

INNOVATIONS IN RIGHT-OF-WAY SEEDING¹

by Robert C. de Wilde

With the great demands for electricity and the construction of large generating stations with their huge demands for coal, strip mining has come into its own. The reclamation of such strip mines and miles of new transmission rights-of-way are important areas of potential for Amchem's new aerial and ground seeding systems. Large tracts of land have already been seeded through our initial Mechanical Research and Development program with the assistance of our 1975 contract applicators, Penn Line Service, Asplundh, Campbell Air Service and Barfly.

The new aerial hydro-seeding system features the *HYDRO-SPYDER*, a twelve nozzle centrifugal device designed for helicopter mounting through which liquid slurries of seed, fertilizer, growth stimulants and a chemical mulch are hydraulically distributed.

Helicopter application is substantially faster than conventional ground methods, enabling seeding of up to 70 acres per day. Early spring seeding on extremely wet soils is now feasible; whereas use of heavy ground equipment would be prohibitive. Most areas and slopes are readily accessible to a helicopter and any size area can be seeded immediately after being restored. Spring applications can generally be made without any soil preparation when typical freeze-thaw conditions prevail. With the *HYDRO-SPYDER*, easy in-flight swath control from 25 to 55 feet enables precise application over all types of right-of-way terrain.

Chemical additives are also an important part of the system's approach to seeding. *HYVETROL*, a polymer, bio-degradable, inert spray additive, is used to suspend the seed and fertilizer in the liquid spray slurry. This thickening additive acts as a form of chemical mulch in that it surrounds the seed, has moisture-holding capabilities and sticking qualities which help secure the seed to the soil, retarding erosion and enhancing germination in hostile environments. Studies show that

HYVETROL is also an excellent carrier of inoculant. Standard recommended rates of inoculants added directly to the legume seed mixture, uniformly coats the seed. Applied through the *HYDRO-SPYDER*, *HYVETROL* seed slurries falling from the spinning disc appear as many quarter size globular spots on the ground, creating the proper microenvironment for germination. *HYVETROL* eliminates the problem of seed segregation; a great improvement over conventional dry seeding methods where seed segregates by weight and wind. Each type and size of seed will appear in each globular spot. Uniform seed distribution results in even germination and rapid ground cover.

In most reclaimed rights-of-way areas, the soil is deficient in nutrients, consequently, a soluble liquid fertilizer starter solution such as 10-20-10 is recommended. The fertilizer utilized is pH neutral and non-corrosive to transmission lines, towers or equipment. In addition to fertilizer, two growth stimulants, *ETHREL* and *ROOTONE* are added to the seed slurry. These growth stimulants speed the rate of germination, insure complete germination and produce vigorous seedlings with sturdy root systems.

Mixing of seed and spray additives for helicopter application is usually done at a staging area using a conventional hydro seeder. The seed slurry is then pumped on board the helicopter using two hoses, one for each saddle tank. A standard recommendation would be to fly 22-25 mph at an altitude of 100 feet with a flow rate of 60 gallons per minute, using a 270 rpm spray disc speed. This would produce a swath width of 50-55 feet, treating 3 acres per minute with 20 gallons of seed slurry per acre. For good coverage without skips, it is recommended that two helicopter seeding passes be made in a basket weave pattern.

Ground hydro-seeding with a conventional fire hose type nozzle and application of water suspended seed is not a new concept. Having been

¹Presented at The International Shade Tree Conference in Detroit, Michigan in 1975.

introduced in the early 50's by the Finn Corporation, hydro-seeding of roadsides, lawns, construction areas and reclamation sites is a multi-million dollar business which is still expanding. What is new? A breakthrough in hydro-seeding technology from Amchem; a ground hydro-seeding system featuring the *HYDRO-SPINNER*. A twin nozzle spinning device used in place of the fire hose nozzle, the *HYDRO-SPINNER* is mounted on a conventional hydraulic seeder to distribute liquid slurries of seed, fertilizer, fiber and *HYPETROL*.

The *HYDRO-SPINNER* provides for substantially faster, easier, more uniform seed application and in as little as 1/3 the time. Uniquely, the swirling spray pattern of the *HYDRO-SPINNER* produces the same swath width on both horizontal and vertical planes, thereby making accurate application to both steep slopes and level terrain while the sprayer and vehicle are moving. The swath width can also be rapidly varied from 15 to 50 feet.

The *HYDRO-SPINNER* system also enables uniform and accurate placement of various types and sizes of seed, even by a newly trained nozzle operator. Because of accurate seed placement and the addition of *HYPETROL* polymer, the *HYDRO-SPINNER* evenly distributes seed slurries with 400 gallons per acre; 1/3 to 1/6 the total spray volume of conventional hydro-seeding. The economics are real; lower spray volume and speedier application with the *HYDRO-SPINNER* system can increase the tra-

ditional capability of a hydro-seeding unit from 500 to as much as 1,500 acres per year. This allows an opportunity for substantial savings per acre as well as increase revenue from each hydraulic seeding unit.

Application of seed, fertilizer, mulch and *HYPETROL* slurries at the optimum ground volume of 400 gallons per acre develops a web-like pattern stabilizing the soil while providing an environment conducive to germination. Seeds are no longer trapped to germinate and die in the large quantities of mulch normally necessary to retard erosion. In addition, it is now possible to eliminate the two-step operation on hydraulically applying seed followed by a separate application of hay or fiber mulching. Although not as meaningful, it is possible to use the *HYDRO-SPINNER* with conventional large volume slurries of up to 3,000 gallons per acre with 1,000 to 1,500 pounds of mulch and increase normal output in terms of gallons per minute applied.

We feel that the *HYDRO-SPINNER* and *HYDRO-SPYDER* seeding systems are dynamic new approaches to revegetation of rights-of-way and other land reclamation areas. Consider these systems for speedy, economic application combined with uniform, accurate placement of various seeds to produce the desired stabilizing vegetative cover.

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ABSTRACT

Shurtleff, M.C. 1975. **The unsightly sooty molds.** *Grounds Maintenance* 10(11):36.

Sooty molds are fungi that form a blackish, often velvety, crustlike coating on the surface of leaves, stems and fruits. Their food is 'honeydew' secreted by sucking insects such as aphids, scales, mealybugs and whiteflies. Sooty molds do not obtain food from the plant itself; hence are not parasites. The superficial, often thick mold commonly grows in blotches and is easily removed by rubbing to reveal healthy plant tissue. If the insect secretion is abundant, the entire leaf, shoot or fruit surface may be covered with a dark membranous coating. Although unsightly, the only damage done by sooty mold fungi is indirect — shutting off light, thus interfering somewhat with photosynthesis and food manufacture.