

New Products . . .

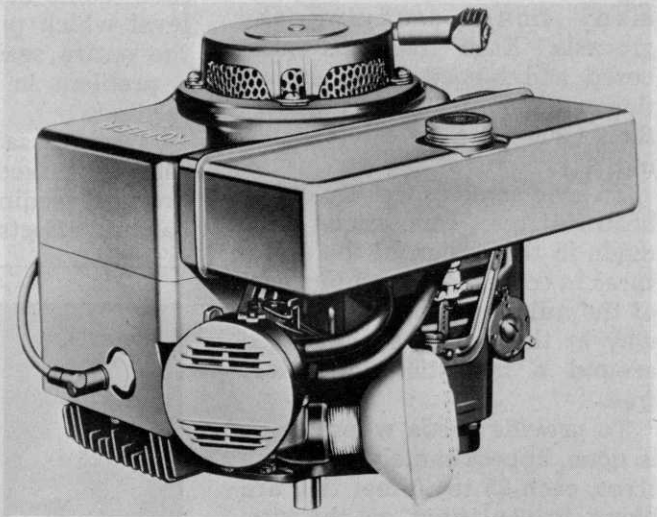
Designed for the Vegetation Care Industry

Viking's Landscaping Roller Blade, a one tool, multi-job, turf building and maintenance tractor attachment, is now available in four model sizes, 7 h.p. to 50 h.p., to fit garden, utility and industrial tractors. One man can build, renovate, or maintain lawns, parks, recreation areas, golf courses, and industrial sites without leaving tractor seat. Viking Roller Blades can be used for scarifying, aerating, leveling, seeding, fertilizing and slicing. Tractor attachment consists of grading blade, spreader hopper and grid roller. The spreader accurately spreads all common types of grass seed and fertilizers. Write: Viking Manufacturing Company, Manhattan, Kan. 66502.



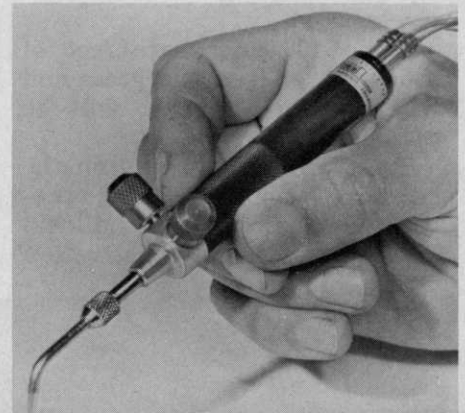
Fully-powered, air-electric Tire-Matic tire changer that handles tube-type as well as tubeless tires. Unit runs on 110 volt AC current, while bead breakers operate on 125 to 150 lbs. of air pressure. Write John Bean Automotive, FMC Corporation, 1305 S. Cedar St., Lansing, Mich. 48910.

Kohler Co., Kohler, Wis., is introducing five vertical shaft engines for 1968. Model KV101 pictured, smallest of the five, is a compact, four-cycle, cast-iron engine which develops its rated 4 h.p. at 3600 rpm. Weight is 42 pounds, and measurements are 12½" by 12½" by 10¼" high. It is equipped with ACR, Kohler's patented automatic compression release for easy starting.



"Little Torch", which welds metal is smaller than .002" wire and up to 16 gauge steel has been developed by Tescom Corp., 2633 S.E. 4th St., Minneapolis, Minn. It uses oxygen and a fuel gas (acetylene, hydrogen, LP-Gas or natural gas) to produce flame temperature to 6300°F. Torch is equipped with five different sized tips which swivel 360° for complete handling ease.

New tilt-deck utility trailer has been announced by the Snow Corp., 4350 McKinley, Omaha, Neb. 68112. Principal design improvements include a "lo-ride" suspension system which decreases deck height; an increase in deck width; and a hydraulically controlled tilt mechanism on the three largest models.



San Antonio's Hemisfair Will Feature Native Trees

When San Antonio's Hemisfair '68 opens to visitors April 6, one of the features will be almost 2000 native specimen trees. Budget for landscaping at this world's fair is \$800,000. Of this, more than \$250,000 will be spent for pruning, planting and caring for trees and ground cover.

The 92.6-acre site of the 1968 world's fair, in the heart of downtown San Antonio, was once a desirable residential area. In later years it had become crowded with one, two and three story homes. Here, too, were nearly 2,000 native trees, including pecan, hackberry, liveoak, elm, lemon, orange and avocado.

Some of the striking old homes will be restored by Hemisfair for use during the fair. Preserving the trees is the job of Robert Copeland, landscape architect for Hemisfair.

Before bulldozers started razing the site, Copeland spent many hours studying the grounds. Each tree was numbered and tagged for preservation or removal. In the end, more than 1,300 trees were left standing.

To save some especially old or beautiful tree, concessions were made in the design of the structures to come. For example, part of the mile-long artificial waterway at the fair was dog-legged around a majestic old 60-foot tree.

To provide shade where there is none, approximately 400 large trees, each 25 to 40 feet tall, are being transplanted on the site. Native oak and elm are being trucked from the "hill country" north of San Antonio. The topsoil here goes down less than three feet before bedrock is reached. Root structure spreads laterally over the rock, making the job of lifting the trees relatively easy.

Some 100,000 square feet of sod, most of it zoysia grass and St. Augustinegrass, will be planted.

Trees already growing on the site have been barricaded to prevent damage by trucks, bulldozers and other heavy construction

equipment. Each tree has been given a value tag, ranging from \$200 to \$2,000, according to size and type. Any contractor who destroys one unnecessarily must pay the fair corporation for a replacement.

Activated Charcoal Helps Nullify Herbicide Residue

Activated charcoal has been used to nullify the harmful effects of herbicide residues on turf. Research at the University of Rhode Island, Kingston, R. I., by John A. Jagschitz shows that this product will absorb the molecules of harmful residues.

Discussing this at the Northeastern Weed Control Conference at New York City last month, Jagschitz pointed out that weed control chemicals used on turf leave a residue in the soil which prevents establishment of new turfgrass from seed. Such residues may last from several weeks to several months, he said. Some herbicides require a level which proves harmful for the entire season. This creates a problem in establishing new seedings.

Jagschitz said that activated charcoal mixed with soil at the time of seeding eliminated the harmful effects of such broadleaf

weed killers as 2,4-D, Banvel D, MCP, Tordon, and Silvex. Successful seedings in the Rhode Island experiments, he said, were also made in soils previously treated with preemergence crabgrass chemicals such as Azak, Bandane, Betasan, Dacthal, and Planavin.

Activated charcoal, a powdery carbon substance, is one of the most efficient adsorbants. It has an extremely large surface area in comparison to its volume.

Siduron was the only chemical used which did not inhibit turfgrass establishment.

Southern Cal Turf Council Elects Officers For 1968

Officers and directors for the Southern California Turfgrass Council were elected at the January membership meeting at Los Angeles, Calif. President for the new year will be Robert Scofield, Robinson Fertilizer Co., and vice-president in charge of programs is Hugh McKay, Moist-O-Matic Division, Pacific Toro Company.

William E. Howlett, Cal-Turf, Inc., was elected vice-president in charge of membership; Paul Adams, City of Burbank, secretary; and Dr. H. Hamilton Williams, Los Angeles State and County Arboretum, treasurer.



Orville G. Bentley, dean of the University of Illinois College of Agriculture, center, looks over the program for the 8th Illinois Turfgrass Conference with 4 of the 200 people who attended. They are, from left: Peter Vandercook, Orland Park; Francis Hinricks, Racine, Wisconsin; Bentley; C. M. Hunt, Keokuk, Iowa; and Wayne Trometer, Orland Park. U. of I. turf specialists reported the latest turf research at the December 7-8 meeting.

Green Valley Turf Company Integrates Both Production and Marketing in 400-Acre Farm

Vince Lombardi, Green Bay Packer football coach, has often been quoted as saying that nice guys can't win. But this certainly is not the case with J. R. "Rusty" Wilkins, manager of the Green Valley Turf Company at Littleton, Colo. He is both nice guy and winner.

A visit to this Rocky Mountain operation will prove the point. Rusty, who is manager and vice-president of the company, has developed a demand market for the more popular varieties of quality sod.

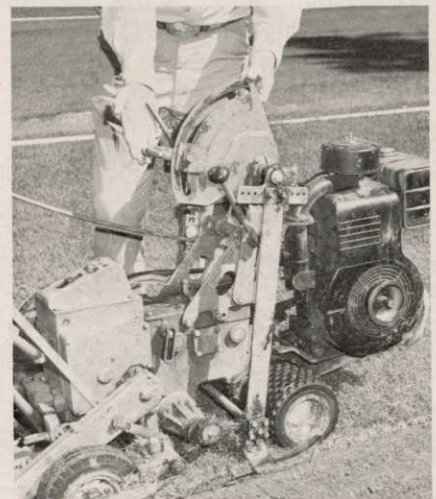
Green Valley specializes in Park, Merion, and Prato blue-grasses. Windsor and several varieties of specialty golf course sods are also grown. Sod sales to an ever-growing clientele include the home lawn, industrial, institutional, military, golf course, and highway department markets. Both wholesale and retail sales are made.

President of the company is K. C. Ensor, a Denver home builder. His need for sod, which prior to 1960 was largely un-



Once sod is palletted, fork lifts are used to quickly load trailer trucks. Loaded trucks are covered with a tarpaulin to protect sod from sun during transport. Tarp also helps hold sod rolls in place on pallets.

available in this area of the nation, led to development of the sod company. Before growing his own sod, Ensor was transporting sod some 700 miles from Iowa growers. Naturally, little was used in the area. Wilkins, son-in-law of Ensor and business graduate of Arizona State University, Tempe, Ariz., joined Ensor in the venture as farm manager and vice-president of the firm. Eddy Lea Ensor, daughter of Ensor, is secretary-



Specialty designed accessory helps maintain stability of cutting depth on cutter. Designed by Rusty Wilkins, it is transferred to new cutters as they are purchased.

treasurer of the firm and serves as office manager. She is responsible for much of the marketing effort of the company.

Past Marketing Experience Helpful In Selling Turf

Miss Ensor, who attended Stephens College, Columbia, Mo., and graduated from the University of Denver, finds sod marketing closely related to marketing and merchandising in other fields. Formerly, she worked as a buyer and in marketing for the Marshall Field Department Store, Chicago.

The Green Valley operation consists of 400 acres of cultivated

Green Valley Turf Company, Denver, Colo., management team: Miss Eddy Lea Ensor, seated, secretary-treasurer; Ken C. Ensor, president, center; and J. R. "Rusty" Wilkins, vice-president.





Turf buggy built from a used Volkswagen is used by Green Valley Turf Company to ride herd on the extensive irrigation system. Buggy can pass over aluminum pipe without damage, and at the same time eliminates compaction of new sod.



Sod is cross stacked on pallets after cutting and hand rolling. Wilkins reports little or no trouble has been experienced in movement of the sod rolls during transport.

sod. Wilkins uses a combination harvesting system. Sod is cut with a Ryan sod cutter, rolled by hand, loaded by hand on pallets, and then loaded on trucks by forklifts. To date, Wilkins has found this the most efficient system for his own particular operation. Labor, while not in great supply, is sufficiently available that he can hire the help needed to roll sod behind the cutter and load the pallets.

Normally, sod is cut and loaded out immediately. Three

laborers are used behind the sod cutter for rolling. They follow this operation by loading pallets. The cutter operator also fills in on loading pallets as he becomes free of the cutting operation. In addition, this man handles one of two forklifts in loading out trucks. During loading, the second forklift is handled by the truck driver.

Once a truck is loaded, the truck driver attaches his forklift to the truck and it is towed to the delivery site and used to

unload the freshly cut sod.

This system, Wilkins reports, makes efficient use of manpower. At the same time, the use of equipment designed to do the job keeps the number of harvesting man hours as low as possible. Right now, Wilkins and Ensor are investigating sod roller harvesting equipment to further reduce the hand labor requirement.

Green Valley sod is marketed in outlying areas as well as metropolitan Denver. Clientele



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South Dakota Certified Kentucky Bluegrass

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Mowing is done twice weekly during summer season. Tony Nickerson, above, runs company's diesel-powered, 7-gang mower. A custom built rotary mower is used to mow under irrigation lines.

ranges from Boulder, Colo., which is 35 miles north, to Pueblo, more than 100 miles south. Mountain areas to the west are also served. To keep sod in as fresh a state as possible during transport, each load is covered tightly with a tarpaulin. This tarp also serves to hold sod rolls which are cross stacked in place on the pallets.

Lag Time From Seeding To Harvest 10-24 Months

New seedings are made after each harvest. Lag time between seeding and harvest ranges from 10 to 24 months, depending on the grass variety and season. Chemical fertilizers are used in combinations which are needed for best plant development. Irrigation at seasonal rates of more than 2 million gallons of water daily is from river bottom wells. Irrigation pipe of 1¼" and 2" sizes are used. Wilkins says the system right now consists of 5500 heads of the 1¼" size on as many pieces of pipe, and 2500 additional heads and 6000 pieces of pipe of the 2" size. Riding herd on this extensive system is aided by use of a "turf buggy", built from a used Volkswagen. Rainbird sprinklers are automatically sequenced by time-control valves.

During summer months, mowing is done twice weekly by a combination of flail mowers. Wilkins uses a diesel-powered 7-gang mower and a custom-built rotary mower. The latter

is equipped with shield over the turbo cones and used to mow under irrigation pipe.

Marketing is an integral phase of the Green Valley operation. Ensor, who has built and sold thousands of homes in the area and is still a progressive builder, has contributed his experience in business management to the operation. Eddy Le Lea Ensor also has previous marketing experience, and Wilkins is a personable and effective salesman. They sell both quality and service. Every purchaser of sod, whether retail or wholesale, is provided with information sheets and folders on care of sod after laying. Instructions for laying sod are also included for the homeowner who may be laying his own sod.

A sales piece which has proved helpful is a simple, 2-page, mimeographed cost comparison sheet. It gives itemized costs of seeding versus sodding. Besides costs, labor needed for each type of lawn is compared. Best sales point for the sodded lawn is the fact that the homeowner has a lawn immediately with sod, and is not faced with the 2- to 3-year time lag needed to develop an attractive lawn.

Outlook for the sod industry is favorable in the view of the Green Valley management team. The Ensors and Wilkins believe that the instant lawn idea will become even more popular and that demand for quality sod will continue to grow.



Ryder-Roller Attachment for

Ryan Sod Cutters Equipped With Auto-Cutoff Units

Now being produced and distributed by Merion Sod Farms, Inc., Utica, Mich.

Priced low at \$795 f.o.b. Utica, Mich.

Attachment is latest and best working sod roller that allows you to cut, mark, and roll the sod in one easy operation as you ride. Adjustments are very simple and machine will work on all types of soil that can be cut with your cutter. (Now includes turning attachment to push sod aside).

Please address all inquiries to:

MERION SOD FARMS, INC.

44533 Sterritt
UTICA, MICHIGAN
Tel. 313+731-2570

We will be in the Ryan Equipment Booth at the 39th International Turfgrass Show in San Francisco, Feb. 18-23. See you there.

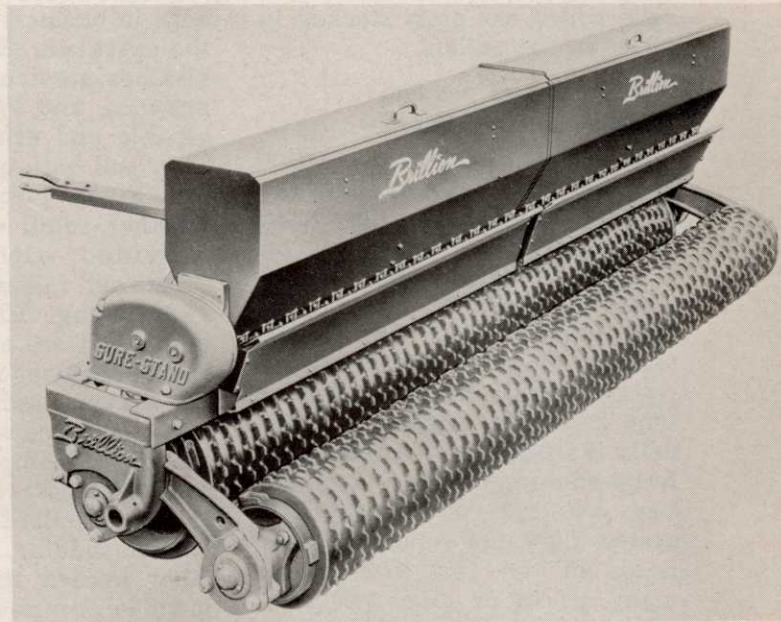
For Sod Producers

Equipment to Fit Your Operation



Nunes sod harvester, above, is being used on Summit Hall Turf Farm, Gaithersburg, Md. Nunes harvester operates with a 3-man crew and can lift, roll, and palletize up to 1200 square yards of sod per hour. Developed at Cal-Turf Farms, Patterson, Calif., the harvester handles any desired length of rolled or slabbed sod. John Nunes, designer of the harvester, reports that the unit will travel at speeds up to 17 mph and will handle conveyor extension for direct truck loading when desired. Nunes harvester permits field grading of sod by operator, who has continuous clear visibility of sod during transport to deck of unit. Harvester travels alongside turf during harvesting and is not affected by moisture conditions. For more information contact: The John Nunes Mechanical Harvesting Co., 2518 Loquat Ave., Patterson, Calif.

New precision grass seeder by Brillion is designed especially for sod and turf growers and for professional landscapers. Turf-Maker combines precision fluted feed rolls and unique micrometer adjustment for accurate seeding of fine grasses and lawn mixtures, with seed savings ranging up to 50%. The Turf-Maker minimizes pre-planting labor and costs. It crushes, seeds and rolls in one operation. Offset notched rollers press down small stones, eliminate air pockets and tuck the accurately metered seed within the top one-half inch of the moisture-trapped seedbed for rapid germination and growth. Notched rollers also bring up moisture from below through capillary action. Exclusive Brillion Micro-Meter adjustment provides an infinite number of settings for precise metering of fine seeds to suit varying job requirements. The Brillion Turf-Maker is available in 8-foot and 10-foot drawbar models, with $6\frac{1}{8}$ -bushel and $7\frac{1}{2}$ -bushel capacity double compartment seed boxes respectively. Options include transport wheels and a 3-point Category II pick-up for the 8-foot seeder. For additional information, write to Brillion Iron Works, Inc., Brillion, Wisconsin 54110.



Specially engineered wide metal wheels are designed and sold by Daymon Manufacturing Corporation. Robert Daymon, manufacturer, is also president and owner of Emerald Valley Turf Nurseries, Gregory, Mich. Emerald Valley is one of the leading sod producing farms in the nation. Wide wheels are built for use on all equipment which travels on new sod fields. Purpose is to roll and level field to prevent tracks or ruts, insuring an even cut when sod is harvested. For information, write: Daymon Manufacturing Corp., Emerald Valley Turf Nurseries, Gregory, Mich.

Princeton Turf Farms is now marketing sod harvester with capacity of about 10,000 square feet of sod per hour. The machine utilizes 3 men. Practical maximum for 10-hour day is 7000 square feet per hour because of physical capacity of men to handle sod and pallets. Pallets carry 1500 to 4000 pounds of sod, depending on moisture conditions of sod when harvested. Princeton unit is complete harvester, cutting sod which is transported to pallet decks. Two men on rear of harvester fold sod and load pallets. Harvester drops loaded pallet to ground without a machine stop. For information, write Princeton Turf Farms, Inc., Box 392, Union Valley Road, Cranbury, N.J.



Ryder-Roller sod rolling attachment is designed to fit Ryan sod cutter. Operator rides while machine cuts, marks off lengths, rolls, and moves sod aside so that it clears machine allowing for return trip. Maker reports that single operator rides seat of a trailer unit, attached by a pin to a clevis type hitch which is mounted by 6 bolts to back of cutter. All bolts fit into existing bolt holes of the Ryan cutter and cutting, drilling or welding is not necessary for installation. New development of the Ryder-Roller is attachment which fits on the front of the cutter and moves the sod rolls to one side on the return row. Attachment swings 180 degrees for operation on either side. Ryder-Roller fits a Ryan machine with 18-inch cut, and auto-cutoff unit C-8, C-9, or later. For information, write: Merion Sod Farms, Inc., 44533 Sterritt, Utica, Mich. 48087.



Fork lifts and pallets for handling and transporting sod are being widely used. This is true for both rolled, flat, and folded sod. Above fork lift is a tractor-mounted unit by Massey-Ferguson. It is in use on Princeton Turf Farms, Cranbury, N. J. General Manager E. C. Tantum says the tractor is very useful for helping move mired sod trucks and equipment in addition to loading pallets.

Daymon sod roller rolls sod in either one or 1½ square yard rolls. Designed at Emerald Valley Turf Nurseries, Gregory, Mich., the unit has been in use for the past 5 years and is being used throughout the U.S. and Canada. Capacity is 2000 yards per hour. Riding unit requires single operator and transports sod rolls to one side to permit return trips. For information, contact: Daymon Manufacturing Corp., Emerald Valley Turf Nurseries, Gregory, Mich.



Meeting Dates



Weed Society of America, 1968 Meeting, Jung Hotel, New Orleans, La., Feb. 5-8.

Maryland Arborists, Nurserymen, and Florists Days, Center of Adult Education, University of Maryland, College Park, Md. A day for each in order listed, Feb. 13, 14 and 15.

Mississippi Aerial Applicators Association, Annual Meeting, Buena Vista Hotel, Biloxi, Miss., Feb. 14-16.

Annual Agricultural Chemical Conference, Oklahoma State University, Student Union, O.S.U., Stillwater, Okla., Feb. 14-15.

National Arborists Association Mid-Winter Meeting, International Inn, Tampa, Fla., Feb. 18-21.

American Sod Producers Association, First Annual Meeting, in conjunction with Golf Course Superintendents Assn. Convention, San Francisco Hilton Hotel, San Francisco, Calif., Feb. 18-23.

Midwest Regional Turf Conference, Purdue Center, Purdue University, Lafayette, Ind., Mar. 4-6.

Maryland Sod Conference, University of Maryland, College Park, Md., Mar. 6.

Massachusetts Fine Turf Conference, White House Inn, Chicopee, Mass., Mar. 6-8.

Midwest Regional Turf Conference, Midwest Regional Turf Foundation, Purdue University, Lafayette, Ind., Mar. 4-6.

Western Agricultural Chemicals Association, Spring Meeting, Hilton Inn, San Diego, Calif., Mar. 11-13.

Western Society of Weed Science, formerly Western Weed Control Conference, Owyhee Hotel, Boise, Idaho, Mar. 19-21.

Michigan Turfgrass Conference, Annual Meeting, Kellogg Center, Michigan State University, East Lansing, Mich., Mar. 20-21.

Northern California Turfgrass Exposition, Northern California Turfgrass Council, Hall of Flowers, Golden Gate Park, San Francisco, Calif., Mar. 20-21.

Turfgrass Grower's Seminar, Annual Meeting, Memorial Union, University of Rhode Island, Kingston, R.I., Mar. 21.

Chipman Chemical Company Merges With Rhodia, Inc.

Chipman Chemical Company, New Brunswick, N. J., has become a division of Rhodia, Inc., N.Y.C. as a result of a merger of the two companies.

Chipman will retain its present management team. Blanchard Smith, general manager of the Chipman Division, has been named a vice-president of Rhodia, Inc., according to R. J. Picard, president of Rhodia. Warren Moyer, former president of Chipman, though of retirement age, will continue as a Rhodia consultant.

National Arborists Stage Winter Meeting At Tampa

Arborists are staging their annual winter meeting this month at the International Inn, Tampa, Fla. Meeting dates are Feb. 17-21, according to Clarke Davis, executive-secretary of the National Arborists Association, Inc.

Committee meetings begin early Saturday, Feb. 17, and the business session will be held Sunday at 9:00 a.m. Registration for members begins at 4:00 p.m. Sunday, Feb. 18.

On the program this year will be discussions on unions, accidents, estate planning, electronic data processing, lightning protection systems, and a revision of constitution and by-laws of the organization. A complete recreation program is planned for wives attending the event.

New Chemical Products Prevent Fertilizer Caking

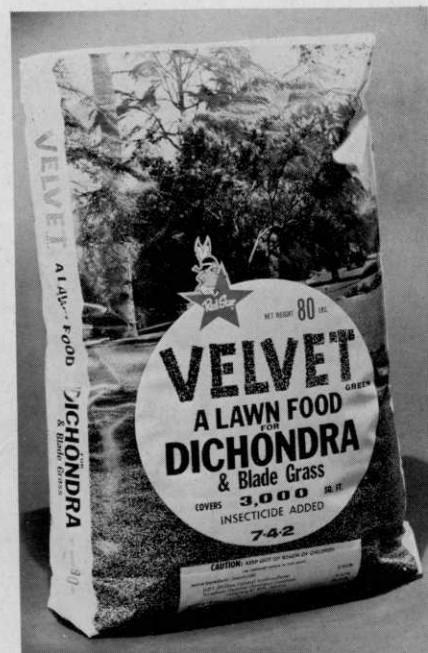
Two new products are now on the market which will prevent fertilizer caking. Both new conditioners are produced by Nopco Chemical Division of Diamond Shamrock Corp.

Known as Sellogen NS 50 and Sellogen NS 96, tiny amounts of either are potent enough to prevent caking in extremely large quantities of fertilizer. As little as ½ pound of Sellogen NS, according to Nopco, will condition a ton of fertilizer.

Sellogen NS 50 is a 50% active liquid for spraying and adding

to fertilizers in solutions. Sellogen NS 96 is a 96% active powder for use in dry blending fertilizer operations.

Sellogen NS may be added directly to mixed fertilizer, ammonium nitrate, superphosphate or urea. Technical data and laboratory samples are available from company headquarters at 60 Park Place, Newark, N.J.



Merit award for square-cornered polyethylene bag engineered by Union Carbide Corporation and presented by The Packaging Institute and its Hardware-Housewares Packaging Committee went to The Downey Fertilizer Co.

Union Carbide Wins Plaudits For Production Of New Fertilizer Bag

Highest award for a shipping bag at the 7th annual Hardware & Housewares Packaging Exposition went to The Downey Fertilizer Co. for its polyethylene shipping bag, which was produced by Union Carbide Corporation, N.Y.C.

Downey Fertilizer uses the bag to market its "Velvet Green" lawn fertilizer. The bag and packaging design were selected over more than 300 entries.

The polyethylene bag is square cornered. Advantages include significant space savings over conventional pillow-type bags plus moisture resistance and burst strength.

New Chemical Approved For Industrial Weed Control

A new industrial weed control chemical is now on the market. It is Casoron G-10, a product of Thompson-Hayward Chemical Company, Kansas City, Mo.

Casoron G-10 is a dichobenil weed and grass killer. It has just recently received clearance by

the U.S. Department of Agriculture. The new chemical provides non-selective control of a broad spectrum of annual and perennial weeds. Thompson-Hayward expects its greatest use to be in industrial areas which are difficult to handle by normal weed eradication methods. Such areas as electric substations, petroleum installations, buildings, railway rights-of-way, fence rows and

similar areas where bare ground control is needed are likely.

Casoron G-10 is a free flowing granule and non-flammable. It should be spread uniformly over the soil surface by hand operated or tractor mounted granule spreader. For non-selective weed control Casoron G-10 should be applied at the rate of 120 to 200 pounds per acre or 4½ to 7½ ounces per 100 square feet. The lower rates may be used if the weed infestation is primarily annuals. For perennial weeds, and in dry areas the higher rates should be used.

Best results will be obtained by applying Casoron G-10 during the coldest weather when perennials are fully dormant. For annuals, application should be made prior to germination or when new plants are very small.

Other formulations of Casoron are widely used for weed control on ornamentals, fruit orchards, citrus groves, cranberries and aquatic herbicides.



Casoron G-10 being applied to control unsightly weeds on railroad spur in company loading area. Note ease of application.



Difficult maintenance problem posed by weeds growing between pipelines and like areas can be solved easily with Casoron G-10.

GET A HEAD START
ON
GROUND MAINTENANCE
with **OREGON GROWN** fine leaf RED
FESCUE

- FINE TEXTURED—Companionable with other grasses.
- DURABLE—Resist heavy traffic.
- WIDELY ADAPTED—More tolerant to adverse conditions.
- PRODUCE DENSE SOD—Inhibits weed growth.
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Information & Sample Packets Available on Request.

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DEERBRUSH

(*Ceanothus integerrimus*)



Drawing from: California Range Brushlands and Browse Plants by Arthur W. Sampson and Beryl S. Jespersen. Calif. Agric. Expt. Sta. — Ext. Ser. Manual 33.

Prepared by: O. A. Leonard, Botanist, Assisted by B. J. McCaskill Senior Herbarium Botanist, Botany Department, University of California, Davis, California

The genus *Ceanothus* contains about 60 species of evergreen and deciduous shrubs and small trees belonging to the family Rhamnaceae. Most members of the genus are native to the Pacific Coast of North America. Some members of the genus are attractive ornamentals. Deerbrush, while not normally used for this purpose, is an attractive shrub.

Deerbrush or sweet birch (*C. integerrimus*) is distributed in the coastal mountains from southern California to Oregon, and in the Sierra Nevada from southern California northward through Oregon to the east side of the Cascades in Washington. It also occurs in Baja California, Arizona, and New Mexico. Other species of *Ceanothus* occur at greater and lower elevations than deerbrush; in fact, some members of the genus can be found in all of the forests, chaparral, and non-desert shrublands of the Pacific Coast.

Deerbrush is a loosely branched deciduous shrub, 3 to 12 feet tall, with green or yellowish, often somewhat drooping, branches. Leaves are alternate, mainly elliptical, 1 to 3 inches long and $\frac{3}{8}$ to $1\frac{1}{2}$ inches wide, usually 3-veined from the base and light green. The flower clusters are mainly compound, $2\frac{1}{2}$ to 6 inches long, with peduncles of about the same length. The flowers are white to deep blue, or sometimes pink, and are quite showy. The fruit is globose to triangular, about $\frac{1}{4}$ inch wide, and contains 3 legume-like seeds.

The ecological development of this plant is favored by fire. Germination of the seed requires heat; this causes the hilum tissues to split, allowing water to enter the seed. Old mature forests may be devoid of deerbrush; however, when such forest lands are burned (usually following logging) deerbrush may develop abundantly. In such instances it appears as though the seed may have remained dormant for as many as 100 years prior to the burn. In addition to promoting seed germination, fire, if not too intense, will not kill deerbrush completely; stem and basal sprouts will form. At the same time, non-sprouting forms of shrubs and trees will be killed; thus deerbrush is ecologically favored.

Although both sprouts and seedlings are relished as browse by deer and livestock, deerbrush does use soil moisture and thus can greatly reduce the survival of planted conifers; further, deerbrush reduces the growth-rate of the young conifers which do survive. An important objection to having dense stands of deerbrush in forests is that they greatly increase the difficulty of controlling fire and damage done to trees when it occurs. Many of these reasons also apply to other species of *Ceanothus* and other brushy plants occurring under similar situations. Problems listed are far more critical in the Mediterranean-like climate, the summers of which are essentially rain-free, of the Pacific Coast than in other parts of the U. S.

Esters of 2,4-D and 2,4,5-T can be used to kill the seedlings or sprouts of deerbrush. Best control is achieved by spraying early in the summer, following a fire of the previous year. Seedlings of other woody plants are also controlled in this manner. In addition, the sprouts of other woody species (including mountain misery, *Chamaebatia foliolosa*, which, although less widespread, is even more adverse than deerbrush to conifer seedling survival) are best controlled by following this approach. Pine seedlings should be planted during the following winter or spring. By so doing, brush competition will be minimized, while at the same time grass, which can be lethal or extremely harmful to young conifers, will not have had sufficient time to invade the areas.

When pine or other conifer seedlings develop abundantly along with deerbrush, spraying should be delayed until late August or early September during the second growing season following the fire. Delay in spraying until after the pines have stopped growing minimizes spray damage to the conifers. 2,4,5-T should be used because it appears to be more selective than is 2,4-D under the conditions described. Pines can also be sprayed well in advance of commencement of growth in the spring as another means of minimizing injury.

By following a proper series of spray applications, one can develop good pine or other types of coniferous forests, and such forests can be less fire-susceptible than were the original forests.