SNF AGRICULTURE

AERIAL APPLICATION OF POLYACRYLAMIDE ON MISSISSIPPI DELTA FARMLAND

CASE STUDY

BACKGROUND

For decades, farmers and policy makers have taken steps toward reducing the amount of soil and fertilizers draining from agricultural fields into watersheds. Within the Mississippi River Basin, this run-off is thought to create hypoxia, or oxygen deficiency, in parts of the Gulf of Mexico.

The loss of soil, fertilizers, and pesticides have negative environmental impacts on the crop fields and surrounding or downstream bodies of water. As a result, the Mississippi River Basin is designated as one of eight Critical Conservation Areas by the U.S. Department of Agriculture (USDA). This designation allows the USDA, along with producer-driven groups like Delta Farmers Advocating Resource Management (Delta FARM) and the agriculture industry as a whole to work together to implement activities to mitigate soil and nutrient losses across the region.

SITUATION

SNF advocates the implementation of USDA/Natural Resources Conservation Service's (USDA/NRCS) Conservation Practice Code 450, which outlines specific, sanctioned PAM application criteria. So, over the last few years, Delta FARM has conducted various trials using polyacrylamide (PAM) to increase soil porosity and water infiltration, while reducing soil erosion and nutrient run-off. Of particular interest, however, was the possibility of treating large fields rapidly and efficiently with PAM via aerial application.

SOLUTION

In 2015, a large-scale PAM aerial application trial took place on select 40-acre, agricultural tracts in Bolivar, Coahoma, Washington, and Yazoo counties of Mississippi using SNF FLOBOND™ A30 powder-grade polymer. Each 40-acre tract was divided into a 20-acre Control and 20-acre Treated fields. FLOBOND™ A30 was aerially applied to the Treated fields, just after planting, at a rate of 8-10 lb./acre. Four weeks later, a follow-up application of emulsion-grade PAM, SNF FLOBOND™ EC, was applied through irrigation to three of the four Treated fields. All fields were planted with soybeans, except Coahoma County, which was planted with sorghum.

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RESULTS: RUN-OFF DATA

Following the applied polymer treatments to all four Treated fields, run-off water was analyzed after the first significant rain event occurred. Results showed an average 40% reduction in run-off (eroded soil) turbidity. The results shown below in Table 1 display the differences in amounts of Total Suspended Solids (TSS), Total Insoluble Phosphate (TIP), Total Nitrates (TN), and Turbidity (NTU) for each of the four test sites between the Control and Treated. Run-off water analysis results were not available from the Coahoma County test site.

Bolivar County

	TSS	TIP	TN	NTU
Control	448	2.1	19	639
Treated	63	0.6	11	154
% Change	86%	71%	43%	76%

Yazoo County

	TSS	TIP	TN	NTU
Control	639	4.5	5.8	1295
Treated	346	3.5	4.6	949
% Change	46%	22%	21%	27%

Washington County

	TSS	TIP	TN	NTU
Control	638	1.3	2.0	968
Treated	690	1.5	1.9	813
% Change	-8%	-16%	6%	16%

Avg. % Change	41%	25%	23%	40%

TABLE 1

RESULTS: YIELD DATA

The Yazoo County Treated test site produced an increase in uniformity as well as an average increase of 8 bushels of soybeans versus the Control.

The Coahoma County Treated test site had an overall increase of 18 bushels of grain sorghum versus the Control field.

CONCLUSION

By applying PAM after planting, when the soil is most susceptible to erosion, topsoil and applied products can be preserved, with anticipated yield increases seen during harvest.

Producers may also be able to take advantage of cost-sharing of the product through USDA/NRCS Practice Standard 450.