

These fine colloidal particles tend to decrease the size of the drainage channels through the soil and cause them to offer great resistance to water percolation. ImperVIOUSNESS is usually most highly developed in fine textured soils which necessarily have minute interspaces and hence high friction. This condition is usually intensified in the subsoil horizons.

### The Meaning of Flocculation

IT IS well known that colloidal particles such as exist in soils, may be present either in a highly dispersed state where each particle acts as an entity, or, they may exist in clumps or masses made up of a number of individual particles. In this latter case they are said to be flocculated. A soil horizon in which the colloidal particles are flocculated is much more permeable to water than one in the deflocculated condition.

This condition of flocculation depends largely upon the reaction of the soil, an acid reaction causing dispersion or deflocculation. Flocculation may be caused to take place by decreasing the acidity by means of additions of limestone.

Obviously, the decision regarding the proper depth and spacing of drainage lines cannot be made arbitrarily; it must be decided entirely with reference to the character of the particular soil profile involved. The depth, thickness, texture, colloidal content and reaction of the various soil horizons must be taken into consideration. Each soil type has its own individual combination of these characteristics, and the depth and distance apart of the tile lines must be determined accordingly.

## Minnesota Greenkeepers Assn.

THE young and thriving Greenkeepers' Association of Minnesota which was organized April 5 has already issued its booklet containing constitution and by-laws and other information.

The booklet states that there are twenty-six clubs in the Twin Cities district, which includes Saint Paul and Minneapolis. Seventeen of these clubs have already joined the association.

The object of the Minnesota Association shall be to advance the art and science of greenkeeping, to cement the greenkeepers of the state into a closer relationship with each other and the National Association, to collect and disseminate practical knowledge of the problems of greenkeeping with a view to more efficient and economical maintenance of golf courses.

## Eliminating the Compost Pile

Many greenkeepers still wonder whether it is possible to get along without a compost pile. Quite a few others—greenkeepers not tied down by traditions anent the growing of grass, have discovered that it is not only possible to do away with a compost pile but that such procedure is the most effective method of producing a set of uniform, healthy, fine, thick turf greens of a rich shade.

The experience of Grange Alves, pro-greenkeeper at the Acacia Country Club, of the Cleveland, Ohio, district, ought to prove interesting. Alves has done away with the compost pile at Acacia.

All Alves used on the greens at Acacia is Lecco and sand. The sand, free of pebbles and sediment, was used as a top-dressing. The sand is distributed with a Stump & Walter topdresser and rubbed into the turf with cocoanut mat. The Lecco is applied by hand. Alves has been applying sixty pounds of Lecco to a green of five thousand square feet. On a green of nine thousand square feet he has applied eighty pounds.

Another of the conservative greenkeepers, W. H. "Bertie" Way of the Mayfield Country Club, Cleveland, like Alves, has had little use for a compost pile this year. Way has applied fifteen tons of Lecco to the greens and fairways at Mayfield and the course was never in better condition. Mayfield has always been noted not only for its greens but fairways as well. Many give Way credit for being a past master when it comes to fertilization.

The most startling thing Way did was to give the No. 2 green, smallest on the course, one hundred and fifty pounds of Lecco in one hour. That was on July 5. The green at that time was brown in color and Way believed it had gone. In a little over a week this green had come back a richer green than ever. The blades of grass were noticeably finer and the grass in general denser over the whole green.

One of the clubs to discard its compost pile was the Kirtland Country Club, of Willoughby, Ohio. This course is in charge of Arthur Boggs. Like "Bertie" Way, Boggs uses only Lecco and a sandy loam as a topdressing on the greens at Kirtland. Boggs also uses Lecco on his fairways. Another club to eliminate their compost pile is the Pepper Pike Country Club, Cleveland, O.

## Tournament Schedule

- July 26-28—Annual Buckwood Trophy Tournament at the Shawnee C. C., Shawnee-on-Delaware, Pa.
- July 31-Aug. 5—Public Links Championship, Cobbs Creek Course, Philadelphia, Daniel Flaherty, Greenkeeper.
- Aug. 15-18—Buffalo District Amateur Championship, Cherry Hills Country Club, Charles Behm, Greenkeeper.
- August 27-Sept. 1—Western Golf Association Amateur Championship, Bob O'Link Golf Club, Chicago, Ben Freberg, Greenkeeper.
- August 30-31—Walker Cup Matches, Chicago Golf Club, Wheaton, Ill., John MacGregor, Greenkeeper.
- September 10-15—National Amateur Championship, Brae Burn C. C., West Newton, Mass., John Shanahan Greenkeeper.
- September 24-29—Women's National Championship, Virginia Hot Springs Golf and C. C., Virginia Hot Springs, Va.
- October 5-6—Lesley Cup Matches, Winged Foot Golf Club, Mamaroneck, N. Y., John Elliff, Greenkeeper.

Since 1875

## TESTED *Radway's* SEEDS

*We have on spot new crop*  
CHEWINGS FESCUE N. Z.  
BENT GRASS SO. GERMAN  
BLUE GRASS — RED TOP — WHITE CLOVER

*Ask for Sample Offers*

**I. L. RADWANER SEED CO., Inc.**  
115 BROAD STREET NEW YORK  
Phone Bowling Green 3373  
*Seed Importers and Refiners*