

Michie Stadium, West Point, N. Y., three weeks after seeding to 50-50 mixture of Merion and Kentucky bluegrass. Seed was pre-germinated.



Closeup of bluegrass in Michie Stadium three weeks after seeding. Col. R. P. Reed supervised the project.

1956 Turf

By **FRED V. GRAU**

Choose grass that will
be permanent • Check

this summary for leading turfgrasses in general use
throughout the U.S. • New strains to be considered

This old world of ours is in a violent period of climatic changes. It may be too hot one year, too cold the next — the same with wet or dry. Emphasis for years to come must be upon those grasses that can tolerate the greatest extremes of climate with minimum requirements of irrigation. They must have resistance to disease and insects, and maximum ability to recover from unforeseen and unpreventable injury.

Selection of grasses is No. 1 on my list. Without a good sturdy grass all the fine equipment and expensive labor is in vain. We seek grasses which will be permanent once they are planted and which will give maxi-

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This is the second of two articles. The first appeared in October, 1956 GOLFDOM, page 58.

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mum satisfaction with minimum care. Our program of developing superior grasses is in its infancy.

For the record it will be well to name here the leading turfgrasses in general use over the country.

Kentucky bluegrass: Standard. Has definite regional adaptation, intolerant of close mowing demanded by many sports, susceptible to leafspot disease which weakens the grass just in time for crabgrass invasion. Resistant to rust.

Merion Kentucky bluegrass. Has a definite regional adaptation, tolerates close mowing, highly resistant to leafspot, susceptible to rust,

especially when not properly fed.

It has been shown that 50-50 mixtures of Merion and standard Kentucky bluegrass may have definite advantages over either alone. The weak point of one grass is masked by the strength of the other. Best suggestion: Buy straight seed of each, mix your own.

There are other bluegrasses on the horizon but performance to date does not seem to be enough better than standard Kentucky to warrant suggesting more than trial plantings. All have been rated lower than Merion in test trials in the east. (Arboretum, Delta, Troy, Minnesota 95).

Better bluegrasses than those we have today are on the way.

Fescues have dropped in popularity for turf use. Diseases, heat and wear quickly ruin turf of fine-leaf fescues. The new Pennlawn, now on the market, may revive interest in fescues. There should be a trial plot (nursery) of Pennlawn on every golf course in its range of adaptation.

Tall fescues are becoming more popular in turf circles for certain areas and types of use since the first large lawn was planted to Alta in 1947 at Beltsville. The coarse blades and clumpy nature become less conspicuous when seeded heavily 5 to 10 pounds to 1000 sq. ft., and when adequately fertilized and properly mowed. Resistant to drought, disease, wide range of soil pH, and insects, tall fescue deserves a thorough trial in test plots alone and in mixtures. Alta and Ken-

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Common Bermudagrass stand on Squad "C" field, West Point 9 days after planting pre-germinated seed.



Photos by O. J. Noer

Closeup of the Bermuda on the Squad "C" field. Growth of the pre-germinated grass was excellent in spite of the cool nights.

Roundup

Pre-germination Experiment • Summer fairway renovation •
By O. J. NOER
• What to do about iron chlorosis • Trend to use of lead arsenate on tees, greens grows during year

Several clubs have used sodium arsenite at heavy rates of 30 to 35 lbs. per acre during summertime in conjunction with fairway renovation programs. Customary procedure has been to use 2,4-D or a mixture of 2,4-D and 2,4,5-T in June to kill broadleaf weeds and clover. By using them then, the interval before seeding has been sufficient to dissipate any adverse effect upon seed germination. Fairways were fertilized generously and sprayed with the heavy rate of sodium arsenite in August, and again a week later at 5 lbs. per acre. They were seeded immediately afterwards and poor, weedy, clover infested fairways were transformed into excellent turf.

Similar treatment in a spring renovation program gave equally good results at the U. S. Military Academy. The method was tried on Squad "C" practice field which was mostly knotweed, clover and had every known kind of crab grass in midsummer. The field was aerified first in several directions, spike disced thoroughly and fertilized generously. This was done in late May. The surface was sprayed with sodium arsenite at 35 lbs. per acre with about 100 gals. of water. Another 5 lbs. per acre were used a week later. The field was seeded immediately with pregerminated common Bermuda grass seed at about 80 lbs. per acre. An alfalfa and grass disc seeder was used, with seed placement $\frac{1}{2}$ -in. deep. The field was seeded in two directions on June 6, using half the amount of seed each way.

Over-all cover looked good by June 19 due to pregermination. There were no weeds of consequence, only a few scattered crab grass plants. By fall there was a good stand of turf.

A small square section was roped off and not sprayed with sodium arsenite. By mid-June it was a solid mass of knotweed. It was renovated then and the subsequent cover with Bermuda grass was satisfactory by fall.

Various formulations of disodium methyl arsenite were sold in considerable volume in 1956. Its acceptance seems best in the South, probably because discoloration of Bermuda grass is negligible at rates which effectively control many weeds. Kill of sedge has been excellent. It is said to give promise of controlling crab grass, nut grass, dallis grass and even lemon grass. If preliminary good results continue, higher cost of disodium methyl arsenate over sodium arsenite can be justified for use on green and tees. In other areas it must produce superior results to justify the cost difference because discoloration of Bermudagrass is less annoying.

The fairways at Miami Shores were badly infested with weeds of all kinds, including dallis grass, crab grass, and lemon grass. Glen Byrd started a renovation program in June of 1956 after winter play stopped. He used the following mixture to kill weeds: 2 qts. Dimet formulation of disodium methyl arsenate, 1 pt. of their wetting agent, 1 qt. Dow 40 type

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Grau—Turf Roundup

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tucky 31 are two main types, the latter apparently better suited to Eastern U.S. New selections are under study.

Bent Performance Weighed

Among the bents there are certain favorites emerging. Cohanse (C-7) gets the nod where summer heat rules. The yellowish color may be a factor. Alex Repin gets the tip of the hat for showing us what can be done with Cohanse in Oklahoma heat.

C-1 and C-19 blend (Arlington and Congressional) is a favorite over a wide area. Those who have been outstandingly successful may never change or at least not until something superior has been proven to them. Mismanagement (of water) has caused separation of the two grasses at widely scattered locations (Missouri, Virginia).

Pennlu is up and down, cussed and praised. Not all "Pennlu" from different nurseries is alike. The original piece that I saw with Charles Hallowell at LuLu Country Club in 1935 is still there and still beautiful. Some users (Hazletts, Cleveland, Pittsburgh; Orr, Culbertson Hills) are pleased.

Penncross bent seed eventually may replace many stolon bents. Critical item is seed supply. Price per pound must remain high (\$10 to \$12 or more) because of expensive planting, harvesting, processing. Fields must be replanted frequently with certified stolons of three varieties (one is Pennlu). Not much seed in sight yet — more in fall 1957.

Toronto (C-15) bent is tops in Chicago. It seems to like the climate and the management of midwestern superintendents.

Velvet bents hold almost exclusively "down East" where the Mitchells work and play. Too "touchy" for some supts.; others wouldn't have anything else.

Warm-season grasses rapidly are getting deserved recognition and are steadily moving into the fringes of cool-season grass regions. In this broad belt where the two great groups come together there lies a rich potential for research and observation. Long an advocate of "The Combination" I am convinced more than ever that the right blend has great possibilities.

Bermuda is No. 1 for turf because of its capacity for punishment and power of recovery. Hall's U-3 gets credit for developing Bermuda-consciousness deep into cool-season territory.

Tiflawn (57) rose and fell with an almost uncontrollable mat.

Tiffine (127) rose and fell with almost uncontrollable grain and seed heads.

Tifgreen (328) is now being tested on a practical scale. Seedheads are in evidence. Performance and range of adaptation have not been determined in actual use.

Ugandagrass, in use for nearly 50 years on various sports areas in Cairo, Egypt, including putting greens, has been successfully used in the U.S. for putting greens (Snyder, Ari-

zona; Tiller and Baldwin, Virginia), for tennis courts (Seabright, N.J., Germantown Cricket and Merion Cricket, Penna.), for tees (Shields, Md., Thomas, Penna.; many courses in Illinois and Virginia). It has promise as a "collargrass" around bent greens where crowfoot (goosegrass) and common Bermuda are problems. Texture is like bent. One course has planted 18 greens and 18 tees to Ugandagrass (Pinecrest, Va.). Ugandagrass is not the same as the old African Bermudas.

Mageennisgrass (to be released by several experiment stations in spring, 1957) is now billed as Sunturf, for lawns. In tests it looks promising; should be tried in course nurseries.

Genetift, Ormond, Everglades, Pinehurst selection and others — each has its place, each is good in its own right. We have a big job ahead of us to sort out and evaluate the many strains for various uses.

Zoysias (common, Meyer, Emerald) have their place but have been over-promoted. New strains are being studied. Release in the future will be guided to indicate areas of adaptation and use. Meyer zoysia claims, performance and selling have been well documented by National Better Business Bureau, Kenneth B. Wilson, Pres. Early enthusiasm on Emerald seems to have cooled according to the few reports that have been made.

Fertilizers Are Reviewed

Organic, (Milorganite, Agrinote) still going strong, supplemented by Ureaform fertilizers (Nitroform, Borden's 38, Uramite). Long lasting and "foolproofness" dominate this field. Quickly available soluble nitrogen fertilizers still in heavy demand (sulfate of ammonia, ammonium nitrate) because of what they can do quickly on sturdy grass.

Burning is feared by amateur users; welcomed by professional men when controlled. Ureaform goods will increase in stature and tonnage without greatly affecting other types. Most turf still is starved for N; won't be caught up for a long time.

Soil Sterilants Grow in Use

Cyanamid, Dowfume, Vapam (newcomer) are being used more and more to assure

Turfgrass Meetings

Jan. 17-19 — Mid-Atlantic Turfgrass Conference, Lord Baltimore Hotel, Baltimore, Md.

Jan. 21-24 — Rutgers One-Week Turf Course, Rutgers University, New Brunswick, N. J.

Feb. 10-15 — 28th National Turfgrass Conference & Show, GCSA, Kentucky Hotel, Louisville.

Feb. 25-28 — Cornell Turfgrass Conference, Cornell University, Ithaca, N. Y.

Feb. 27-Mar. 1 — Minnesota Turf Conference, Curtis Hotel, Minneapolis.

low-cost weed control and purity of planted strains. Each material has its limitations. The user's choice depends on a number of factors. Use of these materials is increasing.

Pests, Diseases and Insects

Nematodes pushing *Curvularia* and *Poa annua* for No. 1 pest spot. If you can't identify your trouble call it nematodes. Maybe it is poor drainage but both need careful study to detect. Gene Nutter and associates in Florida really working hard on problem.

Diseases really are well under control. Frank Howard, Rhode Island, has done an outstanding job. Manufacturers are to be commended for research and development of broad-spectrum fungicides.

Insects no longer seem to hold terror for turf people who are informed. Sod webworm still is mistaken for dollarspot but then it probably always will be by a few. High-powered safe insecticides largely have eliminated insects as a major turf problem.

Water Problems Serious

Water conservation and proper use has risen to a high position on agenda of most turf-grass groups. It is serious in the Southwest. No area is free from the need for careful study of the subject.

We need "camel" grasses that can go long periods without a drink and still provide good playing surfaces. Soils need to be made and kept open to absorb water quickly. Excessive use of water degrades good turf, is wasteful, raises costs in several ways.

Golf groups everywhere could take the load off the superintendent's back by popularizing firm greens, depopularizing sloppy soft greens that will hold a low hard-hit brassie. Many troubles arise from excess water on areas not built to handle volume.

Research, extension, resident teaching, and the press can do much to awaken "water consciousness".

Poa annua will find its level with continued study and discussion. "If you can't lick 'em, jine 'em". Warm-season grasses will grow in popularity as we learn to use *poa* as the natural winter companion. It never needs reseeded, once you have it. Some research pointed this way is encouraging. Destruction of *poa* will be a long hard (losing?) battle. Some will succeed at the price of know-how, vigilance, and doing everything right. Water is one of the keys in the puzzle.

Equipment Improvement Continues

Equipment is improving steadily with keen competition and awareness of the demand for turf quality. A club is paying for good modern equipment whether or not it has bought it. Once it is bought there must be a man on the staff to keep it in top operating condition. The machine is only as good as its operator.

In the 1951 Roundup I mentioned "vacuum cleaners for fairways". This is still good. Ben Warren (Ill.) has one operating successfully on his turf nursery. Removing clippings will be a "must" where we have vigorous grasses

that respond to fertilizers, grasses that resist decay, and where we have eliminated insects which would grind up the clippings and mix them with the soil.

Extension Service facilities are paid for whether we use them or not. Extension services of the agricultural colleges are taking a more active part in turfgrass affairs. Extension service is there available for the asking at no cost.

You may say, "Our county agent doesn't know anything about greens". Maybe he doesn't -- but the specialists are available at his request. Maybe he can help you in business management, in setting up a budget, in drafting reports, in setting up demonstrations, in getting speakers for meetings. Don't miss the chance to invite your county agent to work with you. He might welcome an invitation to your meetings.

Gala Opening for New Country Club of Florida

Golf notables from the midwest and east attended the formal opening of the new Country Club of Florida, near Delray Beach, Dec. 1.

The course is on a 1250 acre tract which eventually will be sites of winter homes of a select group. Robert Bruce Harris designed an interesting, beautiful and testing course on rolling ground that once was a dairy farm. Charles Maddox built the course and Norman Johnson became its supt. while construction was in progress. Johnson has on his staff two first class supts., Matt Bezak, formerly in charge of Chicago district clubs, and Jerry Vanasse, on leave from a Connecticut club.

The course was brought into remarkably fine condition for a new course on opening day. Holes of the course are named for native birds.

Five residences for occupancy by members, and a charming small clubhouse have been completed.

Johnny Farrell of Baltusrol is professional. He is assisted by his sons, John jr. and Jimmy.

Carleton Blunt, Chicago attorney who is head of the Chick Evans Caddie Scholarship foundation, started the new private club off by financing it to the extent of approximately \$1 million.

Dawson Heads Mid-Atlantic

Thomas W. Dawson, of the Country Club of Virginia, Richmond, has been elected pres. of the Mid-Atlantic Association of supts. Other new officers include Paul E. Weiss, Jr. Sparrows Point (Md.) CC, vp, and Francis Coupe, Washington G & CC, Arlington, Va., secy-treas.

Noer — Turf Roundup

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of 2,4-D, and 25 lbs. ammonium sulphate in 100 gals. of water. This amount covered an acre. He sprayed at 5-day intervals until weed kill was complete. St. Augustine grass was killed along with other fairway weeds. Fairways were fertilized generously and some re-seeding with common Bermudagrass seed was necessary in a few areas. Results were exceptionally good.

The trend back to the use of lead arsenate on golf greens, and on tees, continued to gain momentum. Besides suppressing worms, lead arsenate helps discourage and control poa annua and crab grass. Annual applications range from 5 to 15 lbs. per 1,000 sq. ft. Several have started resumption of lead arsenate usage with two spring applications about a month apart of 7 to 8 lbs. per 1,000 sq. ft. each time. They plan to make only one application in subsequent years.

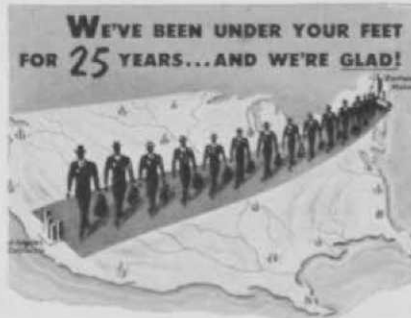
Some clubs are using lead arsenate on watered fairways again. This has been done mostly in the Midwest. Fairways here are better underfoot because of complete absence of worm casts, crab grass is less troublesome, and overall performance of grass better according to those who have charge of maintenance. Before deciding upon large scale fairway usage, the sensible plan is to make one or more trial applications on not to exceed one acre plots and be guided by results.

Pre-Germination Promising

Pre-germination of seed prior to seeding has been promising and seems like a good way to hasten turf coverage with slow to germinate grasses like blue grass and fescue. As a result of fine results obtained by C. R. Keeley at Cartier Stadium Notre Dame University, when the field was renovated in 1955, the same procedure was adopted by Colonel R. P. Reed, Jr., when he seeded the field at Michie Stadium at the U. S. Military Academy. The seed used was equal parts Merion and Kentucky bluegrass. It was mixed with twice its volume of Vermiculite and kept moist for about five days at a 70 deg. F. Seedlings appeared within four days and there was coverage in less than a month's time. The field was playable by September and was used for all games on the home schedule.

One supt. in Connecticut used pre-germinated Merion bluegrass seed on a new nursery planting. Results were excellent. His comment was that he would never again use anything except pre-germinated seed.

Tests were made in Milwaukee by John Voight. One batch of seed was placed in a cloth bag and immersed in lukewarm water for 24 hours. The other lot was mixed with two times its volume of fine ground Vermiculite and kept moist for 96 hours at room temperature. Seed was mixed with Milorganite



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to facilitate handling and was seeded into well fertilized plots of ground. Both methods produced grass quicker than on check plots seeded with ordinary seed from the same lot.

Pre-germination of hulled common Bermudagrass seed is justified in any area where day or night temperatures are apt to be below 75 deg. F. Results at the Military Academy on Squad "C" Field mentioned previously support that contention. A good stand of grass was obtained quickly even though weather was cool — too cold for best results with Bermudagrass seed. Anybody interested in testing seeded Bermudagrass for temporary summer cover in the North should use pre-germinated seed.

Moisture Important Factor

For best results with any type seed it is best to mix the seed with two to three times its volume of fine ground Vermiculite, keeping mixture moist for four to five days at a temperature of about 70 deg. F. Then it should be mixed with three to four times its volume of sewage sludge fertilizer or similar material, to dry the mix — just before seeding. Contact of seed with soil is important and can be achieved by seeding with a disc seeder or by light rolling. Surface soil must be continuously damp or moist until the new seedlings become established. The use of pre-germinated seed seems like questionable practice on areas where water is not available. The young grass sprout dries. Then it withers and dies. If attempted in an experimental way on unwatered plots of small size, the pre-germinated seed should be covered lightly, first with soil and then with straw. Evidence up to now is against pre-germination unless water is available to insure rapid growth.

Pre-germination of quick germinating seeds such as the rye grasses and the bents hardly seems justified. Usually seedlings appear within a week's time, or sometimes less. Soaking seed over night is worth trying, but there would be no saving in time with the Vermiculite method. The only advantage might be in a spell of cool weather. Even that would seem like a remote possibility.

Iron chlorosis on greens continued to plague many supts. Those who learned to recognize symptoms and applied a little iron promptly did not lose turf. Others did, and blamed leaf spot or some other disease instead of recognizing the underlying cause. Iron chlorosis is aggravated by high pH, excessive amounts of soil phosphorus and by overwetness associated with high organic content of soil.

The best way to stop iron chlorosis quickly is to rely upon absorption through the leaves. It is the one time where foliar feeding is justified. Fortunately very little iron is needed, otherwise the chemical would burn the foliage due to the necessity of using a small quantity of water — just enough to deposit the iron on the surface of the leaf.

The amount of copperas (ferrous sulphate) need not exceed 2 ozs. per 1,000 sq. ft. The amount of water should be about 5 gals. per 1,000, or approximately 25 to 30 gals. on the average size green. Late afternoon is a good time to spray. Watering-in afterwards will nullify the beneficial effect of the iron.

The new chelated forms of iron stop chlorosis, but lasting effects have been disappointing. In that respect they have been no better than ferrous sulphate on plots in Colorado. Up to now these materials have not performed on grass like they have on citrus in Florida. Until one is developed that will persist, the supt. is forced to rely on foliar feeding with ferrous sulphate. This is much less expensive. In Colorado good results have been obtained with ferrous ammonium sulphate, which is readily available there as a by-product in the recovery of rare earth metals. It contains 7 percent nitrogen in the ammonia form in addition to soluble iron. Burning is more apt to occur with it than with ferrous sulphate. That is the report of several supts. who tried the ferrous ammonium sulphate on fairways. There is very little point in using iron on fairway turf except possibly in semi-arid regions where soil reaction is very high — in the range approaching pH 7.8 to pH 8.0 or above.

A question has been raised about the continuous use of iron. Some think the cumulative effect may be bad. Most soils contain 5 per cent or more of iron, or 100,000 lbs. per acre to the plow depth. The 2-oz. rate is equivalent to 5 lbs. per acre, or about half that amount of actual iron. On that basis harm to grass from the use of iron seems unlikely. The British have used "Lawn Sand" for many years. It is a mixture of ammonium sulphate and ferrous sulphate in dry sand. Some of our fungicides contain iron as ferrous sulphate or as a chelate.

Thatch or mat is still troublesome and on the increase some places. Infrequent mowing, scalping rollers, and less frequent top-dressing are commonly blamed. In the spring of 1956 one club fertilized heavily after good growth had started. Then the green was aerified in four directions. The Verti-cut was used to break up the cores and was followed with a flexible steel mat. Mowing came next and was followed by a light topdressing of about 1/2 yd. to the green. Recovery was very rapid — in about one week. The green took water better all summer and localized dry spots were not troublesome.

"Perfect" Course

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"One eyesore ruins an otherwise perfect picture," says the Tulsa supt. "And, by the same token, sprinklers that interfere with play, shelters with roofs that are leaky