

the soda is left in a form capable of neutralizing any acid already existing in the soil.

While the plant also uses the nitrogen of ammonium sulphate and phosphate the residue left in the soil is acid in character. Bone meal tends to decrease acidity because of the lime contained in the mineral portion. Acid phosphate also decreases the acidity of acid soils. In the formation of iron phosphate, previously referred to, the small amount of lime contained in the acid phosphate is released in a form capable of neutralizing the acid in the soil. Acid phosphate has less effect on soil reaction than bone meal, because it contains less lime. Potassium fertilizers increase soluble soil acidity. This is because the residue left, after potassium is taken up by the clay, has acid properties.

Acid producing fertilizers are now generally used on greens, but some factors connected with their use are often overlooked. Heavy soils in particular, possess a remarkable power of resistance to change of reaction and as a consequence repeated applications are necessary to produce the desired results. Sandy soils are more easily changed. The soil or sand used in top-dressing mixtures often contains sufficient lime carbonate to easily overcome the acid producing power of any fertilizer used. Manure contains considerable lime, and when used in large quantities in top-dressing mixtures, tends to decrease soil acidity.

Making Cotton Seed Hull Greens at Parris Island

By SETH WILLIAMS, Lt. Col. U.S.M.C.
President Parris Island Golf Club

CINDERS make the best foundation for cotton seed hull greens. They grip the cotton seed hulls and prevent the green from wrinkling when rolled. Greens can be contoured or stepped at a steeper angle than grass greens. Our greens are all elevated at least a foot in the rear to help hold a pitch; some are made with two steps, some with one and some plain. Those that have two steps are elevated eighteen inches. Where drainage is very good, the front of the green may merge into the fairway. Where the drainage is not good, it is better to make a four inch step so that all the green will be elevated. After a heavy rain our greens are ready

for play within twenty-four hours. They are at their very best after a light rain or sprinkling. Greens may be made fast by constant rolling, or slowed by light sprinkling. Greens are usually made sixty feet in diameter, the front half consisting of a rectangle sixty feet wide and thirty feet deep, the rear half is a half-circle, thirty foot radius.

All cinders are screened through a quarter-inch screen. The cinders that will not pass the screen are used for the bottom layer. This foundation is laid true to the final shape of the green, then rolled with a two hundred pound roller, scattered and re-rolled. It must be packed hard. Next, place two by four inch lumber to make forms fifteen feet wide and two lengths of the green, in the same manner as forms would be laid for a four inch concrete floor. These forms are then filled with the fine cinders, raked and screened with a straight edge across the top of the forms. We leave about a two foot section between the forms and fill and level after the forms are removed. Steps are shaped by hand. This layer is then rolled with a fifty pound roller until footprints will hardly show. This rolling and packing of the cinder foundation is one of the secrets of a good finished green. The green is now ready for the cotton seed hulls.

Forms are again laid, using the two by fours flat. Hulls are distributed and raked and screened so as to make an even layer two inches thick. Forms are removed and the green rolled with a fifty pound roller. Small sections are rolled at a time, care being taken not to step on the unrolled hulls. Men should wear shoes without heels. The green is then sprinkled and re-rolled. This process is repeated again and again. We usually roll a green for three hours the first day, then for two hours a day for a week. Keep the green moist all the time, but not wet enough to pick up the hulls on the roller. The green can be played on after the first week, but needs about a month to reach its best condition. After the first week, use a roller weighing one hundred and fifty pounds until the green reaches good putting condition, then use the fifty pound roller for maintenance.

Greens made as above will hold a pitch shot as well as a good grass green. A pitch shot will take a divot from the green, but this can easily be replaced and firmed with the foot.