



A comparison between a creeping bent (top) and Highland bentgrass (lower) shows there is less tendency with Highland to produce the long trailing stems that root out at the joints and weave troublesome thatch quickly.

out bentgrass inclusions).

You can accept this reasoning or not. But in any event, as we shall see, I believe the logic of the argument applies more to the lawn than the fairway. Even for the law, it's questionable. So far, in our tests on the Lawn Institute grounds, we have failed to see any of the select varieties of bentgrass, particularly the work-horse Highland variety, become a pest in bluegrass turf. As a matter of fact, bluegrass has tended more to invade Highland bentgrass than vice versa.

One of the reasons bentgrass mixed with bluegrass-fine fescue has sometimes been frowned upon, is that the ultimate turf is viewed solely as a bluegrass-fescue population. Bentgrass is the ill-represented minority. If an off-type gets started, or volunteer creeping sorts become naturalized, making colonies or patches of contrasting color and texture in the turf, these are understandably viewed as discordant in a bluegrass matrix. In our plantings with Highland, I haven't seen this happen to any great degree, but nonetheless you can see how it might where bentgrass has naturalized widely. But on the modern fairway, where the pros demand half-inch mowing, you're looking at exactly the reverse

side of this coin. Bentgrass becomes the base population.

The question, then, is: Are the bluegrasses and fine fescues making discordant patches in bentgrass turf? Happily, it's just not the nature of Kentucky bluegrass and fine fescues to be so ungentlemanly, especially at half-inch mowing, and under irrigation!

Our premise is that today's fairway is essentially bentgrass environment. The close mowing precludes reliably dense and weed-free bluegrass-fescue. But that does not mean bluegrass-fescue has no place. Rather than avoiding mixtures that combine these stalwarts, why not view fairway seeding as a bentgrass planting that is supported by bluegrass and fescue? The lawnsman's approach is bluegrass-fine fescue into which bentgrass is introduced. There is a great deal of difference. In the former, management is oriented to bentgrass needs; in the latter, of course, to the bluegrass-fescue. Although lawn advisories may overlook this distinction, today's superintendent cannot, for modern demands make the fairway essentially a bentgrass environment. Slight adjustments in the mowing, feeding and weeding schedule are all that is needed to accommodate a colonial

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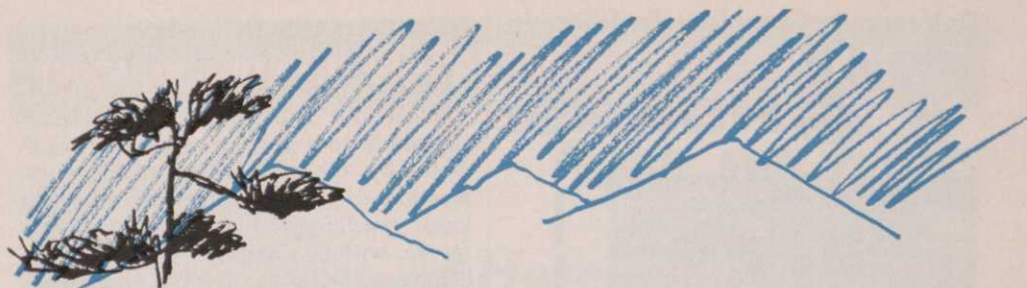
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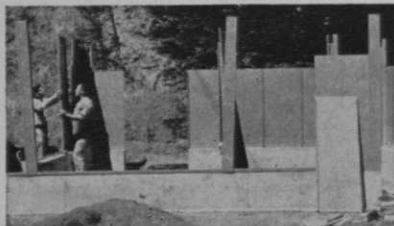
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BENTGRASS BLENDS

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bentgrass on an irrigated fairway.

What can fine fescue and bluegrass contribute to a seeding of colonial bent? Naturally, the performance of any combination of grasses varies according to local conditions. But surely the fine fescue, with its comparatively large seed, helps establish cover quickly, while bentgrass goes through its slow early phase of growth. If a little bluegrass is there too, additional density should result.

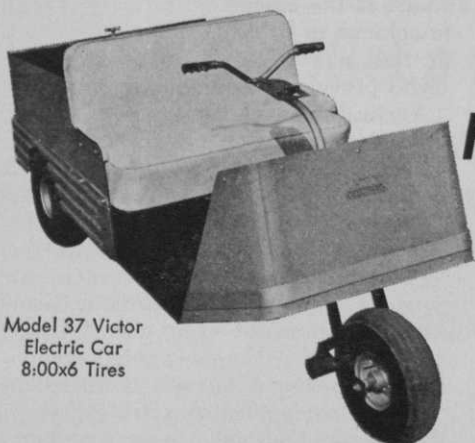
In our tests at the Lawn Institute, seedings which have combined modest percentages of bluegrass, or fine fescue with Highland bentgrass, show dwarfed plants of these species continuing to stay alive. They contribute seasonally to the attractiveness of the turf. This in spite of maintenance adjusted entirely to favor the bentgrass, that is, frequent close mowing at a half-inch or less, regular watering, and generous fertilization—practices that in theory give bentgrass every advantage. I won't say that our experience applies everywhere. But I think it's worth considering whether a modest percentage of fine fescue, say in a colonial seeding, doesn't have merit.

The fescue (and bluegrass) contribution may be solely in the initial year, these grasses disappearing subsequently; but even so, isn't this worth the additional assurance of a good initial stand? Seedings made by professionals in the heart of "bentgrass country," such as the western slopes in Washington, frequently are of equal parts (by weight) of a fine fescue and a colonial bentgrass. By seed count this means 10 times as many bentgrass seeds as fine fescues, since bentgrass runs in the neighborhood of seven million per pound, fescues considerably less than a million.

The economy of seeding as contrasted to vegetative planting hardly needs comment in this age of high-priced and difficult-to-find labor. The cost of the seed is inconsequential compared to investment in time and facility required to get a golf course on stream on schedule. So there's really no good substitute for seeding of fairways over the northern two-thirds of the nation. Soil cultivation

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BENTGRASS BLENDS

Continued from page 91

with tractor equipment, followed by fertilization and leveling with other machinery, is all that is needed. With the trend strongly towards underground irrigation facilities on the fairway, achieving good germination is now less a problem, even without mulch (although a mulch, such as clean straw, or one of the newer slurries, that can be blown or sprayed over acres with the modern hydroseeders, are added insurance). A slightly rough or pebbled soil surface provides good lodging sites for the seed, and will not slake or crust readily.

Even after the course is in operation, threadbare turf can be strengthened by bolster seeding without soil cultivation. Bolster seeding is usually suggested for autumn. But winter or early spring seedings find the seed working down nicely into frost pits as the soil freezes and thaws. The implanted seed is ready to sprout when warm weather comes. Seed is relatively so inexpensive compared to other demands for maintaining

a golf course, that bolster seeding insurance makes sense. Might as well have candidate grass seeds in the soil; otherwise weeds will almost surely fill the voids! If the equipment is good enough to achieve so light a seeding, 20 pounds to the acre of a Highland bentgrass blend provide a good seed reserve.

Vertical mowing and thatch removal are being increasingly practiced on the well-kept golf course. Bolster seeding in conjunction with such practices makes good sense, too. Vertical mowing and aerification scratch the soil surface, letting seed reach soil rather than remain perched atop the thatch where it cannot sprout. One might even regard bolster seeding as a taken-for-granted complement to seasonal fairway de-thatching.

There are no better grass experts in the country than golf course superintendents, for whom success with grass spells livelihood. I'm not suggesting that successful practices be abandoned. But it does seem time for someone to say a kind word in behalf of bentgrass blends for the fairway, in case some of the lawn advisories have been misinterpreted. •

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Irrigation a la carte

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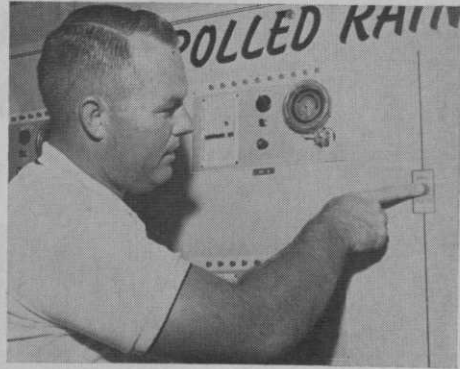
By HERMAN R. JOHNSON

Superintendent, Quail Creek C.&C.C.,
Oklahoma City, Oklahoma

When Jim Latham called me, I had just walked into the office from an inspection of my irrigation system. He asked if I would talk to you concerning "Modern Irrigation Design." I thought of the many times in past years that I had told my waterman to water a certain way, then went back later to find he had overwatered one nine, underwatered the other nine and stuck the pick-up in the middle of a tee while changing sprinklers. So, I decided that if I could help any club obtain a properly designed automatic irrigation system, then surely I could talk about it for a while.

I would like to begin with a demonstration of what the acetone test actually does to plastic pipe. In containers holding anhydrous acetone I place samples of PVC pipe, all coming from well-known manufacturers. The acetone test determines the extrusion quality of the pipe. Any pipe that won't pass at least a 30 minute test is considered inferior. I would recommend that pipe pass a two-hour test.

Modern irrigation system design means "automatic" to me. There are several ways in which you can get an automatic system. Your green chairman can decide that you should have one, you can obtain reliable information and prove to



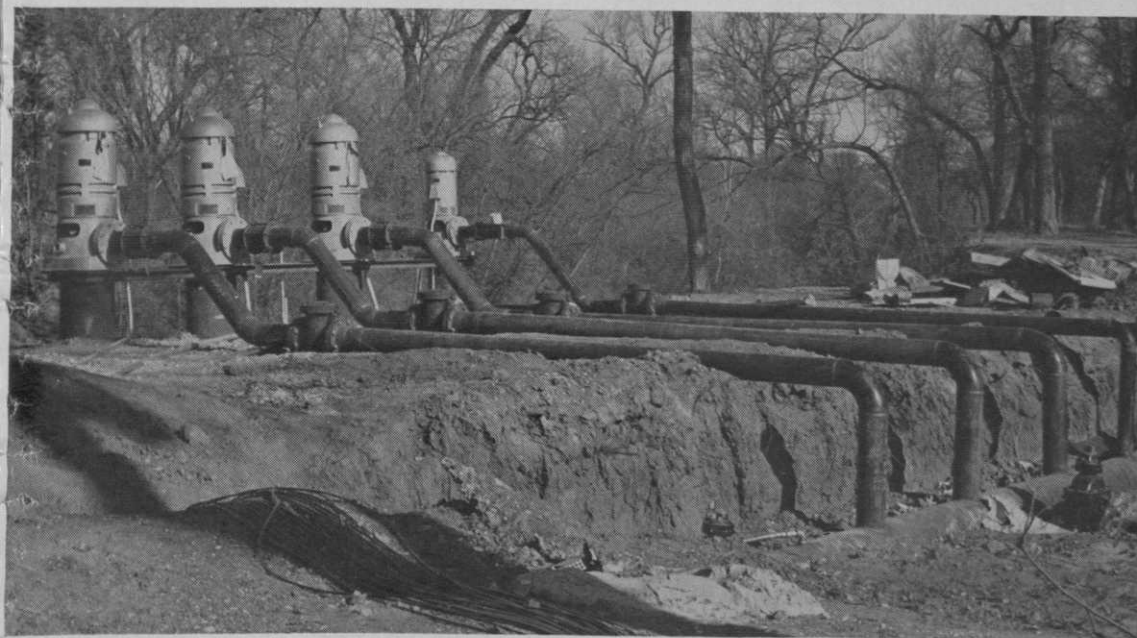
Herman R. Johnson

your club you need one or you can let someone come in and sell your club a system. I don't know which will happen to you and your course, but if you continue in the turf field, you will be involved with automatic irrigation sooner than you think. I have seen many automatic systems installed in the last few years and at least 50 per cent of those I have seen are not satisfactory.

It is likely that some superintendents might say they don't need an automatic irrigation system. It could be true, but some of them could also get by with the old hand-push mower. I'm sure that when they began to motorize greens mowers, some golfers and superintendents didn't want them because one might leak a few drops of gasoline on the green, streak with a little grease on the roller, cause excess compaction, due to the excess weight of the motor, or extra noise might not be desirable. Automatic irrigation has kindred problems.

Some irrigation system problems might be excess water in the sand traps, watering too heavily in one area and leaving voids or dry spots in other areas or accidentally turning on the wrong valve and soaking the club president's wife while she is putting on the 12th green.

Automation is wonderful if properly



Heart of the system.

engineered, properly installed, properly operated, and it operates properly. The key to knowing when your system is working properly is when you can go to bed at night and not even think about it until the next morning when you arrive at work. The first time I operated an automatic system, I got up twice during the night just to see if everything was all right.

I would like to explain how we at Quail Creek decided upon an automatic system and why we chose our system. The first decision made was that Quail Creek had a two-year-old golf course with an expensive and new manual irrigation system that would not do the job. Labor, to keep the course watered only to a minimum, cost over \$10,000 per year, not counting the labor required to repair from two to five leaks a week.

This sounds like a lot of leaks and it is, especially since a leak generally costs from \$35 to \$50 to repair. One of the main causes was that there weren't any swing joints in the system. The quick couplers were connected directly to the

main lines without any type of swing joint and cemented connections were used. On some of the asbestos cement lines, two street ells were screwed into each other, forming a swing joint that would move very little. Naturally, when even the lightest equipment ran over a quick coupler, it would break, especially if it were cold. When we began to remove the old quick couplers, I sent two men out and by hitting the plastic riser underneath the quick couplers with a pick, they were able to remove all 300 within four hours.

September 15, 1963 I was asked to visit Quail Creek and design a system for the course. Checks were made with neighboring superintendents concerning weather conditions as well as other peculiarities that are found at each course. No two courses ever present precisely the same problems.

There are differences in soil, terrain, maintenance background and possibly most important, the type of course demanded by the members. After these determinations were made, I decided upon

Continued on page 102

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