

What's the Effectiveness of Cover Crop Cocktails?

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A multispecies cover crop planted after wheat. This farm participated in the Union County Conservation District's Ag Planning and Soil Health Program.

Union County Conservation District

ROCK SPRINGS, Pa. — Cover crops are beneficial, but can they be even more so when combined?

Penn State researchers discussed cover crop “cocktails” and their effects as part of this week’s Ag Progress Days programming.

“One of the big things we’ve been looking at is what can farmers get from cover crop types, and what happens when you combine them,” Brosi Bradley, a research technician, said during the panel discussion on Wednesday.

With legume, peas and clovers, you can get nitrogen benefits for your crops, Bradley said.



Asked about timing for planting, she said as a research farm they try to stick to October.

“We have noticed that things are kind of blooming a lot quicker,” Bradley said.

One of the experiments, conducted by Jennifer Harris, measured the impact cover crops had on microbes in soil.

“Those really matter because they’re very involved in functions that we really care about,” Harris said, “so that could be building the carbon in the soil as well as fixing nitrogen for the cover crop as well as next season’s crops.”

The team tested microbial activity and microbial community composition of different cover crops including triticale, canola, clover monocultures and mixtures. What they found is that canola monocultures led to lower soil microbial activity.

That can be both good and bad, Harris said. It could mean that pathogens are being suppressed; however, it might also lead to fewer helpful microbes and therefore have a negative impact.

“So the next step in this project is to really uncover what microbes are being suppressed by canola,” Harris said, “to enhance the microbial functions that can really help farmers.”

Another experiment focused on the potential of using cover crops to maximize weed seed mortality. The effort, as discussed by master’s degree student Kara Eckert, buried mesh bags filled with seeds of giant foxtail and powell amaranth in different cover crop mixtures and monocultures.

“We buried them in October, when our cover crops are planted,” Eckert said, “and then we take them out at six months, in about May, and that’s when the cover crops are terminated.”

After one year of data, Eckert said, canola treatment significantly affected the giant foxtail’s viability in contrast to the fallow or clover treatment. It did not, however, have an effect on the powell amaranth.

“We’ve been looking at what happens when you combine those and if you can get different benefits maximized,” Bradley said.

But there’s still more research to be done. Another experiment examined how rhizobium leguminosarum, which fixes nitrogen from the atmosphere, changes over time.

“Is that microbe getting better at fixing nitrogen,” Harris said, “or is it maybe losing some functions?”