

is slower than the tractor direct, as the stump puller is not mobile while pulling and therefore can not move the stumps any distance.

Burning the stumps is often the only way to get rid of them. If you have a big pit in which you can roll them you are fortunate, otherwise a pulley arrangement to hoist them into piles for burning is a great aid. It is an endless task to burn scattered stumps. The stumps must be piled high so that a fire of intense heat will develop. The pulley should be attached to a cable between two high trees, or near the top of one very strong tree. The trees used as the boom of a derrick should be trees that are to be removed as they probably will be badly burned. After passing through the pulley, one end of the cable should be attached to the power unit. The other end will of course be attached to one or more stumps. The stumps can be quickly hoisted and dropped, making a compact pile of almost any size.

Sometimes a club has a steam shovel at work constructing greens, etc. If so, it can be used to advantage in loading and piling stumps. By passing a chain around the stump and looping one end over a tooth of the bucket the stump may be hoisted easily.

Local conditions of course affect this kind of work, more so as to cost than as to the method; so without giving figures, it is hoped that the outline of clearing methods discussed will either in whole or in part prove of assistance to those who have clearing to do on golf course property.

Bent Putting Greens in California

By Norman Macbeth, Wilshire Country Club, Los Angeles, Calif.

Although asked several times during the last two or three years to express an opinion about bent grasses for putting greens, I was disinclined to do so until comparisons could be made of greens which had gone through at least two summers and winters. Such comparisons can now be made.

As I am not at all expert in identifying different grasses, having little or no more knowledge of them than the average chairman of a club green committee, it might seem indelicate to name golf courses whose putting greens are commented upon; but an opinion is hardly worth writing unless it can be related by those who read it to putting greens they have also played upon. My opinions will, therefore, be given without any hesitation about naming golf courses.

Creeping Bent Vegetatively Planted

Inverness Strain.—Olympic Club, San Francisco, planted, I believe, in 1924. The grass is light-green in color and has an extreme tendency to develop a downhill grain and a fluffy condition of the turf. The greens require constant ruffling with wire brushes and mowing to counteract the tendency to grain, also frequent topdressing. The greens lose color in cold weather. They are susceptible to dollar brown-patch. The greens are a decided improvement upon the mixed grass greens previously aimed at as a general rule in the San Francisco district. The maintenance costs are probably not any less, because of the necessity for frequent brushings and topdressing, than those of the old greens of mixed grasses which required systematic weeding and reseeding.

The Inverness strain of bent grass was also used in putting greens on the Del Monte Course, and in Southern California on the courses at Santa Ana, Palos Verdes, and California Country Club in Los Angeles. Very much the same comments could be made in all cases. The Del Monte greens are being changed to a strain of seaside bent (*Agrostis maritima*), seed of which was produced in the Coos Bay region of Oregon.

Washington Strain.—Bent grass of the Washington strain has been planted in putting greens on Los Angeles courses at Hollywood Country Club, Griffith Park Municipal course, Oakmont Country Club, and on the Long Beach Municipal course. Most of these greens were made in 1925 and 1926. They are a glauca-blue color and were rather coarse the first year, but fined down considerably later. These grasses have a thick and compact turf which is superior, in my opinion, to that obtained with the Inverness strain. They show a good resistance to dollar brown-patch. The faults are tendencies to develop downhill grains, and to becoming too cushiony unless very frequently cut and topdressed. They go off color decidedly in cold weather.

Metropolitan Strain.—The grasses used here under this name are bright blue in color, and are of finer texture than Washington or Inverness. The greens require equally frequent brushing, cutting and topdressing, but do not develop a grain to anything like the same extent. At Lakeside Country Club, in Los Angeles, the greens were all made of grass sold as Metropolitan bent, and for two years they have been in perfect condition. They keep their color well in cold weather, and although the greens are undulating there is no variation of texture or putting speed between the high and low spots. The soil and the drainage of the greens are both ideal, and much better than could be expected on most courses. This advantage, coupled with the rather expensive upkeep given them, probably accounts for an absence of attempts to duplicate these greens on other local courses. This strain is, judging by reports, very resistant to brown-patch.

The grass being sold now locally as Metropolitan bent is apparently a mixture of two or more strains, which can be seen in the putting greens made early in 1927 at Virginia Country Club, in Long Beach. The effect in winter with two strains is a mottled appearance of the surface, which makes it somewhat hard to judge the putting speed even though the turf is fairly uniform in texture.

Metropolitan bent I consider superior for use in California to either Washington or Inverness strains as developed from 1925 to 1927.

Probably the best creeping bent yet grown vegetatively in Southern California was sent from the Arlington Farm Gardens, Washington, D. C. It came to the Hillcrest Country Club in Los Angeles in 1923 or 1924 for experimental purposes, and unfortunately it lost its identification tag. The turf was developed by Hillcrest Country Club in a nursery kept under putting green conditions, and in 1926 was laid over the old greens. The turf was about 10 months old when moved, of firm texture and bright green in color. The stolons are short and the nodes close together. These greens were topdressed for the second time this year in June, which was quite a saving in expense as compared with other bents in the district. They need close cutting

practically every day in the growing season or they tend to become cushiony, but at no time have they shown signs of graining. They are apparently highly resistant to dollar brown-patch, and keep their color well in cold weather. This turf is now about two years old.

Seaside Bent:* Seeded Greens

Seaside Bent (Agrostis maritima).—The La Cumbre Golf course in Santa Barbara was, I think, the first in California upon which this seed was used. The greens are now almost three years old, and have been in excellent condition throughout almost that entire time. Since then most of the new greens made in the Los Angeles district have been seeded to seaside bent, including the courses at El Caballero, St. Andrews, Bell Air, Riviera, Brentwood, Royal Palms, Parkridge, El Serreno, Sunset Fields, and Fox Hills. These were all new greens, some being seeded to seaside bent only and some to seaside bent mixed with redtop or *Poa trivialis* and Colonial bent.

Where greens are established with seed the first cost is considerably less than vegetative planting, and the maintenance is also less. It makes a turf of fine texture, and light blue-green in color. It may develop a grain in its early stages if not cut closely and brushed, but it does not develop a cushion. It is not so resistant to dollar brown-patch as Metropolitan but keeps its color well in cold weather.

Some greens of seaside bent which are two years old have never required brushing. They require about the same amount of top-dressing as mixed grass greens, and they stand wear well.

The introduction of bent grasses into California marked a distinct advance in putting green turfs, both in the way of better putting and cheaper upkeep. The golf courses built within the last three years have vastly better greens than those at most of the older clubs, but as seaside bent is so easily sown into old greens and so quickly dominates such varieties as bluegrass, redtop and fescue, it will not be long until there will be no excuse for a California course being without excellent putting greens throughout most of the 12 months of every year.

NOTE.—From the description of the appearance and behavior of what is here mentioned as the Washington strain of creeping bent there is some doubt of its being what we recognize as Washington bent which, as we know it, has no more tendency to develop a grainy structure than Metropolitan bent, and is of a bright green, rather than glauca-blue color. The grass used on the greens of the Hillcrest Country Club are more like Washington bent, and our records show that some stolons of the strain were sent that club in 1924.

A Correction

We wish to call attention to the last paragraph in the article entitled, "Further Experiments in the Control of Japanese Beetle Grubs," by Mr. B. R. Leach, in the February issue of THE BULLETIN. This statement was intended as an editorial comment but through an oversight appeared as though written by Mr. Leach. While it is recognized that lead arsenate is a standardized product it seemed advisable to issue a word of warning as a safeguard to those unaccustomed to buying arsenicals.

* The seed of the seaside bent here referred to was produced in the Coos Bay region of Oregon and purchased under the trade name of Cocos bent. This name is registered in the United States Patent Office and is therefore subject to certain restrictions as regards its general use.