

TREES

TREES FOR ROADSIDE PLANTING. FARMERS' BULLETIN 1482. U. S. Dept. of Agriculture.

TREE SURGERY. FARMERS' BULLETIN 1178. U. S. Dept. of Agriculture.

TURF CULTURE (Maintenance)

TURF FOR GOLF COURSES. Piper and Oakley.

A B C OF TURF CULTURE. Noer.

WATER SUPPLY

FARM PLUMBING. FARMERS' BULLETIN 1426. U. S. Dept. of Agriculture.

FARMSTEAD WATER SUPPLY. FARMERS' BULLETIN 1448. U. S. Dept. of Agriculture.

WEEDS

WEEDS—HOW TO CONTROL THEM. FARMERS' BULLETIN 660. U. S. Dept. of Agriculture.

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MISCELLANEOUS

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ROSES FOR THE HOME. FARMERS' BULLETIN 750. U. S. Dept. of Agriculture.

FLYTRAPS AND THEIR OPERATION. FARMERS' BULLETIN 734. U. S. Dept. of Agriculture.

Research Work Planned in Great Britain

In the February, 1929, issue of *Golf Illustrated* (London), Sir Robert Greig writes on the many changes which have come about in greenkeeping practices during recent years. His observations will no doubt be interesting to readers of the Bulletin and we are therefore quoting freely from his article. It is gratifying to note that the accomplishments of our Green Section are appreciated abroad no less than at home, and that a similar organization has been formed in Great Britain. Sir Robert writes:

“The science or art of greenkeeping is comparatively new. On the older seaside courses almost no greenkeeping was required. If it had been necessary to cut and roll the putting greens there would have been no golf until the mowing machine was invented about fifty years ago, as even the most skilled scytheman could not have mown a putting green. The first effective greenkeepers were the rabbits, and on some courses the rabbits, in spite of their disadvantages, are still excellent mowers. On one course at least the greens rarely require any attention beyond brushing away the rabbit droppings. But even the most hungry and hardworking rabbits were uncertain in their mowing, and some of the old greens were not too good. On one famous course there was a rule that the ball for the drive to the next hole had to be teed on the putting green. Moreover, old Tom Morris

used to say that there should be 'nae puttin',' meaning that the pitch or run up should always be so dead that the putter was not required.

"Times have changed, and a good player wants now to have a reasonable chance to hole a 10-foot putt, a feat which would have been a pure fluke in earlier days. It is a question if we are not making too much of the putting in the interests of the game, but whether we are or not, the demand is for true uniform surfaces, and the convener of the greens committee hears more of his incompetence in the maintenance of putting greens than he does of weedkilling or keeping a good fairway. Very well—if good putting greens are wanted, how are they to be got? Obviously by applying the knowledge that exists and by seeking for more knowledge. A good deal of empirical knowledge does exist in regard to the art of greenkeeping, but it is buried away in a number of hard Scottish and other heads and is difficult to extract, and at present not available to all inquirers. A considerable body of scientific knowledge has been built up by the Golfers' Research Association of America,* and has been added to by Mr. Hackett and others, but here again it is only known to a few enthusiasts who are probably regarded as cranks. The first problem then is to get together the knowledge that does exist and make it available to all. The second problem is by scientific research to add to the existing knowledge and fill up the blanks in our ignorance. This is an operation that will never cease, but there is no reason why it should never begin."

Referring to some of the most obnoxious British turf weeds, Sir Robert continues:

"Why should we not always have a good brassie lie if we have steered a drive to the proper place? It is a matter of grass—the right grass and the absence of weeds and bare patches. It may seem to the ordinary golfer that it should be quite easy to grow grass. So it is, but there is grass and grass, and the grass that makes all flesh is not the grass to play on or to putt on. The grasses that the cow disdains are the grasses that the golfer wants. Moreover the grasses that make a putting green or fairway will grow well only on a suitable soil medium, and that is a medium or soil condition which a farmer tries to avoid.

"There are some courses on heavy clays which can never have the keenness and resilience of seaside turf unless they are resown or re-grown on a new and replaced artificial soil, but even the most difficult subjects are capable of amelioration. It is sometimes said that our present greens are not like the very keen, very fine greens such as those of Gullane or St. Andrews thirty years ago, and that we should try to recover these. But such greens, while suitable for the gutta ball and a limited number of games in a day, would not stand up against modern continuous use, nor would the rubber-cored ball be easy to control on such a surface. It may not be impossible, however, to make a green which will suit the ball of today, and yet be as true and keen as the old ones were supposed to be. But we do not know and we must find out. Our problem is great because golf is played in Great Britain on probably a greater variety of soils and climates and altitudes than in any other country—and what is true of one

* Sir Robert no doubt refers to the United States Golf Association Green Section.—EDITORS.

place is not necessarily true of another. But that only makes the investigation more interesting, and eventually more valuable, and emphasizes the immediate need for research.

"In order to lighten our darkness the Joint Advisory Committee, representing the golf clubs of Great Britain and Ireland, have approved of a scheme for scientific research, and all the National Golf Unions have undertaken to support it. The scheme requires that golfers shall have faith and in the belief that what science has done for industry and every aspect of human life it can do for golf courses; they are asked to subscribe to a research organization. This organization will have two main functions—viz, to collect and summarize and distribute information on the subject of greenkeeping, and in the second place to investigate the problems of greenkeeping, for example, the best grasses, fertilizers, and methods of cultivation and maintenance of greens under dissimilar conditions of soil and climate; the control or elimination of weeds; the control of insect pests which are ruinous to some greens; and any other problems on which greens committees and greenkeepers require information. Judging from the success of the American Golfers' Research Association the small subscriptions required of each club will be many times repaid by the additional pleasure which the game will give when played under better conditions. But golfers must be patient. They must not expect quick returns. Research is slow, but it is very sure, and it pays not in fives and tens but ultimately in hundreds and thousands per cent."

Nobody Can Make It Rain

Some years ago a man went through certain drought-stricken regions in this country contracting to produce an inch or more of rainfall for a consideration of \$1,000 per inch within a period of three months. If the rain came, the fees were collected; if it did not, the man lost nothing. Inasmuch as the average amount of rainfall for each region is accurately recorded, and since precipitation is quite likely to occur naturally after a long drought and within the limits of the record, a shrewd operator is fairly safe in agreeing to "produce" rain.

But according to the Weather Bureau of the United States Department of Agriculture, "rain making" is impossible for any human being. It is quite true that in the laboratory a small amount of moisture can be precipitated by using special equipment, but meteorologists know of no practical scheme for producing rain on a large scale. Widespread drought is due to lack of sufficient moisture in the atmosphere and the absence of other conditions essential to the formation of rain. If there is little moisture to bring down, obviously no device for causing rainfall has any value.

To produce 1 inch of rainfall over an area of an acre, approximately 113 tons of moisture would have to be drawn up into the air and then precipitated. There are 640 acres in a square mile, for which 72,320 tons of moisture would be required. A square mile, however, would be scarcely a dot in the center of any section where drought prevails. Enormous quantities of energy are used in nature to elevate moisture above the earth before it can be precipitated. It takes 5,000,000 to 10,000,000 horsepower-hours to evaporate the water