

Evaluating the performance of vegetated treatment areas

Informal Progress Report

August 2005

Miner and McCook Co sites

The VTA inflow monitoring instruments (flumes and samplers) have been operated through the growing season. Weather (air temp, relative humidity, and rainfall) instruments are also in place. We will use solar radiation and wind data from the nearest AES stations- Brookings, Centerville, and Dell Rapids.

The sediment basins have operated well so far. One basin has already been cleaned of solids to restore its storage capacity.

There are some peripheral issues that we are addressing at each site. One issue at both locations is the potential benefit of spreading the runoff laterally across the VTA. As constructed, runoff wastewater has been directed via pre-existing channels at both locations. Spreading the water laterally will greatly increase the vegetative treatment area without increasing the length of either VTA.

Roberts Co site

A preliminary site design is completed, meetings with the owner have taken place, and the design is currently being adjusted. Ken Taylor, NRCS, did the design and met with the owner. In a separate meeting, Trooien, Pohl, and Sara Smith met with the owner.

Because of the topography and proximity to a waterway, there may be more management involved at this site. The design specifies a pump to move the effluent upward in the landscape then distributed via gated pipe to a vegetated area. The owner would also like a large sediment basin so it can be used in some ways as a holding pond and the water can be managed in a limited way as irrigation water.

Meade Co site

Construction has started as of late July. The design was completed by Steve Quissell, NRCS, Rapid City. We plan to have VTA inflow monitoring in place to sample spring runoff events in 2006.

Haakon Co site

A small sediment basin is already in place. The basin will be enlarged if needed and facilities will be constructed to conduct the effluent to a vegetated area nearby. A topographic survey of the area is complete and Sara Smith is working on the site design. This site will handle runoff with two separate vegetated areas due to the topography of the feedlot, although monitoring for this project will take place in only one of the vegetated areas.

Microbiology (coliforms) research

Initial testing showed much reduction of coliforms across the VTA at Miner Co site but minimal reduction at McCook Co site. We do not have mass flow rates to correspond to

the coliform counts but the coliform counts indicate that further treatment of the runoff within the VTA would be advantageous. Lateral spreading would assist with this further treatment of the runoff. Graduate student Martine Zamy is working with Dr Bruce Bleakley to address this objective.

Grass production and management research

This research is being led by Dr Arvid Boe and Martine Zamy. Plots for harvest management research have been established at the Miner site. A good stand of smooth brome is prevalent at the Miner site. The grass at the McCook site is dominated by quack. A summary of the harvests thus far in 2005 is presented in Table 1.

Table 1. Summary of VTA dry matter yields in July and August 2005.

<i>Site</i>	<i>Date of harvest</i>	Dry matter yield, tons/acre
Miner	July 1	3.1
Miner	August 1	0.4
McCook Control Area	August 1	0.8
McCook VTA	August 1	1.8

Plans for the three remaining sites will include biomass and nutrient removal, as outlined in the proposal. In addition, a harvest management study has been added to the project and additional funding (\$20k) has been obtained.

Simulation model research

Sara is learning the simulation models and has started collecting the input data that she will require. In the next few weeks, she will be making any necessary adjustments and beginning to make simulation runs to explore model performance for South Dakota conditions.

Web site

A web site has been developed for this project. It is: <http://abe.sdstate.edu/vts>. We will use the web site to publicize events, post images, post notes from previous meetings and agenda for future meetings, post project updates such as this one, provide information about the sites and VTS's, etc. We will continue to correspond via email when appropriate but expect that attachments, meeting notes, images, etc. will be available via the web site.

Other issues

Dennis Clarke, DENR, has obtained Threatened and Endangered Species clearance on all sites.

The grant from the state Conservation Commission has been secured, thanks to the Miner SCD. They are the sponsors of the grant and its activities. These grant funds will be used to cost-share construction at the Haakon Co site.