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Soil moisture impacts

Using a demonstration table, Stockton examined the result of 0.6 inches of rainfall on various soil types and levels of soil cover.

"We have a no-till soil that has about 30 percent cover from barley stubble," described Stockton. "There wasn't any runoff, and some of the moisture

was captured in the soil."

Sandy soil with no cover resulted in almost no infiltration and a lot of runoff. Stockton also noted that the runoff was not clean and filled with soil particles. He continued that the soil type is very prone to wind and water erosion.

"We also have creek bottom soil," said Stock-

ton. "The pieces that look like clods are actually soil peds being held together by the glue the microbes give out to hold soil particles together."

In the soil, there was no runoff and at least two inches of infiltration.

"The soil structure is open enough that water can get through the soil," said Stockton, also noting that there was no soil cover on the sample. "Residue is not absolutely necessary when soil structure is very good."

Another soil sample, a sandy, gravelly soil with 70 percent residue cover, also showed high levels of infiltration. Stockton explained that the air space between the soil particles allows water to flow into the subsoil levels.

"The silt loam soil sample with 100 percent residue cover shows some infiltration and no runoff," added Stockton. "The rest of the moisture is still being held in the soil."

Solving erosion

To enhance water infiltration and prevent water runoff, Stockton noted that cover crops can be planted.

"This cover crop is a nine-way mix of species that was put together in Nebraska," explained Stockton of the research project. Included in the mix

are Canada vetch, cowpea and an Austrian winter pea. Additionally, a brown midrib grain corn, headless sorghum-sudangrass hybrid, nitro radish, purple top turnip, sunflower and safflower complete the mix.

"The legumes introduce nitrogen," explained Stockton. "The radish and turnip help to open up the soil structure, and the safflower and sunflower can root five to nine feet deep in a single season to get water and nutrients back up to circulation."

He added, "The whole idea of a cover crop is to generate soil organic matter to improve soils."

Soil organic matter holds soil particles together, increases capacity and adds nutrient content to the soil, he continued.

"It is critical that we figure out how to get some kind of soil structure back in our soils," he added.

Utilizing cover crops

Ideally, cover crops are grown, then simply rolled down, and the next crop in the rotation is planted directly into the cover.

As a result, farmers see many benefits, including decreased use of herbicides and decreased incidence of disease.

Producers utilizing cover crops found that they don't utilize herbicides as often because

"It is critical that we figure out how to get some kind of soil structure back in our soils." — Roger Stockton, Natural Resources Conservation Service

ground cover inhibits weed growth.

"There are no weeds that will be capable of growing through the mat of vegetation and no evaporation through it," Stockton said.

At the same time, cover cropping may also solve disease problems.

"In southern Colorado, they used to utilize a two crop rotation, but the nematodes were ruining their potatoes," explained Stockton. "They needed a third crop to lengthen the rotation."

By planting the cover crop, producers lengthen the time between crops and also provided feed for cattle. At the end of the season, the cover crops are swathed into windrows where cattle graze during the winter.

"There is also enough of a length in rotation that allows the potatoes to work," said Stockton. "For producers with disease problems in beets and beans, a cover crop in the rotation may help."

Economic incentives

However, before any practice is adopted, Stockton noted that there must be economic benefits. "There has to be an

economic trail or farmers aren't going to utilize it," he said. "We will do some testing this fall and next spring to look at nutrient content of our soil and determine if benefits are present."

Stockton speculates that significant amounts of nitrogen will be added to the soil by the legumes, which provides positive economic impacts by reducing the need for fertilizers.

At the same time, Stockton provided the example of brothers in Kansas who also harvested sunflowers from their cover crop.

"They were able to harvest 2,000 pounds of sunflowers," he said. "They also had ground cover."

"It is a matter of looking for the niches in production to provide economic leverage for producers to start thinking about," Stockton commented. "If they work at cover cropping successfully and adjust it to their fields, I think producers can make it work."

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Soil health — Natural Resources Conservation Service State Agronomist Roger Stockton explained that cover crops add nutrients to the soil, help improve soil structure, increase organic matter, prevent erosion by wind and water and increase water infiltration. Saige Albert photo