control of crabgrass and other for as little as \$15 an acre.*

On northern cool-season turfs, one yearly application provides effective control. On Southern warm-season turfs, where a heavier and a second application of Balan may be needed, the

- cost will be higher. Even so, Balan's economy
 makes it ideal for use on your fairways, roughs, and clubhouse grounds—areas you may have
- thought were too costly to treat.
- All-season control: weatherproof Balan stays put. Many herbicides are very soluble in

water and subject to leaching. Rainfall or irrigation will quickly wash them out of the weed control zone. Not Balan. Balan's low solubility and unique ability to adhere to soil particles means that it stays put. Balan resists leaching, even under excessive rainfall or irrigation, to give you months of control. On warm-season turfs and in Southern areas where the growing season exceeds 4 to 6 months, an additional application may be necessary for continued control.

<text>

ELANCO PRODUCTS COMPANY:

I'd like to know more about Balan granular pre-emergence herbicide. Please send me complete technical information.

I'm interested in treating a total area of_____acres.

I presently use a pre-emergence herbicide on_____acres of fairway; on _____acres of rough; on_____acres of clubhouse grounds.

Name	Title	
Establishment		
Address		
City	State	Zip





Balan is easy to use.

You'll appreciate Balan's convenient granular form. There's no messy wettable powder or spray to handle. Granules pour smoothly and won't clog equipment.

Both drop-type and rotary-type spreaders, commonly employed to apply granular herbicides and insecticides, may be used to apply Balan. However, a spreader which provides a consistently uniform distribution of granules is recommended. Use a spreader which avoids any uneven distribution or concentration of the herbicide in narrow bands and spreads the granules evenly over the area.

Balan offers a good safety margin. Balan will not injure these established turf grasses when applied as directed: perennial bluegrasses, perennial ryegrass, fescue, centipedegrass, St. Augustinegrass, Bermudagrass, zoysiagrass, and bahiagrass. And Balan contains no poisonous arsenic, mercury, or lead. Used properly, it attacks only your undesirable grasses by killing the seeds as they germinate. It does not control established problem grasses.

Dependable, long-lasting Balan—the turf herbicide formulated for professional use. Do you want technical information or assistance? It's yours for the asking. Then watch Balan go all out, all over, all season to give you even better looking turf.



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Turfgrass continued

fertilization. The study was conducted over a duration of 333 days at a temperature of 72° F. and a night temperature of 67° F. Nitrogen uptake rate was the most rapid for ammonium nitrate and urea. Coated (dicyclopentadiene copolymer) urea was intermediate in nitrogen uptake rate and the ureaformaldehyde (AI-55) nitrogen carrier gave a higher rate during the later stages of the study made.

The apparent recovery of applied nitrogen from the various nitrogen carriers after 333 days was highest for the coated urea and ammonium nitrate carriers with recoveries of 75 and 74 percent respectively. The recovery of urea and ureaformaldehyde will be significantly less at 59 and 41 per cent respectively.

Comments: The test species used in this study was orchardgrass which is not a common component of turfs. However, this fact does not detract from the very interesting results reported concerning the efficiency of these nitrogen carriers. A major portion of the nitrogen not recovered when applied as urea was probably lost by volitization to the atmosphere. In the case of the ureaformaldehyde it is possible that the nitrogen had not yet become available even after 333 days.

Other papers of interest

A Review of Turfgrass Research at Michigan State University.

J. B. Beard and P. E. Rieke. pp. 1-20. 1967. (Department of Crop Science, Michigan State University, East Lansing, Mich. 48823).

Can you work with Poa annua. N. F. Bartlett and J. Troll. Massachusetts Turf Bulletin. 4(3):5-9. 1967. (Department of Plant and Soil Science, University of Massachusetts, Amherst, Mass. 01003).

About the author—Dr. James Beard graduated summa cum laude from Ohio State University in 1957, received his Masters in turfgrass physiology and management in '59 and his PHD in '61. Since then he has been conducting a research and teaching program in the Crop Science Department at Michigan State University on environmental stress physiology of all types of turfgrasses. NEW SINGLE-BELT DRIVE



For greener turf from tee to putting green, the swing is to the LARSON line. LARSON engineering specialists have built SPREADABILITY into every feature of their new SINGLE-BELT DRIVE LARSON BROADCASTER. The LARSON BROAD-CASTER spreads 41/2 times more area in one trip than an ordinary spreader, covers up to 20 acres per hour! You get an even flow of material (milorgranite, fertilizer or seed) with uniform spreading on turns (even the sharpest ones). An accurate spread pattern, a broad cast (up to 50 ft.) . . . all this with ease of fingertip feed control, without changing the application rate. The LARSON BROADCASTER is the ideal unit for close work around Greens, Tees, Parkways, and Club House.

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MODEL 411 TRAILER-TYPE — 15 cu. ft. capacity (approx. $\frac{1}{2}$ ton). PTO powered. An ideal unit for most applications. Rugged, easy to handle, trails well, even over rough terrain.



MODEL 413 "PIGGYBACK" — 15 cu. ft. capacity. All the features of the 411 BROADCASTER. Attached to tractor by simple 3-point hock-up. Three-point hitch adapters available for all tractors.



MODELS 411G and 421G — Same models as shown above, with gas engine drives. (Engine is 960 3½ hp. — with 6 to 1 back gear.) Converts readily to regular drive by installing power take-off.

For complete specifications, Write, Wire or Call TODAY!



For more information circle number 136 on card

39th Turfgrass Conference and Show

Supers to view "what's new"

Over 3,000 GCSAA members, agronomists and educators will come this year to see the "Greatest show on turf."



The Golf Course Superintendents Association of America will hold its 39th Annual International Conference and Show February 18-23 at the Hilton Hotel in San Francisco, California.

The educational conference will attract more than 3,000 golf superintendents, agronomists and educators. This year's conference theme is: ''What's new...and how to use it'' as regards maintenance of golf courses. Over 40 leading superintendents, scientists and educators will address the educational meetings.

The opening day of the conference, papers will be presented on ''Golf course beautification,'' including a review of the superintendent's responsibilities towards other golf club sports facilities such as swimming pools, tennis courts and curling. Other papers will cover, ''Water usage,'' ''Tree roots and putting greens'' and ''Light studies on vegetative growth.''

On Tuesday morning, the "Greatest show on turf" will be formally opened by GCSAA president Walter Boysen, superintendent at Sequoyah CC, Oakland, Calif. Over 100 exhibitors will display and demonstrate the newest in turf equipment, materials and supplies.

Tuesday afternoon, the educational session will discuss advancing technology in the chemical industry and proper chemical application in turfgrass management.

Wednesday morning will be devoted to public course operation and demonstrations of small engines. In the afternoon, the GCSAA will hold its annual business meeting and election of officers.

The educational assemblies on Thursday will feature ''The putting green,'' presented by United States Golf Association Green Section agronomists. A concurrent session will cover ''Irrigation of golf courses.''

On Friday, the seventh educational assembly will discuss golf turf in general, soil salinity, helicopter spraying and maintenance building design.

Just prior to the conference and show, the Golf Course Superintendents Association of Northern California will host a National Golf Tournament, sponsored by the GCSAA, to be held Feb. 14-16.

The tournament will be played on well-known courses on the Monterey Peninsula, south of San Francisco.

Trophies for the six flights will include: the USGA trophy, to go to the champion GCSAA superintendent; the GOLFDOM trophy for the winning superintendent-pro; the Director's Cup for the winning GCSAA Chapter team; the O.J. Noer Trophy for the senior division winner; the Industrial Relations Committee Trophy to the winner in the exhibitors flight, and trophies to winning guests.

There will also be a Ladies Tournament to be held at Del Monte Golf Club on the Peninsula.

The complete educational program follows; day-by-day activities are on page 28 and a list of exhibitors starts on page 30.

FIRST

EDUCATIONAL ASSEMBLY Monday, February 19, 1968 9:00-11:45 A. M.

What's new and how do we use it?"

Chairman: Norman W. Kramer, co-chairman, Educational Committee; GCSAA director; and superintendent, Point O'Woods Golf and Country Club, Benton Harbor, Michigan.

Invocation: Father Len Scannell, St. Lawrence O'Toole's Church Oakland, California.

Official welcome: Welcome from host association by Chairman Clifford A. Wagoner, president, GCSA of Northern California and superintendent, Del Rio Golf and Country Club, Modesto, California.

Response to welcome and official opening of conference, Walter R. Boysen, president, GCSAA and superintendent, Sequoyah Country Club, Oakland, California.

"World food supply," Dr. Harold E. Myers, dean of College of Agriculture, University of Arizona.

"Wisdom and fun," Dr. Harvey C. Hahn, pastor, Otterbein Evangelical United Brotherhood Church, Dayton, Ohio.

SECOND EDUCATIONAL ASSEMBLY Monday, February 19, 1968 1:30-4:30 P. M.

"Golf course beautification"

Chairman: James W. Wilson, first vice president, Men's Garden Clubs of America.

"The front door," Warren A. Bidwell, superintendent, Philadelphia Country Club, Gladwyne, Pennsylvania.

"The effects of temperature and light on vegetative growth," Dr. Victor B. Youngner, associate professor of agronomy, University of California, Riverside, California.

"Water usage," Dr. S. J. Richards, professor and soils physicist, University of California, Riverside, California.

"Root competition betweentrees and turf," Carl E. Whitcomb, research associate, Department of Ornamental Horticulture, University of Florida.

"The superintendent and his 'other hats".

1. "Swimming pools," J. Henry Mohr, president, Nor-Cal Engineering Company, Redwood City, California—representing National Swimming Pool Institute.

2. ''Tennis courts,'' Dennis Van Der Meer, tennis professional at the Berkeley, California Tennis Club—representing United States Lawn Tennis Association.

3. "Curling," David Gourlay, superintendent, Thornhill Country Club, Thornhill, Ontario, Canada.

THIRD

EDUCATIONAL ASSEMBLY Tuesday, February 20, 1968

2:00-4:30 P. M.

"Advancing technology"

Chairman: Dr. James Watson, director, Agronomy Division of Toro Manufacturing Company, Minneapolis, Minnesota.

"The witches brew" (Skit-author anonymous) Cast of Characters:

Tom Leonard, past director GCSAA, Watson Distributing Company, Houston, Texas—(Superintendent doing things wrong). Gene Buckholt, Watson Distributing Company, Houston, Texas, (Doing things the proper way).

''Hinkley and Bruntley'' chemical news analysis.

1. Stan Frederiksen, manager, turf products, Industrial Chemical Division, Mallinckrodt Chemical Works, (giving cues) with

2. Dr. John L. Weihing, professor, Plant Pathology, University of Nebraska, (explaining problems).

"Proper chemical application," Mr. John P. Dunlap, superintendent, Oakwood Country Club, Cleveland, Ohio.

FOURTH

EDUCATIONAL ASSEMBLY Wednesday, February 21, 1968

9:00-11:00 A. M.

Public golf course operators clinic* Introduction: Ben J. Chlevin executive director, Golf Course Superintendents Association of America.

1. "Trends in golf course development," Col. Harry C. Eckhoff, director Eastern Region, National Golf Foundation.

2. "Golf courses for the public," Richard Haskell, director of golf, City of Seattle, Seattle, Wash.

3. "Golf course planning and economic feasability studies," William H. Sherman, Sherman and Associates. 4. ''Public golf course management,'' Nick Lombardo, Del Monte Lodge, Monterey, California.

5. "Adequate records for good control and budgeting," Richard A. Sincerbeau, Ellis, Arndt & Truesdell, Inc.

Small engine clinic *

Introductory Presentations by Manufacturers' Representatives.

Presenting Problems of Manufacturers: Roger Thomas, Jacobsen Manufacturing Company, Thomas E. Ames, Toro Manufacturing Company and Marvin T. Elstad, Ryan Equipment Company.

Demonstration Clinic on twocycle and four-cycle engines conducted by: Kenneth Weill, Jacobsen Manufacturing Company, James J. Holsen, Kohler Company and B. H. Robinson, Wisconsin Motor Corporation.

Concluding with a panel discussion by all participants.

*Clinics run concurrently.

FIFTH

EDUCATIONAL ASSEMBLY

Thursday, February 22, 1968 * Morning Session 9:00-12:45 P.M. "The green"

United States Golf Association

Introductory remarks, representative, USGA Green Section Committee.

"The putting green—focal point of golf." What the golfer expects the putting green to be.

''Putting green design.'' Please the golfer—ease maintenance.

"The ABC's of putting green construction," USGA movie.

"Green construction techniques and materials," panel discussion.

"Grasses for putting greens," The More Popular Strains, their requirements and peculiarities bentgrasses, bermudagrasses, species for overseeding.

"Turf establishment," seeding, stolonizing, bringing golf greens into play.

Panel discussion.

Afternoon Session 2:00-4:00 P. M.

''Maintenance of greens-how, why, when.''

Panel Discussion:

Mowing (height, frequency, techniques), vertical mowing, cultivation (aerifying, spiking, slicing, forking), topdressing, fertilizing, control of weeds, insects, diseases,



irrigation, ball mark repair, cup changing techniques, minimizing traffic damage.

*Fifth and Sixth Assemblies run concurrently.

SIXTH

EDUCATIONAL ASSEMBLY Thursday, February 22, 1968

Morning Session 9:00-11:45 A.M. "Irrigation clinic"

Chairman: Herman R. Johnson, GCSAA director, co-chairman Educational Committee, and superintendent. Ouail Creek Golf and Country Club, Oklahoma City, Oklahoma.

''Primary considerations.'' Do you need to irrigate? Do you have enough water to irrigate? Dr. A. W. Marsh, extension irrigation and soils specialist. University of California, Riverside, California.

"What kind of system does my course need? (a check list), R. R. Abernathy, Telsco Industries (Weather-Matic), Dallas, Texas,

''Primary Decisions'' What is my responsibility to the club in relation to the system plans and installation? Who designs and installs the system? What qualifications must the designer and installer have? Would automation be economical on my course? Don A. Hogan, D. A. Hogan and Associates, engineers, Seattle, Washington.

"Cost analysis"

1. Southwest-Major Fred Bove. superintendent, Brentwood Country Club, Van Nuvs, California. 2. North-Jerry Murphy, superintendent. Somerset Country Club, St. Paul, Minnesota,

3. West-Edmer Easley, superintendent, Wichita Country Club, Wichita, Kansas,

''Ouestions and Answers.'' Panel-(all morning session speakers).

Afternoon Session 1:30-4:30 P.M. ''Sprinklers,'' James Robinson, General Sales Manager, Skinner

Irrigation Company, Troy, Ohio "Pipe," A. W. Perry, Baton

Rouge, Louisiana.

'Controls'

''Timers,'' Jack Nees, Moody Sprinkler Company, Arcadia California.

"Hydraulic valves and tubes," lerry Rossiter, assistant to president, Buckner Industries, Inc., Fresno, California.

"Electric valves and wires." Ed Shoemaker, sales manager, Rainy Sprinkler Sales, Peoria, Illinois. "Pump Stations," Dr. John F. Schrunk, irrigation consultant, Schrunk's Agricultural Service, Arvada, Colorado.

'Programming and maintenance," James M. Kaufman, marketing manager, Moist O'Matic Sprinkler Division, Toro Manufacturing Company, Minneapolis, Minnesota.

SEVENTH

EDUCATIONAL ASSEMBLY Friday, February 23, 1968 9:00-11:30 A. M.

"What-another problem?"

Chairman: Richard Malpass, president, Northwest Turfgrass Association, secretary, Evergreen GCSA, superintendent, Shadow Hills Country Club, Eugene, Ore.

"Golf turf-good turf, weather or not!" Arthur F. Gustafson, Meteorologist-in-charge, San Francisco Weather Bureau.

"Rhizome initiation and development of kentucky bluegrass as influenced by variety, day length, and cold treatment," Dr. Lowell Moser, Ohio State University.

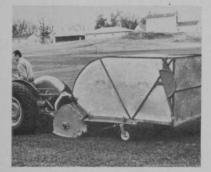
"Helicopter spraving"-tomorrow or today?" Mr. Charles Dupont, Clarke Outdoor Spraving Company, LaGrange, Illinois.

"Maintenance buildings that work For you," Oscar Miles, superintendent, Olympia Fields Country Club, Olympia Fields, Illinois,

Invitation to Miami Beach, Florida, 1969, by South Florida GCSA

Closing Remarks: Herman Johnson, co-chairman Educational Committee, director GCSAA, superintendent Quail Creek Country Club, Oklahoma City, Oklahoma.

VEVV PRODUCTS



Ryan Equipment Company have announced their new Ryan Grounds Groomer (GG60-1). It prepares turf for overseeding, sweeps, picks up and deposits debris into its hopper. It uses the principle of free-swinging, high speed blades as a safety feature.



Bridgeport Implement Works, Inc. have disclosed their new Pixtone, the mechanical stonepicker. It is capable of picking stone from three-fourths inch up to a nine inch diameter to any controlled depth to four inches. Over-size stone can also be picked up with this new machine.



West Point Products Corporation has come out with its new Mini-Truck (R) grounds maintenance personnel/cargo carrier vehicle. It was designed specifically for grounds maintenance crews providing 16 cubic feet of cargo space. It features one-man ramp tail-gate loading.





Renovates, removes thatch, sweeps and flail mows in one operation

The Ryan GROUNDS GROOMER attaches to a tractor equipped with a 3-point hitch and PTO. The operator can adjust blade height or depth, as well as empty the 5-cubic-yard hopper without leaving the tractor seat.

The hopper has a double steel door. At the top of the hopper is a wire screen to prevent stones, etc., from being thrown out.

Its 5-foot-swath reel is equipped with four rows of combination mowing and slicing blades. The reel can also be easily changed to all mowing blades, making it a "flail" mower.

Blade cutting ranges are from 2'' into the ground for vertical slicing – to 3'' above ground for rough mowing. All blades are "free-swinging" and rotate in reverse. This design creates air turbulence which blows leaves, thatch, clippings, etc., into the hopper.



The GROUNDS GROOMER picks up thatch, clippings and debris in a 5-foot path.



The operator easily empties the 5-cubic-yard hopper from the tractor seat.



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Manufacturers of the world's finest turf-care equipment

Sunday, February 18 4:00 P.M. Teakwood B Association Planning Committee meeting 6:00 P.M. Walnut Room Association Planning Committee reception and dinner Monday, February 19 8:00 A.M. Walnut Room Ouarter Century Club breakfast 9-11:45 A.M. Continental Ballroom First Educational Assembly 11:45 A.M. Toyon Room Press and speakers reception 12:30 P.M. Walnut Room Press and speakers luncheon 12:30 P.M. Teakwood B Chapter editors luncheon 1-3:00 P.M. Continental Ballroom Parlor 9 Advisory Committee meeting 1:30-4:30 P.M. Continental Ballroom Parlors 5 and 6 Second Educational Assembly 6:30 P.M. Continental Ballroom Get acquainted party Tuesday, February 20 8:00 A.M. Walnut Room Past president's breakfast

Highlights For Week of GCSAA Show

9:00 A.M. Official opening of exhibits 11:00-12:00 Noon Continental Ballroom Parlor 9 Delegates meeting 12:00 Noon Continental Ballroom Parlor 7 Greens Chairman reception and luncheon 2:00-4:00 P.M. Continental Ballroom Parlors 5 and 6 Third Educational Assembly 3:00-5:00 P.M. Continental Ballroom Parlor 9 Advisory Committee meeting Wednesday, February 21 7:45 A.M. Continental Ballroom Parlor 7 Industrial Relations Committee breakfast 9:00-11:00 A.M. Continental Ballroom Parlor 5 Fourth Educational Assembly "Clinics"-Public course operators clinic 9:00-11:00 A.M. Continental Ballroom Parlor 6

Fourth Educational Assembly "Clinics"-Small engine clinic

11:30-12:30 P.M. Continental Ballroom Parlor 7

Delegates meeting

12:00 Noon Continental Ballroom Parlor 8

Father, son and son-in-law luncheon

1:00 P.M. Continental Ballroom Parlors 5 and 6

Annual Meeting-Election of officers

Thursday, February 22

9:00-4:00 P.M. Continental Ballroom

*Sixth Educational Assembly-Irrigation Clinic

9:00 A.M.-4:00 P.M.

*Fifth Educational Assembly-"The Green"

*Run concurrently

12:00 Noon Continental Ballroom Parlor 7

Chapter Secretaries luncheon 7:00 P.M. Continental Ballroom

Annual banquet Friday, February 23

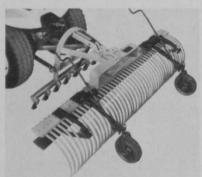
9:00 A.M.-11:30 A.M. Continental Ballroom

Seventh Educational Assembly

NEW PRODUCT



Roseman Mower Corporation has developed a new hydraulic transport Lo-Cut mower, designed primarily for mowing trees and collars or aprons around greens. The high speed, 10 blade reel gives a one-half inch frequency of cut, with a low setting height of threeeighths inch.



York Modern Corporation presented their new rake unit for category 'O' 3-point hitch tractors. The model RS combines a scarifying, blading and raking in one compact tractor-rake combination. It removes stones and debris and also spreads topsoil.



H. D. Hudson Manufacturing Company now has a tandem wheel set for power sprayers, designed to prevent wheel marks on the turf. The set distributes and spreads the weight of the spraver over a wide area, thus carrying the load on top of the turf. The sets are 'available separately or as original equipment on either 100, 150 or 200 gallon sprayers or sprayer trailers.



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NITROFORM Turf Food AZAK® Pre-emergence Herbicide for

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