

# CLEARING UP MYSTERIES WILL AID GROWTH OF HYDRAULIC SEEDING

By Bruce F. Shank, Editor



**Bowie pull-behind unit** in hose operation. The unit requires one person to control the clutch and another to operate the hose.

Manufacturers of hydraulic seeding and mulching products appear to be mounting another charge at growth as reclamation regulations sweeten the market. Even though reclamation is not proving to be the boom market as hoped, other markets such as lawn care are keeping interest high and bringing needed attention to specifications and mulches.

Highway construction and the Army Corps of Engineers have provided the hydraulic mulch and seed manufacturers with their business mainstay since the forties when the first hydraulic seeders and straw blowers were introduced commercially. For the past decade there have been three makers of equipment (Bowie, Finn and Reinco) and two national distributors of mulch (Weyerhaeuser and Conwed). These five firms have been and still are the foundation of the market.

But their market is being challenged on both equipment and mulch fronts. Strong Manufacturing of Arkansas and Electric Technology of Washington have released hydraulic seeding devices this past year.

New companies selling mulch on a national scale have come chiefly from the cellulose insulation business. They include Cellin of Virginia, International United Chemical Co. of Los Angeles, and Fibrex Corp. of Kansas City. Strong Manufacturing is planning to enter the mulch market this summer with a paper mulch.

There are others who have existed on a more regional basis. They include Superior and Grass Growers in New Jersey, Grass Fiber Inc. and Jacklin in the Northwest, Cal-Fiber in Los Angeles, and Fibre-Therm in Ontario, Canada. There are many others who convert urban byproducts into mulches for the area around them.

Organizations such as the International Erosion Control Association (IECA), The Associated Landscape Contractors of America ALCA, and the Soil Conservation Society are putting more emphasis on hydraulic seeding and mulching in their programs. Their members are raising questions about basic problems with state and private specifications, application rates, application methods, and products.

These questions should be answered before the market gets so confused and uncertain that architects will exclude hydraulic mulching from specifications and revert to blown straw.

Getting answers means objective research is needed. At the present time there are only two or three persons active in university research of hydraulic mulches and equipment in the U.S., Burgess Kay at the University of California, Davis, and R.E. Blaser at Virginia Polytechnic Institute, Blacksburg. Their research has been limited in many cases to small plots and sometimes artificial environments designed to resemble real conditions.

Bob Fischbach, secretary treasurer of the IECA,

told Weeds Trees & Turf that the Association has now enough funds to start supporting research. Hopefully other gifts to research can help these researchers develop programs large enough to make field test comparisons of all products currently on the market. Industry associations, armed with this objective data, can police promotion of industry products for accuracy.

#### Products

Most of the suspicion is over mulches. The equipment manufacturers naturally feel their equipment has advantages over their competition. But for the most part, they have all been doing a good job when properly used.

Mulches on the other hand are used in great volume. Consistent grind and quality are important when used in hydraulic seeders.

According to Blaser, mulches are used to control erosion and dust during construction and to assist establishment of seedlings. They control erosion by preventing rain drops from breaking down soil particles and plugging up pore spaces with small sandy and silty materials. They assist establishment of seedlings by moderating soil temperature and improving water infiltration.

Straw, hay, wood bark, wood chips and wood fiber are the best mulches Blaser says. Kay has reported that in rainfall tests paper performed well on a 1:1 slope and increased the effectiveness of wood fiber in a half and half mix. Other mulches on the market consist of different types of paper, processed straw, and treated byproducts of the seed industry.

Costs, slope, application procedures, location, and additives make any of these mulches best for certain conditions. There is a place for straw, which tends to be cheapest at approximately \$100 per acre, and hydraulic mulches which can cost from \$400 to \$600 per acre.

"When you get into highway cut that is 200 ft. tall and 1½:1 slope, or you get into a housing project where you've got to have immediate ground cover hydromulching shines, Fischbach says. "But if you can get in there with a wheel tractor, drill seed, blow down straw, and crimp it in, hydromulching makes less sense."

One advantage of hydromulching is it can be a one-step process. A slurry of seed, mulch, fertilizer and binder can be applied all at one time. However, at normal application rates of 1,500-3,000 lbs. dry matter per acre, even large tank hydraulic units have to be refilled every 15 minutes.

Another way is to hydroseed with seed and fertilizer, and then blow on straw. On steep or windy slopes a binder might need to be applied over the straw.

Norm Krisburg of Reinco has linked efficiency of one- and two-step methods with the size of the

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## Hydraulic Seeding

job. Krisburg says that once a job gets over four acres, the two-step method is less costly, even though a straw blower is needed in addition to a hydraulic seeder or mulcher. Walter Reinecker of Reinco says, "Invariably, if someone buys a hydrograsser from us and contemplates a full-time mulch business, he will come back and buy a straw blower in two to three years."

Blaser suggests this combination: 3000 lbs. straw per acre blown on and overseeded with a seed, fertilizer and wood fiber slurry at 700 lbs. per acre. The wood fiber binds the straw to the soil and according to Blaser, is superior to any of the binders or tacking agents. He adds that such an application can last through the winter on slopes of 1½:1. This would be the Cadillac and too costly for some projects.

Specified rates characteristically are higher on the West Coast than on the East Coast. "Fiber on the West Coast has nearly always been specified at a ton an acre," says Reinecker. "When fiber was first introduced to the East Coast, specs were set at 700 lbs. per acre. East Coast suppliers wanted to be competitive with hay or straw and fiber mulch cost \$100 more per ton on the East Coast due to shipping costs from the West Coast. The 700 lbs. rate was too low and now most specs range from 1,200 to 1,500

lbs. on the East Coast. They are reaching 3,000 lbs. on the West Coast."

Paper mulches can be produced wherever large amounts of paper are used and therefore aren't as tied to shipping costs. Much of the strategy of the new mulch companies is to eliminate long haul shipping costs by setting up plants in regional centers. This will probably force down mulch prices for a period of time. Single plant companies warn that product quality can vary with regional plants.

Mulches may vary according to additives. You can buy basic mulches and add your own binders, surfactants, and fertilizer, or you can buy premixed versions. Binders do vary and this is one area where some research could help. Experts will say that fertilizer content should depend upon soil tests. Fibrex contains something called a "growth stimulant," but a spokesman for the company said the identity of the stimulant is a trade secret.

Larry Porter of Strong Mfg. said his company has tested certain papers for mulch and found the coating on some paper to have the same effect as a binder. Ernest Gilchrist of Cellin reports paper type does make a difference.

Rates seem to be climbing to straw rates, 3000 lbs. per acre. If they reach that level, mulches for

*Continues on page 36*



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hydraulic devices will be about three times more expensive than straw from a local source. Shipping costs are rising at the same time. The advantages of hydraulic mulches will have to be clearly established to overcome the cost differential.

Krisburg has suggested there is a point of diminishing return on mulch and seed rates. The cost of additional mulch may not justify the added germination.

The differences in hydraulic seeders and mulchers center around pumping and mixing.

The oldest device, the Finn, has both mechanical agitation and recirculation to keep the slurry uniformly mixed. The Finn has a centrifugal pump. A recirculation system has the bonus of valving from the hose end. The operator can control spraying from the ground by a valve on a semirigid hose.

The Reinco has recirculation mixing only. It claims this simplifies the machinery and cuts down on maintenance. However, the Reinco uses a larger centrifugal pump.

The Bowie has a gear pump that can handle heavy slurries and can be used for sprigging as well as seeding. Bowie says seed damage is reduced since seed only goes through the pump once. Without recirculation however, hose end control is not possible. Two men are needed when using a hose.

The Strong Spraymate uses a progressive cavity pump, which is a technology from the cement pumping business. Like the Bowie, material passes through only once. Strong says their machine can handle 1:1 water to solids. It can sprig and is reversible in case of nozzle blockage. The slurry is mechanically mixed.

The Erocon Division of Electric Technology Corp. makes hydraulic seeders and a device called an air seeder. The hydraulic seeders range from 800 to 3,300 gallons and have hydraulically driven mechanical agitation systems. The purpose of the hydraulics is to replace drive belts, chains, and

sprockets of standard mechanical agitation systems. There is no recirculation. A diesel engine drives two pumps, one for the agitation system and a centrifugal pump for spraying.

The air pump is a device which combines seed and fertilizer from separate tanks and sprays them out together. The rates of fertilizer and seed can be controlled. The device can spray out 40 ft.

Erocon is also the company that is producing a land imprinter developed by the Forest Service, which imprints reclaimed topsoil to hold water and seed.

### Specifications

When a landscape contractor does business in more than one state, variations in specifications can be a hassle. Highway work specifications are established by the state architect or engineer based to some extent on Federal guidelines. But sometimes you have to wonder why neighboring states have such different specs.

For example, Charles Tennant, chairman of ALCA's Erosion Control Committee, works for both Illinois and Iowa highway departments out of his Rock Island, Illinois office. "Iowa specifications call for 400 gallons of seed and fertilizer slurry per acre, whereas Illinois requires separate applications of seed and fertilizer at 1,000 gallons per acre," says Tennant.

Fischbach says the state architect makes the specifications up based upon his own testing, influence from contractors and influence from suppliers. "Regional climate differences are part of the reason for variance, but not all."

"The contractor always wants to put the least amount of mulch down and the supplier always wants the greatest amount," according to Reinecker.

Lawn Care companies in some regions of the U.S. offer hydraulic liming, seeding, and overseeding as a extra service to customers. Erocon is developing a simplified version of its 800 gallon unit specifically for landscape contractors and lawn care companies.

The reclamation market for surface mines will take longer to develop than originally thought. Lawmaking took considerably longer than expected and enforcement isn't really off the ground in many states. When the questions are resolved and the requirements of the law are made clear, then surface mine reclamation will start to roll. Many coal companies have already established reclamation programs under state law.

Highways, surface mines, and lawn care should provide healthy growth in hydraulic seeding and mulching for the next ten years. The landscape contractor will develop more uses for smaller hydraulic units. A slow-down in the construction industry might soften the effect of lawn construction, but developers may be convinced that hydraulic seeding is a quick and economical way to seed a new subdivision. How hydraulic seeding will compete with sodding is yet to be seen. As in lawn care, a new technology can spell tremendous growth if it works, but it has to work consistently and reliably.

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Reinco unit features simple, jet agitation without mechanical paddle wheels.