Multi-Species Cover Crop Mixtures in the Northern Great Plains

Where precipitation is limited, a fallow season can be used to store water for a following crop. Because cover crops can provide soil health benefits, multi-species cover crops have been promoted as a replacement for fallow systems.

In an article recently published in Agronomy Journal, researchers used relative Land Equivalent Ratio (LER) to show that mixed-species did not always outyield single-species cover crops but were more consistent in total biomass production. Grass and taproot species usually provided greater biomass than legumes, but cover crop consumption left less available nitrate and stored water for a following crop compared with fallow. Relative LER may provide a useful criterion for cover crop mixture construction.

Including cover crops in production systems usually results in improved soil quality, but the short-term negative impact to profit in the semi-arid environment of the Northern Great Plains may limit wide-scale adoption. Building soil quality in this environment will be a marathon, not a 100-m dash. Identifying cover crops with stable and acceptable biomass yield that conserve moisture and nitrogen for the following cash crop is more important than maximizing biomass production in a dryland cropping system.


Seeds for mixed cover crop treatments prepared for planting. Photo courtesy of K. McVay.