EFFECTIVENESS OF RENOVATION IN INCREASING YIELDS OF PERMANENT PASTURES IN SOUTHERN WISCONSIN

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THERE has been a notable and significant decline in the productivity of permanent pastures in Wisconsin during the past 30 years. The cumulative effects of diminishing fertility and early and close grazing have been manifested not only in decreased productivity, but in thinning turf, weed encroachment, and extensive injury by the larvae (white grub) of the June beetle, Phyllophaga sp.

The initial research leading to the practical procedure now in effect for establishing legumes in permanent pastures without plowing was begun by Graber (5) in 1925 and reported in 1927. The plan originally visualized the possible extensive use of biennial white blossom sweet clover, melilotus alba, in pasture improvement. Heavy seedlings of scarified and inoculated sweet clover were made on the surface of frozen ground during late winter and early spring when frequent freezing and thawing occurred. Competition from the grass was reduced and soil contacts for the seed were provided at first by previous burning of the old grass residues or by overgrazing. These and subsequent studies by Graber (6, 7) served as the basis for the development of the plan which is now commonly used in improving the productivity of permanent pastures on hilly, erodable land in Wisconsin.

The procedure which is known as pasture renovation is based on the establishment and maintenance of the heat- and drought-tolerant legumes, sweet clover, melilotus alba and M. officinalis, alfalfa, Medicago sativa, and red clover, Trifolium pratense, in the sod of permanent pastures without plowing. The establishment of these legumes is promoted by the restoration of needed fertility and by the preparation of a seedbed by scarification with a disc, spring tooth harrow, or field cultivator. Such tillage serves to retard effectively but not entirely to eliminate the grass component of the sward. In contrast to plowing, scarification with a disc, spring tooth, or field cultivator permits the roots to bind the soil together and this with the broken sods which remain on the surface is very effective in reducing soil losses by erosion even on steep slopes. A somewhat similar procedure for establishing white clover, Trifolium repens, and

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1Contribution No. 187 from the Department of Agronomy, University of Wisconsin, Madison, Wis. Cooperative investigations of the Wisconsin Agricultural Experiment Station, Madison, Wis., and the Lake States Forest Experiment Station, Saint Paul, Minn. Published by permission of the Directors of the Wisconsin Agricultural Experiment Station and the Lake States Forest Experiment Station. Thanks are due H. F. Scholz, Associate Silviculturist, Lake States Forest Experiment Station, and to Professor L. F. Graber, Agronomy Department, University of Wisconsin, for assistance with the study. Received for publication June 14, 1943.

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3Figures in parenthesis refer to "Literature Cited", p. 131.