

mous quantities" of sand to materially affect its porosity. There must be enough sand so that sand particles are continuous and completely surround the clay particles. Yet, it may take only 8 to 10 per cent of a heavy clay soil to completely change the characteristics of a sand.

**Q — When we speak of "sand" what do we mean? Isn't there a big difference in sands? (Ohio)**

A — There is a very great difference among "sands." To understand sand consult a book on soils where official sizes of sand particles are designated. Musser's *Turf Management* discusses this subject thoroughly. A very fine sand (i.e. "blow sand") can be more difficult to handle than a clay soil. "Coarse sand" usually is specified in mixtures for putting green construction.

Percentages of sand to produce a "sandy loam" are well outlined and illustrated in textbooks on soils. Write to your Agricultural Experiment Station Soils dept. and ask for publications that apply to your problem of creating a desirable porous loamy mixture for putting green construction, using available local materials.

**Q — We have three "saucer" greens which will not drain. Can you suggest any way to improve the situation? (Ind.)**

A — You might try drilling holes 6 to 8-ft. deep with a post-hole auger and back-fill with fine gravel to provide drainage wells. This has worked very well in a number of cases. Frequent aerifying and top-dressing with sandy material will aid drainage. By all means, reduce watering to a minimum, consistent with good grass growth. Hand watering is recommended "only as needed."

**Q — Overseeding common bermuda with ryegrass on our athletic fields is not alto-**

**gether satisfactory in keeping green color. Would we do better to dye the bermuda green? (Ala.)**

A — Common seeded bermuda is not a grass I would recommend because of its loose open structure and rapid loss of color. I would hesitate to advise use of dye on it until we have better dyes that last longer and do not turn a sickly yellow in the hot sun. Improved strains of bermuda which produce denser, finer turf and keep color longer might be the answer. Also, you might try overseeding with Kentucky 31. It's deeper-rooted and less slippery than ryegrass.

**Q — Goosegrass in our Seaside bent greens is a recurring problem. Can you suggest any way to eliminate it? (Ill.)**

A — Start sterilizing topdressing material at once. Thoroughly mix 13 lbs. of granular calcium cyanamide with each cu. yd. of mixed topdressing. (There are 21 bu. in each cu. yd.). Have topdressing moist but not wet. Pile it in bin and let stand for 2 to 3 months. Weed seeds will be killed. Unsterilized topdressing often is a cause of weed infestation.

Seaside bent is about the poorest creeping bent. I would recommend changing to a better grass. Arlington and Congressional mixed are good. Pennlu is rated even better. Goosegrass has difficulty getting a foothold in vigorous, aggressive grass.

Aerify only during the active growing season when grass is growing vigorously, so it can heal holes quickly. Vertical mowing every Monday morning, to nip off goosegrass leaves and stems and the runners of the bent, will help.

When you see goosegrass starting (probably late June or early July) try di-sodium methyl arsonate, according to manufacturer's instructions. Young plants will be easier to control than mature ones. Fertilize generously during spring and early summer. Dense, vigorous turf is good insurance against weeds. Keep insects and disease completely under control.

If goosegrass does return, don't waste time and ruin the putting surface by digging with knives. Chemicals and vertical mowing will maintain a smooth putting surface.

**Q — We plan to fertilize and seed fairways this spring. How much fertilizer should we use and what type of seed do you recommend? (Mo.)**

A — The best grass for fairways in your poor, gravelly soils is a good strain of bermudagrass which should be planted in

### **Club Manufacturers Report 3,941,206 Sold Last Year**

Henry P. Cowen, pres., The National Association of Golf Club Manufacturers, advises that the organization's members reported 3,941,206 clubs sold from Nov. 1, 1954 to Oct. 31, 1955. Of the total, 2,746,591 were irons and 1,194,615 were woods.

The 1954-55 total surpassed 1953-54 figures by three per cent. Totals for the latter 12-month period were 3,826,580 clubs sold. These included 2,658,262 irons and 1,168,318 woods.

spring from sprigs or runners, not seed. Most economical method is to buy planting stock of good strains, grow them in a nursery and plant fairways with fresh sprigs under most nearly ideal conditions.

Strains of bermuda to start in your nursery should include U-3, Ugandagrass and Magennisgrass. After seeding these grasses perform you may choose one of them for your fairways. Or, you may wish to do what I have often done and recommended: mix them together, plant them and let the best ones win.

400 lbs. of 12-12-12 fertilizer to the acre at planting time is the minimum I would suggest. Besides this complete fertilizer, you will need monthly applications of nitrogen fertilizer during the growing season. With sulfate of ammonia, for example, you should apply monthly at least 400 lbs. to the acre during the first season to encourage the grass to cover and spread rapidly so as to reduce weed competition. Other nitrogen fertilizers should be used to supply an equivalent amount of nitrogen (about 80 lbs. to the acre a month) if you do not have sulfate easily available.

**Q** — Several years ago I got a little polycross bent seed. I'm well pleased with the performance but now I can't locate any seed. What happened? (Iowa)

**A** — The small quantity of polycross seed, produced when you got yours, proves that those who prefer to produce greens from seed will be far better off by using polycross seed. This is now known officially as Penncross creeping bent seed. One of the three vegetative parents is Pennlu, along with the numbered strains, 9(38)5 and 11(38)4. Production now is on the increase. Some seed will be produced in 1956, more is expected in 1957. Have patience — and keep right on asking for it.

**Q** — Greens and collars on our course were heavily infested with silver crabgrass this past season. How can we do better next year? (N. J.)

**A** — The silver crabgrass in greens and collars can be greatly subdued in 1956 by following a seven-sided program. There is no surefire control for the pest yet, but these steps will help:

1. Grow the sturdiest, healthiest, deepest-rooted grass on the greens that you can. Thorough aerifying in spring and fall aids in accomplishing this.

2. Exercise rigid control over watering the greens. Keep them as dry as possible — to the point where the players notice that

they are dry. This helps to develop deep sturdy roots. Water by hand early in the morning to wash off the dew.

3. Fertilize adequately.

4. Keep diseases, insects under control with good fungicides and insecticides.

5. When silver crab appears start weekly sprays with di-sodium methyl arsonate. Follow directions on package. Small plants are easier to kill than mature ones.

6. If topdressing is used on the greens be sure that all weed seeds are destroyed by using Cyanamid or methyl bromide fumigation.

7. Are you sure you have a good, vigorous, well-adapted strain of grass on the greens?

**Q** — Is there any bentgrass that is immune to brownpatch and other grass diseases? (Va.)

**A** — The development of a bentgrass which is resistant to brownpatch and other fungus diseases has received a great deal of thought and attention, but to date none has been developed. Some bents are more resistant to some diseases than others. For instance, the new Pennlu creeping bent is quite resistant to most diseases and has given a very satisfactory account of itself in more than six years of testing at Penn State and in more than 20 years of practical use on a putting green at Lulu CC in the Philadelphia area. The new Penncross creeping bent which is produced from seed is relatively resistant to most of the diseases. I doubt that there will ever be a bentgrass developed in our time that is immune to fungus diseases of grasses. The best we can hope for is marked resistance.

The way in which a bentgrass is managed many times has a great deal to do with its resistance to disease. Watering especially is an important factor. Watering bentgrass greens early in the morning minimizes disease. By giving bentgrass only the amount of water it requires disease can be reduced. Many turfgrass diseases are aided and abetted by ill-timed and ill-conceived management practices such as improper watering and fertilizing.

### **Rebuild 20-Year Old Greens?**

It has been the contention of Ruben Hines and many others that when a green becomes 20 years old, it should be rebuilt. A troublesome green should be rebuilt much sooner.