

## Suppliers Personnel Changes

Amchem Products, Inc., recently assigned G. Watson Whiteside as a sales representative for the Lawn and Garden Products Department. He will serve Wisconsin and Illinois.

The Ansul Co. announces appointment of Nick Mechales as sales representative in the Chicago area, and Eldon L. Hyde as agricultural sales representative in the states of Kansas, Missouri, Iowa, Nebraska, the Dakotas, Minnesota, and Wisconsin.

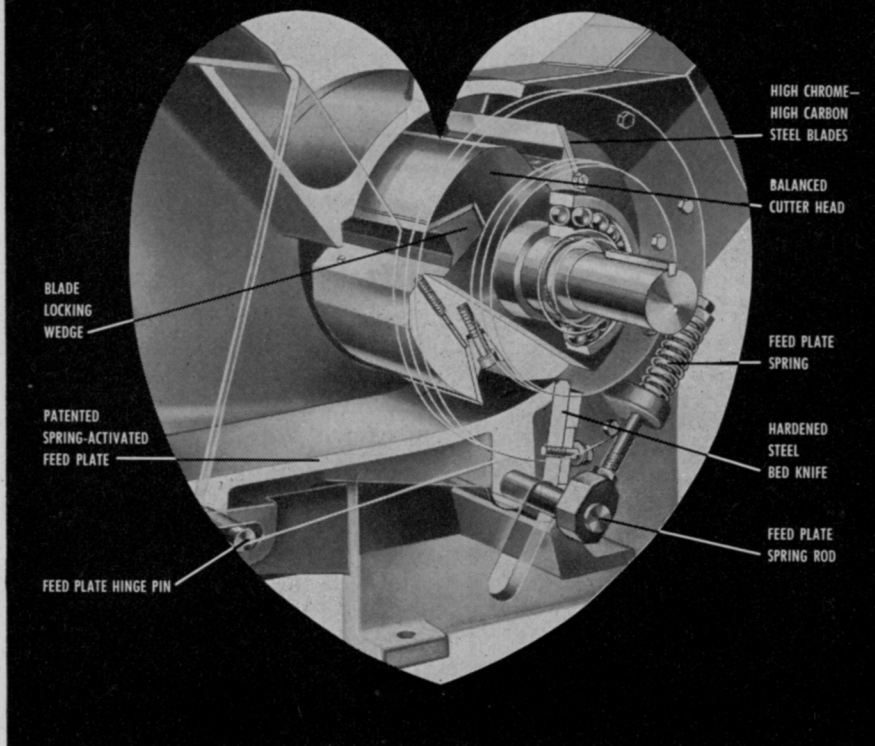
The R. H. Bogle Co., Alexandria, Va., is now headed by Ralph H. Bogle, Jr., son of the founder R. H. Bogle, Sr., who has been made chairman of the board of directors. Others of the family named to posts were John B. Bogle as vice president and secretary, and H. M. Bogle, treasurer.

Chevron Chemical's Ortho Division made these changes recently: Richard W. Goode is now assistant to the manager, western region, garden and home products, with offices at the company's headquarters in San Francisco; Steven T. Carlson has been appointed garden and home sales representative at Los Angeles; Douglas Eugene Pinguely recently joined the firm and is now sales representative for the Cincinnati, Ohio, area; and Keith A. Runge was recently assigned as a sales representative for agricultural chemicals in the Toledo, Ohio, area.

Thompson Mfg. Co. advises that Alan B. Jenkins was recently appointed director of marketing. A former vice president of the Bank of Los Angeles, Jenkins will be responsible for professional and consumer product lines. Thompson manufactures sprinkler and irrigation systems.

Union Carbide Corp. has sent Bruce I. Blackwell to Vienna, Austria, where he assumed duties as assistant regional manager for agricultural chemicals throughout Europe, the Middle East, and Africa. He is working under the direction of F. Gayle Kennedy, Euro-African regional agricultural chemical manager.

## No Other Chipper Has ALL These **FITCHBURG FEATURES**



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## Surfactants, Laborsaving Tools, Business Aids, Noted at Arborist's National Midwinter Meeting

By DR. PAUL E. TILFORD  
National Arborist Association, Wooster, Ohio

A few thousandths of 1% of a wetting agent may reduce the repelling forces at the surface of a drop of water by as much as 60%, Robert A. Moore revealed during his discussion on wetter water at the recent midwinter meeting of the National Arborist Assn., at Tampa Fla.

Moore, of the Aquatrols Corp. of America, Camden, N. J., explained how to overcome some difficulties in watering trees and other plants. He pointed out that dry soil is slow to take up water and when the root ball of a newly planted tree is dry, water applied may run off to saturate the backfill and not penetrate the root ball.

Water treated with a wetting agent overcomes this tendency and will penetrate and wet the dry root ball. Moore reported many instances where watering the root ball of trees before planting and in regular maintenance after planting has proved beneficial. This practice has resulted in quicker starting and more rapid recovery by the tree after it is moved. Root damage and subsequent wilting is prevented by moisture that penetrates the root ball.

Fred Galle, director of horticulture, Callaway Gardens, explained many laborsaving tools used to develop and maintain the 2500-acre garden, recreational area, and golf course at Pine Mountain, Ga. Drills up to 24-inches in diameter, operated by power take-offs, are used in practically all tree and shrub planting. A large vacuum-type leaf collecting machine has been devised, and many other items of equipment have been modified or actually constructed in the shop at Callaway Gardens for a particular use.

Galle stressed the importance of good maintenance of all tools and equipment if they are to last and do properly the job for which they are intended.

Slides showing operation of a new tree mover were presented

by H. M. Van Wormer, Van Wormer Tree Service, Richmond, Va. The new tree mover for moving exceptionally large trees with a large root ball assures successful replanting because of the large amount of earth the machine scoops up with the tree. Relatively fewer roots are disturbed in the moving operation, and with proper backfilling and provision for proper drainage, a large tree will continue to grow at its new site.

Business management sessions included cost accounting, bookkeeping, office management, and the use of bookkeeping machines. George Goodall, Jr., Portland, Maine, Mrs. Jane Smith, Lansing, Mich., and John Duling, Muncie, Ind., conducted these sessions. The National Cash Register Co. demonstrated an accounting and bookkeeping machine for use by medium to large tree service companies.

Application of the Wage Hour Law to the tree-care industry was explained by Henry A. Huettner, regional director, Wage and Hour Division, U.S. Dept. of Labor, Atlanta, Ga. Recruiting men and good employment practices were discussed by Byron Harless, Industrial Psychologist, Tampa, Fla.

The next meeting of the National Arborist Assn. will be in conjunction with the International Shade Tree Conference at Cleveland, Ohio, August 28-Sept. 2, 1966.

### Bean Has Rotomist Catalog

A new 8-page, 2-color, illustrated catalog describing use of four models of the Rotomist mist blower line, may be of interest to applicators who contemplate acquiring spraying or mistblowing equipment.

The catalog gives complete details and production capacities of the equipment. For a copy of Catalog L-1452, write John Bean Division, FMC Corp., Box 9490, Lansing, Mich. 48909.

Dyrene is formulated expressly for park superintendents, golf course superintendents, greens keepers, managers and other professionals engaged in the care and maintenance of lawns and turf.

Dyrene's broad spectrum effect combats or prevents all major turf diseases. When used as recommended, it controls: brown patch • copper spot • dollar spot • leaf spot • melting-out • rust • snow mold (*typhula* sp.).

Under normal weather conditions, apply Dyrene at the rate of 4 oz. per 1,000 sq. ft. every 7-10 days. During weather particularly favorable for disease, such as high temperature and humidity, Dyrene may be applied more frequently (5-7 day) or at higher dosages (6-8 ozs. per 1,000 sq. ft.) to keep disease under control with no injury to fine turf grasses. Frequently

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golf course and park superintendents use a Dyrene program of 3-4 ozs. per 1,000 sq. ft. of turf on a 12-14 day schedule. This has resulted in disease-free turf all season. When using Dyrene to clean up a disease condition in turf, use 6-8 ozs. per 1,000 sq. ft. for best results.

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# Scientific Progress Toward Landscape Beauty

## Highlights U. of California Conference

New findings from research and field experience in turf, landscape tree, and nursery production were featured during a special conference on the University of California campus at Davis, Feb. 23-25.

Converging on the campus for the three-day meet were almost 500 golf course and park superintendents, city landscape officials, nurserymen, and others.

### Durable Turf

Agronomist from the University of California, Victor P. Youngner, described UC studies which indicate that *Puccinellia*

*distans*, hybrid bermudas, and *st. augustinegrass* are most tolerant to adverse conditions. He also cited recent studies which have listed salt tolerance of various bermudagrass varieties.

"Requirements for special soils such as putting greens are fairly well understood, although there are different ways of solving the problem," commented UC Landscape Horticulturist John Madison.

"Our principal ingredient in this mix is going to be sand, but we need at least 10% clay if we are going to grow the best grass with the least trouble," he con-



Representatives from all areas of the landscape tree and turf field converged on the University of California campus for the three-day conference.



Booming turfgrass industry in California was topic of Turf Day chairman Robert Lateer (left), of the Loamite Division, Pope & Talbot, Inc., San Francisco. In the center, salinity tolerance in turfgrasses is described in studies presented here by UC agronomist Victor B. Youngner. Sod Industry growth in California as related to ready-to-use yards for new buildings was described by Edward Mutoza (right), of California Turfgrass Nursery, Inc.



Landscape representatives at the conference were (l. to r.): Ed Price of San Francisco, president of the Western Chapter, International Shade Tree Conference; Austin Carroll, Sacramento arborist; Tom Wilson, director of Richmond Recreation and Parks Dept.; and G. P. Robinson of Sacramento, program chairman for the landscape tree event, and chairman of the Western International Shade Tree Conference.

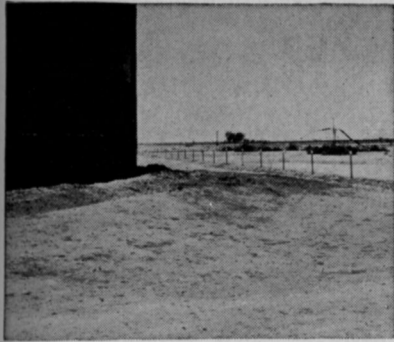
tinued. "More than 15% clogs the pores; less than 10% upsets the soil chemistry." Madison added that 10 to 20% organic matter will provide better fertility and water-holding capacity.

He pointed out that there are other, as yet untried, possibilities of solving the soil compaction problem in areas of heavy traffic.

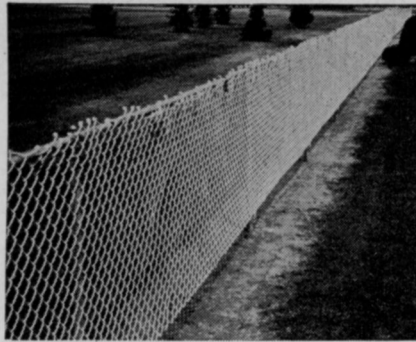
"For example, we could try using lumps of clay suspended in a sand matrix. Or we could build a green of alternate vertical columns of sand and soil. The sand columns could carry the weight, the water and the air; while the soil could provide the fertile growing medium," he theorized.

The business of growing vigorous turf, then stripping off the sod and selling it by the square foot is booming in California, noted Ed Mutoza of the California Turfgrass Nursery during another "Turf Day" talk. Mutoza, of Patterson, Calif., said the industry is expanding rapidly and cited heavy use by golf courses, and demand for finished landscaping along with new homes, motels, and apartment houses, as the chief causes of growth.

"A number of turfgrasses, mostly varieties of bluegrass,



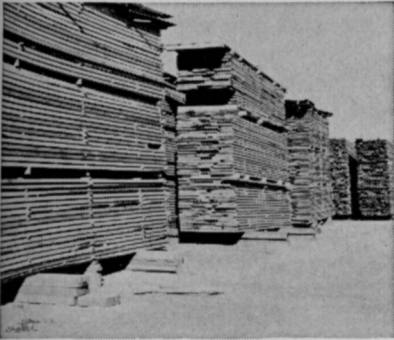
**Around this oil pumping station**—Hyvar® X bromacil weed killer controlled fire-hazardous vegetation all season. Other products containing bromacil, such as “Hyvar” X-WS, give equally effective control.



**Under fence lines**—Just one application of “Hyvar” X will control perennial weeds and grasses (such as Johnson, Bermuda, nut, horsetail, plantain, wild carrot, and bouncing bet).



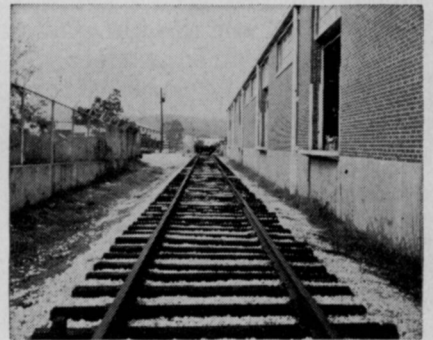
**Around fire hydrants**—“Hyvar” X is ideal for initial treatment of weeds and grasses because it offers broad-spectrum control and persists in the soil to give long-term, low-cost control.



**In lumber yards**—Control moisture-holding vegetation that tends to decay lumber. Unwanted vegetation also creates fire hazards during dry periods. Applying “Hyvar” X-WS bromacil prevents these problems.



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fescus, and bentgrass, are grown as sod in California," Mutoza noted.

#### Home Pools Damage Trees

Careful study of the tree and its environment, plus close contact with specialists in plant pathology and other sciences, is vital in troubleshooting with landscape trees, Sacramento arborist Austin B. Carroll reported.

"Swimming pools on the downhill side of a tree can increase soil moisture, and at times enough to damage trees," explained Carroll.

Systemic insecticide implantation in some landscape trees will be commercially feasible, forecasted entomologist Carlton S. Koehler from UC, Berkeley.

#### Steam Sterilization

California nurserymen should make more general use of sterilization of soil by aerated steam, UC Plant Pathologist Kenneth F. Baker advised. He presented



Examining a tree section above are (l. to r.) entomologist Carlton S. Koehler, landscape horticulturist Andrew Leiser, and turf and landscape specialist William B. Davis.

research on the process along with UC Extension Engineer Robert Brazelton.

"It appears that the use of aerated steam to sterilize soil batches is a relatively simple process for which equipment can be constructed locally and at a low cost exclusive of the steam source equipment," Brazelton explained.

## ISTC's Western Chapter Sets May 15-18 for Its 33rd Annual Meeting in Fresno, Calif.

"Trees . . . Living Symbols of Our Natural Beauty," is the theme toward which discussions and studies will be directed during the 33rd annual meeting of the Western Chapter, International Shade Tree Conference, May 15-18.

Ed Price, chapter president, announces the four-day meeting will take place at the Del Webb Town House, Fresno, Calif. Price, who is assistant to the president of Davey Tree Surgery Co., San Francisco, says that final arrangements are now progressing toward a highly educational program.

Subjects to be presented include: "Highway Beautification—The Federal Interest," "Quality in Trees," "Beautification—The Arborist's Obligation and Opportunity," and "Street Problems at 50° Below—100° Above."

Arborists attending this convention will be given a complete presentation of Fresno's Fulton Mall renewal project. Speakers

will give details on the planning, construction, and economic aspects of this well-known urban redevelopment program.

Greater national interest in highway beautification, transformation of drab city streets to tree-lined avenues of splendor, use of more trees in parks, industrial sites, and in every area where land improvement can be realized, will be topics of the convention.

Following the established custom, a past president's breakfast will be held early in the morning, May 16. A luncheon and the annual dinner are to be highlighted with speeches of pertinent interest. Visits to the region's parks, renewal areas and a post-convention tour of Yosemite Park are also planned.

Participating in various parts of the convention are: Jack Rogers, vice president, Western Chapter, ISTC; Brian Fewer, Municipal Arborists Committee, San Francisco; Riley Stevens,

#### Book Review

#### Insects in Relation to Plant Diseases

by Walter Carter, John Wiley & Sons, New York, N.Y., 1962, 705 p., \$25.00.

Describing explicitly the insect's relation to plant disease, this three-part volume will be of special interest to learned contract applicators and nurserymen.

In his well-arranged, generously documented book, *Insects in Relation to Plant Diseases*, Dr. W. Carter has revealed many mechanisms by which fungi, bacteria, and viruses are transmitted by insects. Characteristics of disease conditions caused by insect feeding or egg-laying, insect infestations, and salivary toxins are meticulously described and clearly exemplified by numerous illustrations.

Of the 13, technically written chapters, seven deal with plant viruses. These chapters provide basic, up-to-date information on the biological nature, classification, vector relations, and ecology of viruses which cause plant diseases.

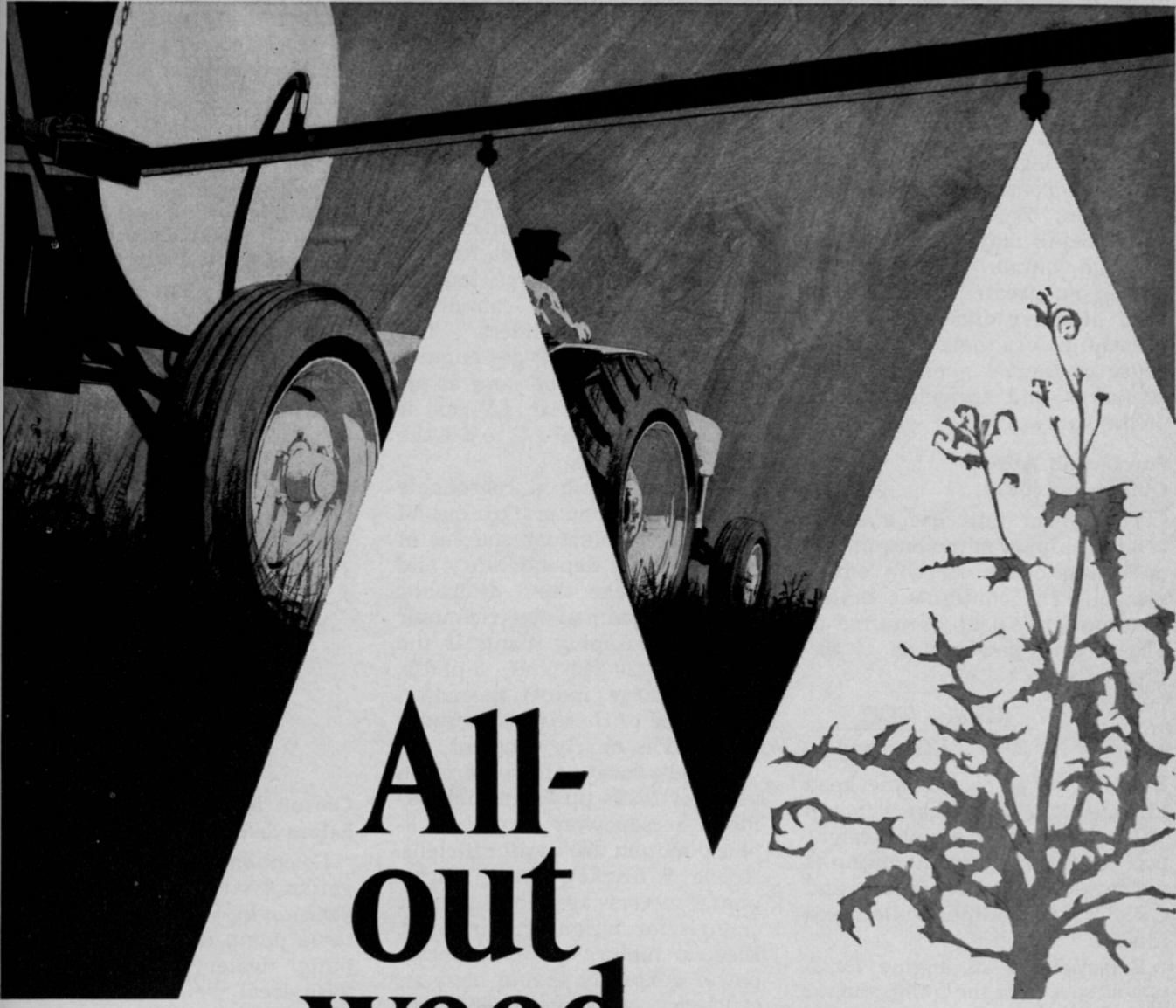
Chemical, cultural, biological, and insect vector control are methods explained in the last chapter which is devoted to control of viruses and virus diseases of plants.

Diseases of various plant groups are covered. Diseases of ornamental, shade, and fruit trees are discussed, and many agronomic crop diseases are included.

Readers interested in how organisms cause disease conditions in plants and how insects expedite plant infection are certain to benefit from this technical volume.

chapter past president; James Poindexter, of Sacramento, Utility Arborists Committee; Roy Wells, chapter past president; and Austin Carroll, Commercial Arborists committee, of Sacramento.

More information and reservations can be obtained by writing to the Parks and Recreation Department, City of Fresno, 890 W. Belmont Ave., Fresno, Calif. 93728, Att. Sam Setencich.



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## What to Consider When You Plan Irrigation Systems

(from page 11)

to 80% of their effective diameter should not be expected to give any degree of uniform application consistent with good irrigation; 50% variations in water depth may be expected.

Large-volume guns should be spaced no greater than 50% of their effective diameter. Winds greatly distort their pattern because of their higher operating pressures and trajectory angle of the spray.

### Power Unit Affects Output and Cost

The power unit has a direct relationship on pump output and operating costs of the entire system. The continuous brake-horsepower (c.b.h.p.) required of a pumping power unit is expressed as:

$$\text{c.b.h.p.} = \frac{\text{GPM} \times \text{TDH}}{3960 \times \text{Efficiency}}$$

TDH is the total dynamic head (distance, in feet, that a pump will push water in a pipe straight up); "Efficiency" of the pump is expressed as a decimal, and GPM = pump output, gallons per minute.

Selection of an engine for a power source of the pump should be based on the continuous service rating (c.b.h.p.), rather than the maximum brake-horsepower (BHP) rating. The engine should be loaded to no more than 80 or 85% of its maximum power. However, diesel engines can be driven harder.

Gasoline, diesel, LP-gas, and electric motors are all used for irrigation power units. Each has advantages and disadvantages,

and Table 3 shows ratings of each type.

Gasoline engines have two principal advantages over diesel and LP-gas engines. These are (1) lower initial costs and (2) service is more readily available. On the other hand, diesels have a longer life. LP-gas engines require less maintenance than gasoline engines, and fuel is cheaper. Another advantage of LP-gas is that fuel cannot be taken by "night raiders." The cost of operating LP-gas engines is approximately the same as for gasoline engines if LP-gas is available for about 2/3 to 3/4 the price of gasoline.

When available at reasonable rates, electric motors are one of the most satisfactory sources of power. Their dependability and long life make them desirable. The most common electric motor used for pumping plants is the 60-cycle, 220-240 volt, 3-phase, squirrel cage induction motor. The speed of these motors under full load is nearly constant.

Single-phase motors are often used for loads up to and including 5 horsepower. However, 3-phase motors are more efficient. Above 5 horsepower, single-phase motors are not efficient enough for irrigation pumping. Electric motors above 5 horsepower generally should have an efficiency of between 88% and 90%. Most squirrel cage induction motors operate satisfactorily under a continuous 10% overload.

Electric motors should always be protected against excessive heating due to overloading or undervoltage. In addition, larger motors will require a starter or starting compensator.

The following formulas may

be useful to compute pumping costs when you decide whether to use electricity or internal combustion engines. However, this is only on the basis of operating costs. Fixed costs should also be weighed before a final decision is made.

### Pumping Costs:

(1) Internal Combustion Engines:

Hourly pumping costs =

$$\frac{Q \times h \times F_c \times d}{3960 \times E} \quad (\text{in cents})$$

Where: Q = Discharge in GPM  
h = Pumping head in feet

F<sub>c</sub> = Fuel consumption in Gal. per HP hour  
d = Cost of fuel in cents per gallon  
E = Pump efficiency

(2) Electric Motors:

Hourly pumping costs =

$$\frac{Q \times h \times c}{5310 \times E \times e} \quad (\text{in cents})$$

Where: Q = Discharge in GPM  
h = Pumping head in feet

c = Cost of elec. in ¢ per KWH  
E = Pump efficiency  
e = Efficiency of electric motor

### Consult Dealer Before Selecting Pump

Selection of a pump for an irrigation system should be a joint decision by you and a local reputable pump dealer. The trained pump dealer must be familiar with local well and water conditions. His recommendations should be based on three primary conditions: (1) the amount (rate) of water and pressure you need; (2) the specific water source and conditions; and (3) the size of investment you plan to make.

### Two Pumps Used Most

Probably the two most common types of pumps used are (1) horizontal centrifugal pumps and (2) vertical centrifugal (or deep well turbine) pumps.

Horizontal centrifugal pumps are used where ample and dependable surface water is available from wells or lakes at suction lifts of less than 15 to 20 feet. This pump is generally used in irrigation because of its low initial cost and high operating efficiency. The pressure the pump develops depends on

**Table 3. Average performance of irrigation pumping units from Nebraska tests.**

Power Unit	Max. Possible BHP Hrs./gal.	Avg. Fuel Consumption BHP Hrs./gal.	Annual Costs (Oper. & Maint./100 hrs.) ***
Gasoline	11.2	6.9	\$11.40
Diesel	15.2	11.2	\$15.34
Propane	8.7	5.7	\$10.99
Natural Gas	8.3*	5.4*	\$11.50
Electricity	1.20**	0.93**	\$ 1.00

\*BHP—Hours/100 cu. ft. gas.

\*\*BHP—Hours per KW.

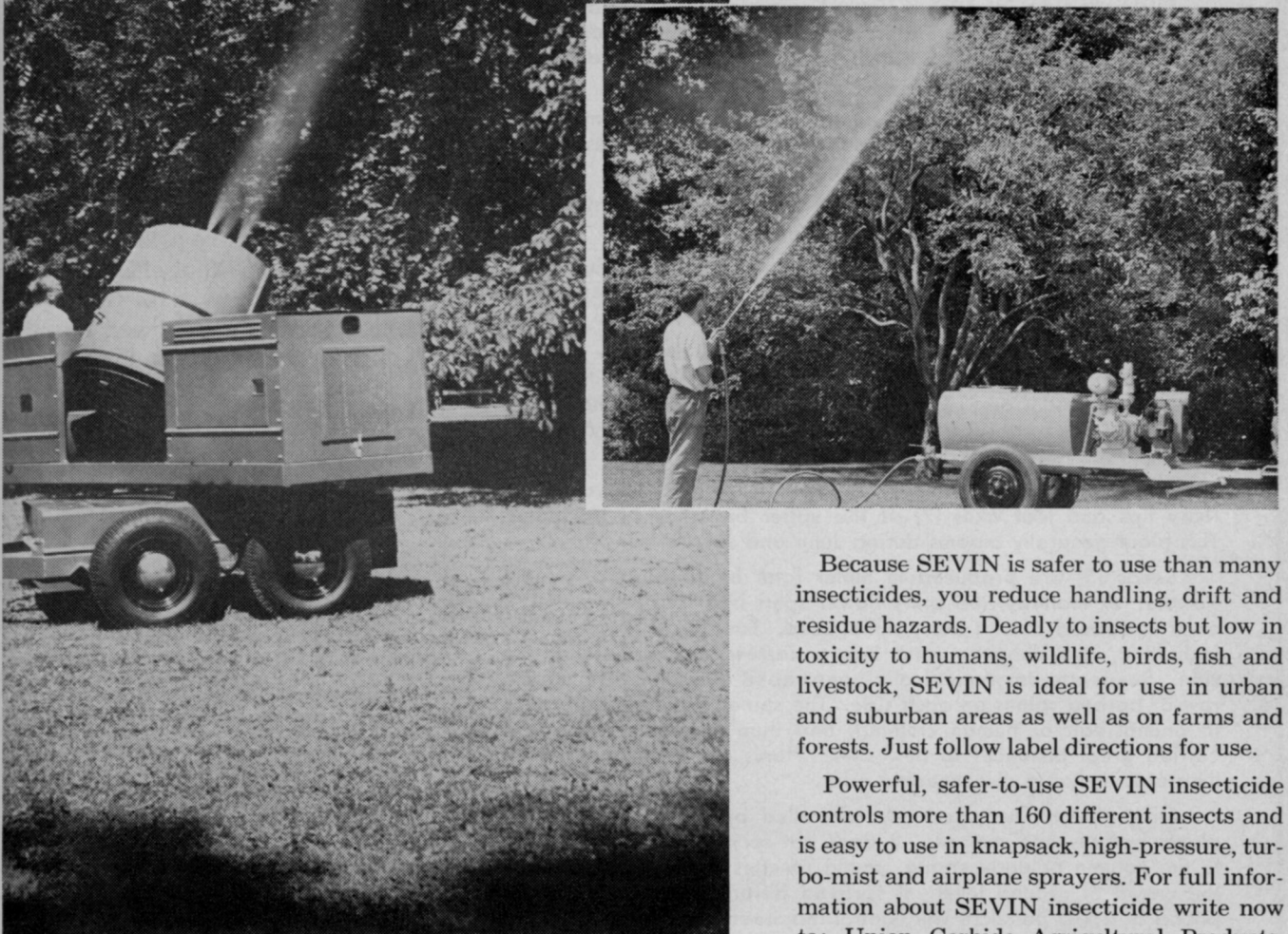
\*\*\*For 1000 or more hours use annually.



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## AGRICULTURAL PRODUCTS

## STICKTIGHT (*Lappula echinata*)



Sticktight was introduced from Europe and Asia and is now widespread in the United States. It is found growing commonly in dry or sandy soil near roadsides, wooded areas, fencerows, and in industrial waste areas.

*L. echinata* is classed as an annual or winter annual and reproduces by seeds only. Other common names for this species include blue stickseed, burweed, bluebur, and sheepbur.

Its root is a deeply penetrating taproot type with numerous lateral branches.

Stems (4) are rough and covered with short, white, fine hairs. These give the stalk a grayish appearance. The slender stem grows erect from 1 to 2 feet tall and branches widely at the top.

Leaves grow alternately from the stem and are also covered with soft white hairs. In the mature plant, leaves are from 1 to 2 inches long and from 1/16 to 3/16 inches wide. Young plants show a rosette form (3) of leaves which spread near the crown at ground level. Seedlings (1) have only 2 leaves.

Flowers are small and have 5 blue petals. They are borne in the leafy tips and leaf axils (7) of the upper branches of the plant. This plant generally blooms during June and July.

Seeds (5) are produced in nutlet form by four-lobed, female flowers. At maturity, the spiny flower splits into four segments (2), each composed of one burry nutlet seed. Each seed is about 1/8 inch long, grayishbrown, and has a narrow scar (6) along one side. Seeds are unsymmetrically pearshaped overall with a double row of barbed spines on each side. The spined nutlets readily stick to animal hair or human clothing, and thus seeds sometimes are carried great distances to new sites. Plants are seldom eaten by livestock. It has a disagreeable odor.

Sticktight can be effectively controlled by closely mowing the plants before seed matures. It does not survive under cultivation. In the autumn or early spring, young rosettes should be cut below the crown at ground level. If sprayed before bloom 1/2 to 3/4 pound of 2,4-D per acre will control this weed.

*Prepared in cooperation with Crops Research Division, Agricultural Research Service, United States Department of Agriculture, Beltsville, Maryland*

(DRAWING FROM NORTH CENTRAL REGIONAL PUBLICATION NO. 36, USDA EXTENSION SERVICE)

the rim speed and design of the impeller. They should always be operated at the recommended RPM; when we increase the speed one-third, the horsepower requirements are more than doubled.

The vertical or turbine pump has performance characteristics very similar to those of centrifugal pumps since they both operate under the centrifugal principle. Turbines, however, cannot operate at a high efficiency over the wide range of conditions that horizontal centrifugal pumps can.

### Consider Pump Efficiency

Pumping at a rate of 450 GPM will deliver approximately one inch of water on one acre in one hour (one acre-inch). Thus, for a water requirement of one-half of an acre-inch per hour, a flow of  $\frac{1}{2} \times 450$  or 225 GPM is needed.

The efficiency of a pump is very important. Consider a 40-acre permanent system where the field is to be irrigated in quadrants, and the pump required is to have a 450-GPM output at a 250-foot TDH. If we select a pump with 70% efficiency, the horsepower requirements are 40 continuous brake-horsepower (c.b.h.p.). In the same situation, if we are careful and choose a pump with an efficiency of 83%, the horsepower required is reduced to 35. Operating 720 hours annually (9 irrigations each at 0.15-inch per hour), using an LP-gas engine with fuel at 12¢ per gallon, the annual fuel savings, alone, is approximately \$100. This results by using the most efficient pump, and there are additional savings by purchasing the smaller motor.

Selection of an irrigation system should be based on all factors concerned. Determination of the soil moisture conditions, uniformity of application, sprinkler spacings, and both fixed and operational costs should be based upon current research and on good engineering concepts tempered by local field experience.