No-till On The Plains

KANSAS SOYBEAN COMMISSION

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Using Cover Crops for Resistant Weed Control in Soybeans

No-till on the Plains, in cooperation with the Kansas Soybean Commission, conducted field level demonstrations showing the effectiveness of cover crops to reduce the total number of herbicide resistant weeds. Weed suppression utilizing cover crops can reduce the density (number of emerged weeds) and the size of those weeds (biomass). In crop year 2017 four participating

Soybeans emerging in cereal rye cover crop

producers left "control" areas in their fields where no cover crops were planted ahead of soybeans.

The rest of the field had either single species or two species cover crops planted ahead of soybeans. Herbicide applications were consistent across both treatments. The four sites used for the demonstrations were located in Clay, Osage, Rice and Wilson counties. The sites in Clay and Osage counties also had the demonstrations in 2016. Weed collections and identifications were performed by Dr. Anita Dillie from Kansas State University. Collections were made in the control areas and representative areas for the rest of field. Ten random areas were surveyed in each treatment, transects were 30' long, running down a planted row. All weeds within one foot either side of the row were counted and identified. The average of the ten transects was used to produce a single count estimate. Biomass collections were also gathered at each site.

The cooperators provided their costs of soybean production utilizing the cover crops in lieu of multiple applications of herbicides. They also provide soybean yields in the demonstration fields. Results are listed in the tables below.

Six species cover crop used in 2016

Table 1

Total Weed Counts Cover Crop vs. Bare Check Strip

Site	Cover Crop 2016	Weed Counts #/m²	
		Cover Crop	Check
Clay Co.	6-way blend	1	14
Osage Co.	Oat/pea	76	142
	2017		
		Cover Crop	Check
Clay Co.	Winter Wheat	112	108
Osage Co.	Oat/pea	51	84
Wilson Co.	Red Clover	16	18

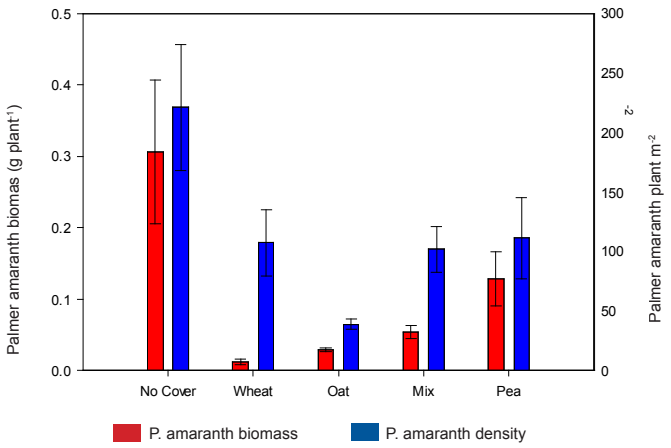
Table 2

Input Costs for 2017 Crop Year

	Clay Co.	Osage Co.	Rice Co.	Wilson Co.
Cover Crop Seed	$4.50	$7.00	$7.75	$5.00*
Herbicicde - pre	$19.97	$30.00	$21.75	$11.00
Herbicide - post	$10.14	$12.00	$13.75	
Labor/Equip	$18.00	$16.00	$18.00	$18.00
Other			$10.00	
Total	$52.61	$65.00	$71.00	$34.00
Yield (avg)**	41 bu/ac	48 bu/ac	40 bu/ac	37 bu/ac

** 3 tons/acre of hay harvested*
*** no significant difference in yield in cover cropped area*

Figure 1



K-STATE Research and Extension

In this 2-year demonstration, cover cropped portions of the fields did control emergent weeds slightly better than the check strip areas. The cover crops had greater control in the 2016 samples than the 2017 samples, Table 1. Cereals seemed to do the best job of weed suppression compared to other single or two species covers. The six species cover crop used in 2016 had the best suppression of the observed covers. Data collected by Kansas State University in 2015 showed any type of cover crop employed suppressed resistant Palmer amaranth better than no cover crop, Figure 1.

Check strip on Osage county field

Economic data provided by the cooperators showed an inexpensive cover crop like oats, winter wheat or red clover can have an economic benefit over multiple post emergent applications of herbicides, Table 2.

Left: Figure 1 - Palmer amaranth biomass and density prior to cover crop termination, May 18, 2015