hole cutter. In this way infection may be checked. The use of Bordeaux when occasion seems to justify the expense and effort, attention to drainage and watering, and the quick removal of the first infected spots, are about the only suggestions for controlling brown-patch that can be given at this time.

Hope in Resistant Strains.

Just as some species are less susceptible than others to the attack of brown-patch, so there are strains of certain species that seem to be much more resistant than others. This is particularly true of the bents, and it is especially encouraging, since the disease is a serious menace to vegetative propagation of these grasses. It is hoped that strains of carpet bent will be found to be highly resistant if not actually immune to the disease. A careful search is now being made for such strains, and if it is successful it will go far toward solving one of the most serious greens prolems.

Power-Mowers for Fairways*

It now seems that greenkeepers in the United States are in a fair way to solve the problem of cutting the grass on fairways. The problem of cutting the rough is still unsettled, and the solution of these problems may effect a radical change in the method and practices now in vogue as to the sowing, fertilizing, and treatment of fairways. Heretofore the efforts of greenkeepers have been directed to the production of turf of dwarf grasses which are easily cut; but it would seem that when the problem of cutting grass has been completely solved, it may be better to use seed of the less expensive grasses, the kinds that grow most readily and thus produce a more luxuriant growth, and then keep it down by proper cutting. When a tractor is developed that will cut all the fairways of a course in a single day of say 10 hours, so that one man can cut the course two or three times a week, there would seem to be no reason why most golf courses should not have a good turf, as fertilizer can be applied until that result is obtained.

It must be remembered that all the cutting units now on the market were designed to be drawn by horses and are neither designed nor built to stand the high speed and rough usage of the tractors whose speeds vary from 4 to 15 miles an hour.

Nothing has been done up to this time but to fit tractors to existing mowing equipment. A great variety of tractor-mowers have come on the market within the last year and are now being tried out with more or less success in different parts of the country; but we are yet a long way from having perfect equipment. It would seem that the study and development of the future should be along the right lines to determine the most effective speed and the speed limits of rotary types of mowers, and that effort should be made to design and construct mowers capable of operation at speeds that are high in comparison with the old horse-drawn equipment. It goes without saying that mowing equipment must be designed with heavier and better gearing, bearings, and automatic lubricating devices; and when the most effective speed limit of the mowing

* The Green Committee expects to prepare a questionnaire covering various phases of this subject, and the answers will be published for the benefit of clubs contemplating the purchase of grass-cutting equipment.

unit is established, obviously a tractor must be worked out with an ample reserve power capable of drawing the mowers at the speed desired. Again, the tractor weight must not be so great as to unduly pack the soil.

It would also seem that the best result may be expected from tractors which push rather than pull the mowers, for the reason that by so doing the grass is cut ahead of the tractor, giving a better appearance to the work; but it may nevertheless be possible to work out something by the use of the caterpillar type of tractor or some other type that would pull the mowers and at the same time leave no tractor marks. It would seem that less power is required to pull than to push a load, and it may be that a tractor developed to pull the mowers will show an advantage in that respect over those which push them.

Mechanical means must be worked out by which the drivers of the tractors can raise or lower the mowers from the driving seat and put them out of gear in crossroads and the like. The tractor must be capable of making a turn around bunkers and so operating without injury to the turf, and it must be capable of working close to the greens so as to minimize the handwork.

The advent of the tractor may bring about new cutting methods. With horse-drawn equipment the common practice is to start at the outside and keep taking inside turns until there is a narrow strip of grass down the middle of the fairway left to be cut. With the tractor, which must take wider turns, the practice is to make the first cut down the middle of the fairway, then turn and go back on an outside edge, and keep making the cuts so that the last cut removes the grass on the far side of the fairway next to the middle. To illustrate: on a fairway running north and south, the first cut would be down the middle, then along the east edge of the fairway; the next cut would be on the west side of the middle, then around the east side again, each cut moving to the west until the last cut, as above stated, takes the western edge of the fairway.

While several of the tractors now on the market are doing very good work on the fairways, none of them appear to be wholly fit on the rough. Of course, it is possible to cut the rough with the rotary type of mower, but if it is so done it must be cut and kept fairly close—too close, in our opinion. It seems to be understood that the rotary type of mower will not work in grass that is over four or five inches in length, and it is therefore to be hoped that some concern will work out a tractor and equipment that can be adapted to the work on both the fairways and the rough. This may possibly be accomplished by having rotary mowing equipment for the fairways and some other type for the rough. The equipment for cutting the rough must be so arranged as to collect and pile up the grass cuttings. The raking of the rough after cutting should be avoided. This can, of course, be done by some sort of a grass catcher, by means of which the grass can be dumped into piles or windrows.

The tractor must be capable of being worked over a wet course. The full value of the tractor will only be realized when it displaces horses, and therefore it must be workable in the spring and fall, when the courses are wet. It also appears that a tractor, to be most serviceable around the golf course, should be so designed that it can be used for other purposes; and if horses are to be displaced entirely the tractor should be capable of pulling or pushing rollers, pulling loaded wagons, and the

like, and it should also be capable of furnishing power to operate saws and do the work now done by stationary gas engines.

In the early stages of the development of the equipment, little attention was paid to economy of operation, and it goes without saying that the most successful tractor will be the one that will operate with the smallest consumption of gasoline and oil and against which the smallest charges for repairs and depreciation must be made; in other words, the successful tractor must not only have the widest utility but be the most economical as to initial costs, operation, and maintenance. The next important step in the development of this equipment, in our opinion, is the redesigning and proper construction of the mowing equipment to stand the speed, use, and abuse that will be called for. Better materials and better construction must be put into the mowing equipment.

The day may not be far off when a horse will be a strange sight on a golf course, but it is not believed that the best type of tractor and mowing equipment will be worked out short of several years of trial and experiment. (Contributed to elicit discussion.)

Questions and Answers

All questions sent to the Green Committee will be answered as promptly as possible in a letter to the writer. The more interesting of these questions, with concise answers, will appear in this column each month. If your experience leads you to disagree with any answer given in this column, it is your privilege and duty to write to the Green Committee.

Keeping Tees in Good Condition

We are indebted to Mr. Walter J. Travis, Garden City, N. Y., for the following helpful suggestions submitted in the way of a comment on the answer to question 10, page 47, of the March 23d number of the BULLETIN.

Your advice makes no allowance for wind or weather conditions; it makes the hole inelastic, and consequently monotonous—unless there are several tees. Even then, definition 4 and rule 2 are dead letters; or else the back part of the tee is useless.

"Grass tees may easily be kept in condition by moving the plates before any sign of wear appears—by starting at the front and working backward, never forward, except the whole length of the tee. Short-hole tees suffer most; but if the divot marks are covered frequently with loam mixed with seed (preferably fescue, which is more wear-resisting than the softer grasses, such as bents), the scalps will heal rapidly and the tee generally be maintained in good condition. A tee is almost as important as a green. If the tees on a course are kept in good shape one may be sure to find the greens well cared for; they are unfailing barometers, as it were."

1. *I have sent you by parcel post today a sample of a fluid which is being sold as an inoculating fluid for soils and seeds, and great things are claimed for it. I would like to have this sample tested and to know what good, if any, it will do to our putting greens and fairways. They claim this is a germ inoculation for either seed or soils. M. S., Iowa.*