The Production of Tops and Roots by Grass and Sweetclover When Grown in Mixtures

J. L. Schwendiman, A. L. Hafenrichter, and A. G. Law

Sweetclover was used as a green manure in crop rotations at the Washington Agricultural Experiment Station in 1921 and at the Idaho Station in 1923. Results of these trials are summarized (7, 1). Rotations including sweetclover from which soil and water losses were determined began at the Palouse Conservation Experiment Station in 1933 (4). Rotations including sweetclover were used on farms in demonstration projects in 1934 and later in soil conservation districts (9). These rotations have been studied to determine their influence on conservation and the farming enterprise (11). Many of the legume plantings for soil conservation were used as dual-purpose crops. They were utilized for pasture in the late spring and plowed for green manure in the early summer. Grazing trials with sweetclover-grass mixtures have been reported (6).

Early observations of mixtures of grass and sweetclover as compared with sweetclover alone indicated that erosion control was increased, yield of forage was essentially the same as from sweetclover, danger of bloating grazing animals was reduced, and the grain crops that followed the forage in the rotation were less likely to "burn" with mixtures of grass with sweetclover than with sweetclover alone. Two varieties of sweetclover were used in this use. Root measurements were begun in 1942.

Seasonal conditions in the summer-dry climate of the Palouse area vary widely. They were observed to influence the grass-clover relations in mixtures. This report reports yields of tops and roots of the sweetclover and five selected grasses from seedings made in four successive years.

METHODS AND PROCEDURE

Five grasses were planted with sweetclover in each of four successive years at Pullman, Wash. Spanish sweetclover and varieties of mountain brome and slender wheatgrass, used in all plantings (3, 5, 8), were planted from commercial seed. The other grasses were planted from seed. The soil was Palouse silt loam on a typical south slope of 11%. The field had been farmed for 60 years. During a wheat-fallow rotation was followed, but for the last 20 years a wheat-pea rotation was used. Erosion had removed 50—75% of the A horizon. The effects of erosion could be seen in the stand and vigor of the forage crops. Stands and growth was uneven during the first year when the summers were dry. All plantings followed grain stubble plowed and put in Soil Conservation Service land capability Class III. The field had been farmed for 60 years. During a wheat-fallow rotation was followed, but for the last 20 years a wheat-pea rotation was used. Erosion had removed 50—75% of the A horizon. The effects of erosion could be seen in the stand and vigor of the forage crops. Stands and growth was uneven during the first year when the summers were dry. All plantings followed grain stubble plowed and left rough over winter.

Seedings were made in the spring on a firm seedbed in plots 6 by 112 feet. The grass was drilled at right angles to the sweetclover. The rates of seeding were those recommended for mixtures (2). The plots were randomized in three blocks. Seed were planted from seed. The soil was Palouse silt loam on a typical south slope of 11%. The field had been farmed for 60 years. During a wheat-fallow rotation was followed, but for the last 20 years a wheat-pea rotation was used. Erosion had removed 50—75% of the A horizon. The effects of erosion could be seen in the stand and vigor of the forage crops. Stands and growth was uneven during the first year when the summers were dry. All plantings followed grain stubble plowed and left rough over winter.

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