

of a big fertilizer factory, to whom I explained my views and scientific reasons for holding them. As the result of this conference my proposals were turned down once more, the main objection raised being that our soil was acid and that what I proposed would make it more so, and finally destroy such turf as we had.

"The recommendations made by the experts were that during the autumn we should lime heavily, and two or three months later apply a heavy dressing of bone meal and finally in the early spring whale meat. This was to be pursued each year until the soil had become sweetened, when we might hope for good turf. I had to content myself by putting on record that if this scheme was carried out we should raise an immense crop of weeds, and that if these were not dealt with most of our turf would be destroyed. To make a long story short all that I had foretold came true, and by the end of the second summer our greens were mere sandy wastes with nothing but an odd patch of turf here and there. On the other hand two abandoned greens which had been left to lapse into fairway had rather improved than otherwise.

"After this disaster I was asked to try my scheme. I said I would do so if given three summers to show results. In the first year I used three tons of iron and ammonium sulfate and two tons of ammonium sulfate on the 18 greens. During the second and third years we used 3 tons to the 18 greens of the same formula. By the end of the first year the bare patches were fast disappearing. During the second year water was laid on and with its help most of the greens were completely healed. The third year has now passed and the club are unanimously of the opinion that our turf has never been better. A satisfactory feature from my point of view is that three of the greens that have not had water owing to impending alterations to the course, and all the tees, have recovered more slowly but quite as well as the watered greens."

Arsenate of Lead as a Beetle, Worm and Weed Eradicator

By Norman L. Mattice, Manager, Pine Valley Golf Club

When I entered the employ of the Pine Valley Golf Club last spring permission was obtained to secure the services of Mr. B. R. Leach, of Riverton, N. J., to act in an advisory capacity to supervise the use and application of arsenate of lead on the tees, fairways, approaches and greens. This chemical was used for the purpose of exterminating the grub of the Japanese beetle, which had done considerable damage to the turf in former years. As planned, the arsenate of lead was mixed in the topdressing at the rate of 5 pounds per cubic yard and spread on 1,000 square feet of area. To date the tees, approaches and greens have been topdressed five times and the fairways once. As a result of carrying out this program the main object of killing beetle grubs was accomplished before any appreciable damage to the turf occurred, and in addition three other beneficial but unlooked for results were obtained as follows:

Many of the greens contained chickweed in large quantities. In one instance, on the old 9th, an effort was made to remove some of the chickweed last year by cutting it out, leaving large patches with

no turf, so that the green has not been in play all summer. After the first application of the prepared topdressing it was noticed that many of the patches of chickweed on all of the greens (including the old 9th) turned yellow and disappeared and the turf came back in its place. After each subsequent topdressing more chickweed disappeared until all of the greens are almost entirely free from it and strong and vigorous turf has taken its place.

During July the beetles began to fly over this part of the country and light on the greens. They immediately began to burrow down into the soil to deposit their eggs, and in doing so little piles resembling worm casts covered the surface of the greens. On closer observation, a full grown, dead beetle was found in each pile of earth. It seems that the soil had been sufficiently poisoned to kill the mature beetle as well as the grub.

After the second topdressing early in May, worm casts disappeared entirely from the topdressed area, which would indicate that worms do not take kindly to soil so poisoned.

Although some crab grass appeared in the surface of the tees, approaches and greens, it did not start to grow until the first of August, and then it did not grow vigorously as is its custom. Other unpoisoned areas developed strong, thrifty crab grass plants late in June, which have already seeded at the time of this writing (September). Employees who have worked for many years on this course state that crab grass on the tees, approaches and greens is not one-tenth as bad as it has been in former years. However, the big decrease in the growth of crab grass can not be attributed wholly to the use of arsenate of lead, for sulfate of ammonia has also been used in every application of topdressing. If the marked effect from the use of arsenate of lead is as great next year as it has been so far this season it is reasonable to believe that weeds of all kinds will be eliminated from the poisoned area and a better and more thrifty turf will result.

Milorganite—An Activated Sludge

By H. L. Westover

For years good stable manure has been highly prized for use on golf courses particularly in a compost pile as it furnishes not only organic matter, an essential to proper bacterial life of the soil, but also some of each of the most essential plant food elements. Unfortunately, the supply around cities has been diminishing rapidly due to the marked decrease in the number of horses and mules. This has been associated with a greater demand not only for manure but also for other fertilizers due to the enormous increase in the number of golf courses during the past few years. The limited supply of stable manure and the high price of commercial products already available has resulted in efforts to utilize all sorts of waste products, particularly those which carry considerable humus and in which the nitrogen is in organic form. In this connection sewage has come in for its share of attention as being a potential source of plant food and organic matter. The use of sewage in its natural state on golf courses is not only unsanitary but the odor is very objectionable to the players. Dried in the usual manner the product is more or less inert