2010 Corn Season
Strip-Till vs. Full Width Tillage Study
Irrigation Erosion is Decreased Dramatically

Along the Front Range of Colorado – A 2010 Short Term Study by Colorado State University

The scientists at CSU joined hands with the second season of looking at conventional full width tillage compared to strip-tillage in continuous corn under a furrow irrigation practice. The results are quite eye opening for some folks, for those of us in the Conservation Tillage camp – we exclaim, Yeah! The graph (Fig. 2) below gives a snapshot of two irrigations in August 2010 what was occurring with runoff at the lower end of the field that was 1100 feet in length. The bars depict the amount of siltation (sand+silt+clay) collected in an Imhoff cone in grams per liter after a certain number of hours allowed to settle.

Fig. 1 Image of Imhoff Cones used to determine water quality and sediment loading

At the agronomic research center north of Fort Collins, Colorado, the scientists from Colorado State University sampled the runoff two times in August 2010. As you can see from the chart that water running off the area of the field that was in a strip-tillage environment lost 3.6X less total sediment compared to the conventional tilled portion at the first time of measurements and 2.75X less sediment the second set of measurements.

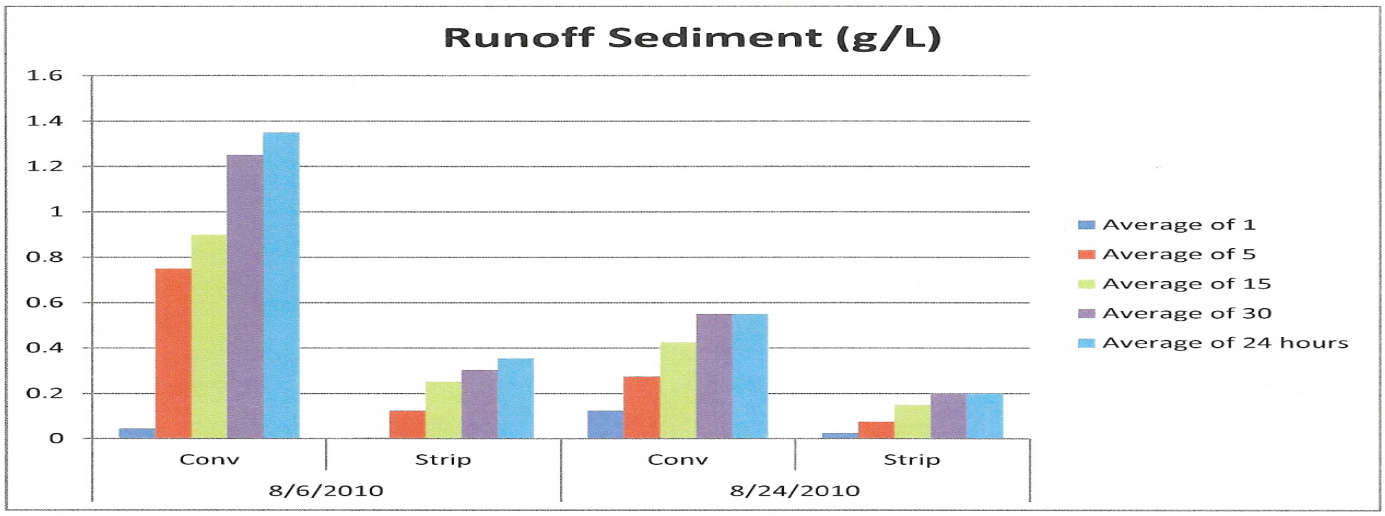

Fig. 2 Differences in Runoff Sediment loads near Ft.Collins, CO, furrow irrigated corn under two tillage systems – Conventionally tilled and Strip-Tilled

Remarks:

Several items come to mind as one looks over this window in time set of data, especially after 37 years of working with soils with USDA and now with Orthman Manufacturing, Inc: 1) water quality that is impacted over 3X due to a better way to manage soils to decrease sediment loading into streams is great news, 2) it is evident that the soil sediment is settling out in the furrows before it reaches the lower end of the field and runs off, 3) with less runoff there is less nutrient loading to streams which causes algae blooms, lowered oxygen levels in water can result due to sediment/nutrients, fishery kills and etc.

Less sediment can also mean that water soaked into the soil profile better to provide water to the intended target – the corn crop. The residues from the prior crop help trap soil sediments in the field to slow down erosive forces from the flow (measured in gallons per minute) that run down each furrow, which is very good.

The first conservation effects of strip-tillage are to reduce wind and water erosion from natural events (rainfall and windstorms). Secondly, strip-tillage reduces fuel consumption to till the soil for planting (energy savings). Time required to prepare the seedbed is reduced. Loss of soil water to evaporation each time the soil is stirred or turned is reduced with the strip-tillage practice since only 28-30% of the soil surface is disturbed compared to 100% in conventional full-width tillage. Losses due to carbon losses to the atmosphere is reduced by 60-75% with strip-till and solid research has demonstrated that repeatedly by USDA-ARS researchers in Morris, Minnesota over the past 15 years. Less nitrous oxide is lost with this strip-tillage system to the atmosphere which is a Greenhouse gas and concerned a problem for our Ozone layer and other issues.

Strip-tillage has affected much more than just sediment folks. All of the growers I have met want to do the right thing with their soil resources and water resources. When we can have quality and positive effects to the tune of what strip-till accomplishes; it is this writer's heartfelt conviction – in furrow irrigated agriculture, we are making the right choice for all the right reasons with strip-till. I think you will agree.

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