

using commercial nitrogen fertilizers, applied frequently in small quantities. The nitrogen in these fertilizers is soluble in water, however, and if applied too heavily, leaches from the soil and is lost.

Experiments conducted on heavy soils in other sections of the country show quite conclusively that nitrogen fertilizers which tend to make the soil more acid, such as sulphate of ammonia, discourage weed growth while encouraging grass growth if not carried to excess.

Our results at the Florida Experiment Station on Norfolk sandy soil over a period of five years have not been conclusive on this point, except that Carpet grass seed germinated much better and made more rapid growth where sulphate of ammonia had been applied several years than following a fertilizer which made the soil less acid. An experiment comparing several nitrogen carrying fertilizers on Bermuda and Italian rye grass was started in 1928 but no conclusions can be drawn at this early date.

From the results obtained at the Florida Experiment Station on lawn fertilization and from many instances observed over the state, it seems advisable to recommend very light applications of potash and phosphate. One or two pounds of muriate or sulphate of potash and four or five pounds of acid phosphate per 1,000 square feet of turf applied once each year should more than take care of the requirements of the grass for these fertilizers. Two or three pounds of nitrate of soda or sulphate of ammonia per 1,000 square feet of turf should be applied each month in order to take care of the nitrogen requirements of the grass. While nitrate of soda or sulphate of ammonia is recommended, many other nitrogen fertilizers give good results. One very satisfactory mixture consists of $\frac{3}{4}$ cottonseed meal and $\frac{1}{4}$ sulphate of ammonia, applied at the rate of 10 or 15 pounds per 1,000 square feet as needed. The effect on the grass lasts much longer than sulphate of ammonia alone, and makes fairway fertilization less of a burden.

Such a mixture never burns the grass; likewise with such a mixture it is doubtful if additional phosphate or potash need be applied as the cottonseed meal contains an ample quantity of both. In this connection it is advisable to apply fertilizers when the grass is dry, and not while wet with dew or rain. It is also advisable to water the grass after applying fertilizer,

particularly if a heavy application is made, as any of the fertilizer adhering to the grass leaves may burn them. This is always true if the grass is wet, when the fertilizer is applied.

All of these fairway grasses will respond to top-dressing with good fertile soil. This consists of covering the grass with one-fourth to one-half inch of good clay loam or compost. By covering surface runners in this manner, increased growth is stimulated, and also much plant food is added in the top-dressing. Many people rely on this method entirely to keep their grass in condition while others rely on fertilizers alone. An occasional top-dressing is very beneficial, and works in very well with the fertilizer program. It should not be necessary to top dress more than once each year if that often.

In the majority of cases, nitrogen alone will take care of this fertilization. Heavy applications of phosphate and potash fertilizers are unnecessary and often hinder rapid growth of lawn grasses. This is particularly true of Centipede grass, and is more noticeable on the lighter soils.

Checking Course Costs on Percentage Basis

ONE of the veteran green-chairmen of the country finds that he and his greenkeeper get the clearest sight of their course costs when the expenses are cast up on a percentage basis.

The percentages for the last two years at this club follow:

	1927	1928
	%	%
Salaries and Wages—		
Greenkeeper .....	.1336	.1265
Labor .....	.5741	.5454
Maintenance of Equipment—		
New parts and repairs....	.0471	.048
Gas, oil, grease.....	.033	.0314
Maintenance Water System—		
Charge for use.....	.0362	.039
Repairs, etc. ....	.....	.0123
Upkeep Supplies—		
Grass seed .....	.0132	.01
Mushroom soil .....	.107	.0632
Other materials .....	.0166	.078
Sundry Supplies—		
Small tools and hardware; flags, cups, poles, etc.;		
paint, lumber, etc. ....	.0156	.0115
Replacements—		
Sand for traps.....	.0208	.0290
Miscellaneous .....	.0028	.0057
	100	100