



Hydroseeding underway.

The Flowers on The Hills of Industry

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IT PROBABLY BEGAN with John Chapman. From the hills of western Pennsylvania through the forests of Ohio and Indiana, “Johnny Appleseed” conjures up the picture of a skinny fellow sowing seeds, left and right, as he walked through the wilderness territories of the early 1800s. Indeed, John Chapman was a seedsman, and he did establish a chain of seedling fruit tree nurseries along the freeways of early western-bent settlers. Today, he wouldn’t recognize the seed business.

The scene now shifts to 1980, to Southern California and Industry Hills. Here a new and different public golf and recreational facility is being developed by The City of Industry, about 20 minutes from downtown Los Angeles. This project has been in the planning and maturing stages for more than a decade. The complex, sprawling over 640 acres, not only will offer 36 holes of public golf, Olympic-size swimming pools, tennis courts, bridle and hiking trails, but also conference and convention facilities for the developing City. In the

years to come, few of us will remember that these wooded, gentle hills were once barren and brown, their canyons filled with garbage and refuse — some over 150 feet deep!

Turning a dump site into a recreational area is not new, but this one is different. It has even been likened to the Taj Mahal; i.e., one of a kind. Representing a \$60 million investment, Industry Hills may well be a precursor of things to come. Since no one is making land any more, more and more marginal land must come into use. The trick, of course,

is to turn a once ugly duckling into Cinderella. That's where hydroseeding (hydromulching) comes onto our scene, and that's why we speak of a new turn in the seed business.

In its beginnings, hydroseeding was used almost exclusively for erosion control, principally along highway rights-of-way, but now it has moved into beautification and landscaping, a means of establishing permanent plant covers for difficult slopes, soils and changing climatic conditions. Selecting plants with wide adaptation capabilities is surely one of the secrets of today's successes in hydroseeding. That such plants are even available, is a tribute to the worldwide plantmen who have made the initial native selections.

Steven Ormenyi, landscape architect for Industry Hills, knew of at least one firm specializing in procurement and preparation of native and/or adaptable plant species for hydroseeding purposes. Mixes may consist of ground covers, small and large shrubs and trees. Ron Pecoff has spent years searching out plant materials adaptable to difficult, adverse conditions. Because early information was meager and little or no research data was available, Pecoff gathered his own information. He had dealt with planting in coastal marshes, in soils dredged from the ocean, steep cuts, landscape fills, and desert plants. He has made a number of native selections and became familiar with their

requirements and peculiarities. The factors of soil types, pH, nutritional needs, rainfall, humidity, slopes and grades, day length and the ability of a seed to establish itself through hydro-mulching techniques are learned best by experience. The ability of a seeded species to compete with native but undesirable plants is a major consideration in plant selection. There are now over 350 species of seeded plants that have proven their worth for hydroseeding. Included are annual flowers, ground covers, shrubs, trees and even ferns for all climates. From cedars, pines and redwoods for the mid-latitudes to Eucalyptus tree species (having two million live seeds per pound) for the sub-tropic and tropic latitudes, new data and new adaptable plants are being added to the success list each year.

To achieve a reasonable stand of hydro-seeded plants, 12.5 million live seeds per acre is recommended. Sounds like a lot of seed? Not really when one considers, for example, that less than two percent of the seeds will survive. Compare this to the 90 percent or more success in greenhouse plantings.

Hydroseeding success is now virtually assured if all planting requirements are met. The largest hydroseeding project currently proposed is the reforestation of 25,000 acres by helicopter in the Sudan. Another 7,000 acres at Jeddah International Airport, Saudi Arabia, is scheduled to be seeded in 1980. Desert

plant species collected from Australia, the American deserts, South America and Saudi Arabia itself will be used. Effluent water will furnish the necessary irrigation.

Hydroseed mixes frequently call for special seeds not commercially available. In such cases, they must be ordered 8 to 12 months in advance. This permits seed collections to be made from stands of native plants wherever they may be.

ONE OF THE MAJOR difficulties in hydroseeding establishment is competition from native weeds. The first step, therefore, is to remove as many of the weed seed producers (mature plants) as possible. Good weed control, prior to hydroseeding is a key to success.

Surprisingly, certain weed seeds such as the tumbleweed require nitrogen for germination. All weed seeds, however, will benefit from fertilization, and, therefore, fertilization becomes the next step in the weed-control plan. A complete fertilizer is generally used.

Natural rainfall or irrigation must then furnish enough water to bring about good germination. A minimum of three weeks is needed and up to two months is necessary sometimes (of course at the right time of the year) to produce the required weed development.

Once a good stand of young weeds is achieved, Diquat or similar type contact weed killer is applied. If grasses are present, Roundup or similar grass her-

Did Johnny Appleseed start it all?



Fiber cover after hydroseeding. Pen points to actual seeds.





bicide must be used. Grasses are a major deterrent to the establishment of other cover crops.

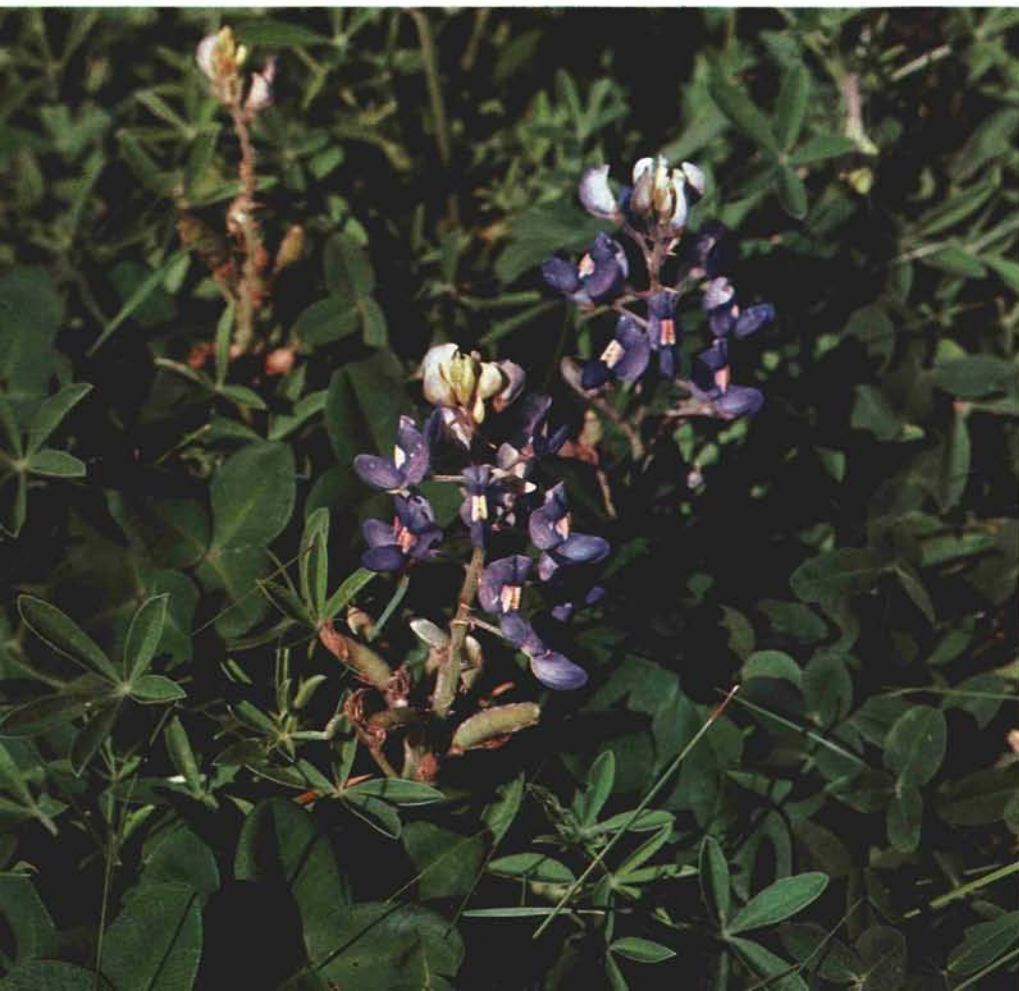
When treating weedy areas with herbicides, professionals recommend vegetable dye in the tank. This tells the applicator where he has been and approximately how much herbicide has been applied to a given area. If the initial weed kill is not completely successful, hand weeding at a later date (after hydroseeding) may become necessary.

WITH WEED COMPETITION knocked out, seeding time is at hand. Recommended seeding rates range from 30 to 60 pounds per acre, depending on the type of plant cover desired. Present techniques also call for a complete fertilizer (such as 14-14-7) to be added to the seed slurry in the hydroseed tank. In addition, enough fiber material (available commercially and artificially colored green) is added to the tank slurry as a carrier for the seed and to show what areas have been covered and how intensely.

Within a day or two following seeding, the balance of fiber must be applied for an average total of 1,800 pounds of fiber per acre. The actual amount of fiber will vary depending on the degree of slope. The addition of glue or some kind of stabilizing emulsion is also frequently added to the tank at this time.

Having destroyed the weeds and applied the seed, fertilizer, fiber and glue, all that remains is assuring a moist fiber until germination. In areas depending on a natural rainfall, proper timing of seeding and the use of a carefully designed seed mixture is very important. Germination is always a critical stage and much of the crop can be lost if things become too dry.

One hundred thirty acres of hydroseeded area were developed at Industry Hills during the last year. An evolution of color and plant growth has followed. At first there were alyssum, lupines, clover, California poppies, daisies, gazanias, and other wild flowers. Within months we began to see the shrubs, pampas grass and seedling trees emerging by the hundreds. It would be seemingly impossible to gain the same results from hand planting and hand seeding. Under



(Top left) The first spring after hydroseeding and some of the results.

(Left) Lupines, clover six months after hydroseeding.

our circumstances at least, hydroseeding has wrought a miracle!

WHAT OF THE COSTS? Figured on a square foot basis, actual seed costs seem almost infinitesimal. They may range from \$.0069 per square foot (\$292 per acre) to \$.011 (\$470 per acre) or more depending on the seed mixture desired. If tree seeds are used, the cost will be inevitably greater. At Industry Hills, eleven different mixes were used; each containing ten or more different plant species. The mixes ranged from a meadow grass and flower mix to a virtual reforestation program. The average seed cost per acre was approximately \$600. Add another \$1,500 per acre for herbicides, fertilizer, fiber and glue for a total materials cost of \$2,100 per acre.

The basic figure per acre for labor and equipment costs is approximately \$2,500. This includes the labor application costs of herbicides, seed and fiber, fertilization, irrigation, hand weeding, etc.

Expensive? Well that depends upon your perspective. When hydroseeded areas produce seedling trees ranging from 8 to 12 feet within 18 months and an attractive ground cover is established on marginal soils and under adverse conditions within a few months, the results justify the expenditure. This is especially true if the area is for public use and early erosion control is essential. Conventional hand installation and planting methods are, in the long run, even more expensive, and it usually takes four to six years to realize similar results.

Hydroseeding may not be for everyone, but each year more and more landscape architects are recognizing its possibilities. The golf course superintendent and golf course architect may want to take note. Difficult soil and difficult landscape problem areas seem to yield to this new technique. Blowing desirable plant seeds in a water and fiber solution from a gun; having them establish themselves, compete and eventually take over an entire area is truly a modern miracle. It is also an accomplished fact. Johnny Appleseed may have started it, but he would never recognize the turn the seed business has taken today.

Typical seedling Eucalyptus and hydroseeded cover.

