will help in quantifying its environmental benefits relative to other cover crops. When cover crops are harvested or terminated, the remaining residues decompose and release nutrients back into the soil and are available to subsequent crops. The timing and magnitude of nutrient release could reduce the amount of added fertilizer that are applied to fields. Nutrient leaching from agricultural fields may then be reduced. A decomposition experiment was conducted to calculate the rate of decomposition by measuring biomass and nitrogen loss over time of wild-type pennycress, gene-edited AOP2 pennycress relative to cereal and annual rye. Mesh bags with residue of each species of biomass were placed in two common soil types of McLean County, Illinois (N=5 per soil type) between rows of corn and left to decompose. Samples were collected every 7 days initially and intervals increased over time as decomposition rates slowed. Percent loss of biomass and nitrogen was estimated relative to time 0 samples. Initial findings indicate that decomposition rates were fastest for annual rye followed by cereal rye, wild-type pennycress and AOP2 pennycress decomposed the slowest. This experiment will allow recommendations to be made for future decomposition studies that include multiple agricultural regions and elite lines of pennycress to learn in greater detail how pennycress will function upon commercialization.