# Back to School

## Lessons learned by combining BMP theory and hands-on training

***By Carl Menconi***

The idea for Club Mud was hatched after a classroom training for county maintenance workers. As the county engineer thanked speakers for their presentation, he said, "It's just too bad there isn't a class where these guys could actually install these products."

Two months later, the engineer's staff members were invited to a county gravel pit, where they divided into teams and got to work installing erosion and sediment control best management practices (BMPs). When everything was in place, they pulled up the water truck and began the "storm"—about a month's worth of rainfall in 15 minutes.

Next came the debrief: Which products survived the deluge, and which failed? Which installation details made a difference in performance? How did the combination of product, water, soil and topography combine to produce a good or bad outcome, and how can one use that information to assist BMP selection and installation in the real world?

Eight years and 230 sessions later, Club Mud is part of the Associated General Contractors Education Foundation's Certified Erosion and Sediment Control Lead (CESCL) course: the Washington Department of Ecology's CESCL program. The state construction storm water permit requires each permittee to have a CESCL on board to conduct weekly inspections and maintain project storm water records. The department's training specification for CESCLs requires a day in the classroom and a day of field training.

Club Mud's home is Cedar Grove Compost in Maple Valley, near Seattle. Compost is a valuable part of the curriculum. Steve Scott of Applied Organics uses his blower truck to install a compost blanket and berm, and he fills two socks that later will be tested with other BMPs. They move on to Session 1 – Sediment Control: silt fence in four configurations, a straw wattle, a compost sock and a Gator Guard (a wattle-like product constructed of a fabric tube filled with chunks of closed-cell foam). For Session 2, the teams lay down straw and excelsior blankets, jute and coir nets, and plastic.

Club Mud allows industry professionals to apply classroom training in the field.

### Textbook Cases

All installations are "textbook," following specifications from the Washington State Stormwater Management Manual. When the teams have finished their installations, the rainstorm begins, watering each erosion BMP until water flows from the downslope end and filling each sediment BMP to capacity. A perimeter of lightweight fabric silt fence at the bottom of the slope catches whatever escapes the upslope BMPs.

When the rainstorm is over, the class debriefs: What does one learn from making all of this mess? It is not scientific testing by any means, but there still is a lot to discover, including the following:

- **Mulches are the best product for protecting soil from raindrops.** They present a complex surface to intercept rainfall and fit tightly to the ground, obstructing and

absorbing water as it flows through. But as the slope steepens and/or concentrated flows of water pass through, they can begin to fail.

- **Compost is a high performer in all of its configurations.** The class often pours more than 1 in. of water (measured with a gauge) on the compost blanket before it sees any flow over or through it. The blanket will withstand higher flows and steeper slopes than other mulches. Compost socks and berms seal well to the ground, capturing water and preventing underscour.
- **Rolled erosion products perform best when the surface is smooth and staples are installed at specified intervals.** When the class pulls up a blanket after testing, it is revealing to observe sediment staining at each point with good ground contact and rilling where there is not.
- **Straw wattles often fail through underscour, and they are difficult to seal to the ground.** Gator Guards, with a fabric flap buried upslope of the product that guides water into it, overcome this flaw and have a higher success rate.
- **If silt fence must be installed on a slope, configuring it as separate 'Js' or with sandbag check dams captures water and sediment and prevents scouring the silt fence anchor flap.** They also capture sediment and infiltrate water, reducing the load on the bottom-of-the-slope perimeter protection.

## Takeaways

The following four general lessons are learned from the day's activities:

1. **The key to success for erosion control BMPs is good ground contact.** Mulches perform so well because 100% contact is automatic. Ensuring good contact with rolled products can be challenging, but it is key to good performance.
2. **Sediment control BMPs must be anchored to the ground so that water may not flow under them.** Silt fence and Gator Guards have in common a buried flap that accomplishes this. Straw wattles depend on entrenchment and staking, and performance can vary depending on soils and care of installation. Compost in a sock or berm is dense and conforms well to the soil surface, sealing well with minimum installation effort.
3. **Specifications count.** If properly buried, even the lightweight silt fence can hold water to the top—if the posts do not fail, which they often do because they are undersized and too far apart.

Attention to detail during an installation will yield the ultimate measure of performance from any BMP.

A savvy team can ensure success by adding a few posts, bringing the installation closer to compliance with Stormwater Management Manual standards. Many BMPs on worksites are not "textbook" installations and work fine. But under extreme conditions, attention to details of installation will extract the ultimate measure of performance from any BMP.

4. **Microtopography is important.** We know that water flows downhill, but imperfections in the surface—small ridges left behind while grading, for example—can deflect water and produce unexpected consequences.

Successful use of BMPs requires knowledge of the products available for a particular application, an understanding of the site conditions and installation that takes into account all of the variables in play: the product itself, the amount and patterns of rainfall/runoff expected over its lifespan, soils and topography. Products often are treated in advertising and specifications as stand-alone entities, but more often they are part of a system of site factors and the other BMPs in place, and they must be installed as such to succeed. SWS

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