Of the 5,383,000 acres on farms in Minnesota classified as woodland in the 1935 census on the basis of having value as wood or timber, 77.4% was reported as pastured. In the 25 counties in the southeastern and south central parts of the state where practically all of the country side is in farms 83.4% of the acreage classified as woodland was reported as used for grazing. In the northeastern and north central border counties and in others adjoining them to the south, the percentage of land in farms is relatively low, averaging less than 20.

In these counties there are extensive acreages of cut-over land covered largely with second growth timber and brush and large swamp areas. These areas are largely ungrazed.

Reported yields of pasturage obtained prior to 1937 from permanent woodland pastures in other states were very low as compared with yields from nearby open areas. Observations in permanent pastures in Minnesota appeared to confirm these findings. However, it was thought important to check these observations and in so doing obtain local data which would be useful in the discussion of the management of permanent pastures.

LITERATURE REVIEW

Day and Den Uyl (4) studied natural reproduction in progressive stages of degeneration of farm woodlands due to grazing. They found that where the stands of trees provided less than 50% crown density and a complete grass cover had formed, satisfactory natural regeneration of the trees could not be expected. They concluded that while the grazing value of these woodlands was low, it was probably as great or greater than the anticipated returns from forest products considering the length of time and expenditures necessary to bring areas of this kind back to productive woodland conditions.

Chandler (3) compared prevailing soil and moisture conditions in grazed and ungrazed areas in New York woodlands in the open park and final stages. The amount of light penetrating the forest canopy in the ungrazed areas averaged only 3.03% full sunlight as compared with 21% under the grazed conditions. He found that the organic matter and moisture content of the soil were higher in the ungrazed than in the grazed areas. Air temperature and humidity determined 1 foot above the soil surface and soil temperature taken 1 inch below the soil surface were higher in the grazed than in the ungrazed areas.

Den Uyl and Day (5) during the period 1931–34 grazed yearling steers at the rates 2, 4, and 6 acres per animal in woodlands with about 100 oak and hickory trees ranging from about 2 to 20 inches in diameter. Two acres per animal provided only maintenance rations during the early part of the 1931 and 1932 seasons. The last year, the very dry year of 1934, it was not considered suitable for any grazing. Four acres per animal provided fair gains the first year up to about September 1, the second year only slight gains were made at the beginning of the season, and no gains were made the last two years. Six acres per steer resulted in fair gains up to September 1 the first year and to the middle of August the second year. The third year this area produced only a maintenance ration until about August 1. In the season of severe drought (1934) this area did not provide

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2Associate Agronomist emeritus.
3Figures in parenthesis refer to "Literature Cited", p. 732.