



discovery farms update

with Dennis Frame

Local Sampler Training Has Been Successful

Discovery Farms has been busy this summer, working to get research plans developed

and/or implemented on our four core farms, the Bragger Family Dairy Farm, Independence; the Breneman Dairy, Rio; the Heisner Family Organic Dairy, Mineral Point; and E&L Harrison Enterprises, Elk Mound. We've collected nearly a year's worth of baseline surface water data from the Bragger Farm and have groundwater monitoring stations installed at the Breneman Farm. Extensive soil sampling has taken place on all four farms.

To refresh everyone's memory, Discovery Farms is a program of UW-Madison and UW-Extension, and a branch of the Wisconsin Agriculture Stewardship Initiative (WASI). Discovery Farms works with privately owned farms to identify effective and economical best management practices (BMPs) to minimize farming's impact on the environment and create sound, science-based environmental regulations for agriculture.

One major accomplishment for the summer was the recent completion of our first Trained Local Sampler (TLS) program. The TLS program works with people locat-

ed in proximity to our Discovery Farms, teaching them how to take water samples and several other measurements that help determine stream health. The training is imperative to ensure the samples and measurements are scientifically viable and accurate.

Kristine Stepenuck, the water action volunteers coordinator for Volunteer Stream Monitoring through UW-Extension's Environmental Resources Center, organized and put on the two-day training.

Discovery Farms has established three tiers of surface water monitoring, which offer varying levels of monitoring intensity and monitoring expense. Tier 3 surface water monitoring involves the TLS program. Tier 3 water monitoring goals are for the sampling to contribute to the knowledge of the water resource, while engaging and educating nearby producers and consumers. The information gained from this water sampling helps create a picture of water quality within each Discovery Farm's watershed.

Sampling protocols the TLS group learned included:

- Dissolved oxygen – Depending on temperature, average dissolved oxygen should be 7 to 9 ppm. Both aquatic plants and animals depend on dissolved oxygen

for survival. Measuring dissolved oxygen is one of the most significant water quality tests to determine a stream's suitability for fish or other organisms.

- Temperature – The average groundwater temperature is 50 degrees. Temperature changes can affect all aquatic life. Warm water holds less dissolved oxygen than cold water, and triggers higher plant growth and respiration rates.

- Turbidity – Turbidity is a measurement of water clarity, and should average less than 10 NTU (Nephelometric Turbidity Units). Water clarity is one of the most obvious measures of water quality. Turbidity can be a useful indicator of runoff from construction sites, fields, logging activity, industrial discharges and other sources.

- pH – pH is a measure of the intensity of the acidic or basic character of a solution at a given temperature, and should average 6 to 8. pH affects ammonia toxicity, nutrient uptake and heavy metal toxicity.

- Alkalinity – Alkalinity is a measure of the capacity of water or any solution to neutralize acids. Alkalinity should average 100 to 120 ppm, and affects water's pH and fish health.

- Nitrate – Nitrates are an essential nutrient for plant growth and are a main ingredient in fertilizers. Rain can wash

nitrates from farm fields, lawns, golf courses, or other fertilized lands into streams. Too much nitrate can cause problems, such as excessive algal and plant growth. Concentrations of nitrate-nitrogen greater than 90 milligrams per liter can be directly harmful to many aquatic animals.

- Conductivity – Conductivity is the ability of a solution to carry an electrical current. Conductivity should be less than 500 ppm salts, and affects fish health, plant growth, nutrient and toxin solubility, and coagulation of particles.

- Stream flow – Stream flow or discharge is the volume of water moving past a cross-section of a stream over a set period of time. It's usually measured in cubic feet per second. Stream flow is affected by the amount of water within a watershed, increasing with rainstorms or snowmelt, and decreasing during dry periods. Flow is also important because it defines the shape, size and course of the stream. Stream flow is integral to water quality and habitat. Food sources, spawning areas and migration paths of fish and other wildlife are all affected and defined by stream flow and velocity.

- Biotic Index – Biotic index evaluates the types of aquatic macroinvertebrates

See Discovery Farms, on Page 7

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