Sweetclover in a Stubble-Mulch System

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Sweetclover has been used for many years as a soil improvement crop along the border of the Corn Belt and the Great Plains. It has met, however, with two objections on the part of farmers. First, it has been considered a moisture depleting plant which may affect the growth of the following crop. Second, many farmers have thought that soil is more erodible after this crop has been grown on the land. To determine whether these objections can be overcome, sweetclover has been under investigation in a stubble-mulch farming system in Nebraska since 1940. It was desirable to learn whether the crop could be so managed in the rotation that protective cover could be maintained on the land practically all the time. The study would therefore need to include the planting of the crop under residue, the undercutting of the crop at various immature stages, and using this material on the surface as protective residue. It would also be necessary to work out methods of handling the mature or dead material after the second year's growth. Since sweetclover residue may be present in large amounts, it presents certain difficulties in preparing seedbeds and planting crops through it. There are also questions of the proper crop sequence that would make the most effective use of the sweetclover residue. The effects of sweetclover residue on nitrification, soil moisture, infiltration, and erosion when the residue was left on the surface were compared with the effects of similar residue when plowed under.

The purposes of this paper are primarily to present procedures that have been evolved for using biennial sweetclover in a stubble-mulch system, and secondarily to give experiences and data that illustrate the advantages and importance of this or some other legume in the practice of conservation farming.

Establishing the Sweetclover

Biennial sweetclover of both white and yellow varieties has been used in these studies. Sweetclover in these tests has usually been seeded on corn land, but in some cases has been seeded after other crops. In either case, it has been important that weeds be prevented from producing excessive amounts of seed during the season before sweetclover is to be planted. If the land is in corn, every effort should be made to keep the land free of weeds. If in stubble, weeds that start after harvest should be killed by mowing or preferably by stubbling before they produce seed.

In preparing the seedbed for sweetclover in the stubble-mulch system, the residue from the previous crop is left on the surface. The residue protects the land from run-off or erosion while the plants are getting started. The seedbed is then compacted with some type of subtiller, or preferably with a treader. The seed may then be drilled or broadcast. A treader with grass seeder attachment was used to cover both kinds of seed. Under each treatment, certain plots have had the residue turned with a lime sower and seeded the alfalfa of the mixture with a grass seeding attachment on a treader, which leaves the residue from the previous crop on the surface. The residue protects the land from run-off or erosion while the plants are getting started. The study would therefore need to work out methods of handling the mature or dead material after the second year's growth. Since sweetclover residue may be present in large amounts, it presents certain difficulties in preparing seedbeds and planting crops through it. There are also questions of the proper crop sequence that would make the most effective use of the sweetclover residue. The effects of sweetclover residue on nitrification, soil moisture, infiltration, and erosion when the residue was left on the surface were compared with the effects of similar residue when plowed under.

Management of Sweetclover Residue

Sweetclover in these studies has been handled by two methods. In one case it has been allowed to produce excessive amounts of seed during the second year growth and then mowed or shaved with a brome with a lime sower and seeded the alfalfa mixture with a grass seeding attachment on a treader, which was used to cover both kinds of seed. In the other case, certain plots have had the residue turned under with a plow for comparison with the mulch system.

If sweetclover is used for green manure and left on the surface to protect the soil, and at the same time to serve as green manure for row crops, it has been grown on the land. To determine whether the crop could be so managed in the rotation that protective cover could be maintained on the land practically all the time, the study would therefore need to include the planting of the crop under residue, the undercutting of the crop at various immature stages, and using this material on the surface as protective residue. It would also be necessary to work out methods of handling the mature or dead material after the second year's growth. Since sweetclover residue may be present in large amounts, it presents certain difficulties in preparing seedbeds and planting crops through it. There are also questions of the proper crop sequence that would make the most effective use of the sweetclover residue. The effects of sweetclover residue on nitrification, soil moisture, infiltration, and erosion when the residue was left on the surface were compared with the effects of similar residue when plowed under.

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