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Adaptation of *Lotus corniculatus* to Muck Soil

Most perennial forage legumes do not survive on muck soils in northern Indiana. However, birdsfoot trefoil, *Lotus corniculatus* L. has been found to survive for many years on the Pinney-Purdue Agricultural Center at Wanatah in northern Indiana. The predominate grass growing in association with birdsfoot trefoil is Kentucky bluegrass, *Poa pratensis* L.

An experiment with birdsfoot trefoil was initiated in August of 1977 on Edwards muck located on the Pinney-Purdue Agricultural Center. The two objectives of the study were: 1) to determine whether late summer seeding of birdsfoot trefoil was feasible and 2) to study the effect of a late fall applied straw mulch on winter survival of birdsfoot trefoil.

The vegetation on the experimental site was a thick sod of Kentucky bluegrass. On August 18, 1977 the sod was thoroughly rototilled, seeded to Empire birdsfoot trefoil at the rate of 5 pounds per acre and immediately irrigated to insure rapid germination. This was the only time the plots were irrigated as rainfall was adequate for rapid establishment. On October 20, 1977 a wheat straw mulch was applied at a thickness of about 2 inches to one-half of the experimental area. Twine was criss-crossed over the mulch to hold it in place. Stand counts taken just prior to applying the mulch indicated a stand density ranging from 6 to 13 plants/0.1m².

On April 6, 1978 the mulch was removed from the mulched plots. New leaves were just beginning to appear on the plants from the unmulched plots. Some new leaves were appearing on the old stems as far as 8 inches from the crowns.

Early spring growth was most rapid from the plants in the unmulched plots. The more rapid spring growth of the plants in the unmulched area was presumed to be due to a higher soil temperature. The spring was usually cold and wet. The unmulched soil being black absorbed more solar energy as opposed to the mulched plots as it was impossible to remove all of the straw mulch.

Later in the spring it was evident that the mulched plots contained more weeds, especially smartweed. The unmulched plots were relatively weed-free and growth of the birdsfoot trefoil plants was definitely superior in the unmulched plots.

All plots were clipped on June 21 but no weights were recorded due to the severe smartweed infestation in the mulched plots.

Data obtained from the plots on August 21, 1978 revealed the following.

	<u>Crowns/0.1m²</u>	<u>Seed pods/plant</u>	<u>Stems/plant</u>
mulched	2.25	5.50	19.00
unmulched	5.25	13.75	93.25

It is apparent from these data that a fall applied straw mulch did not improve winter survival and based on this one year study actually had a detrimental effect. An adjoining experiment with red clover and ladino clover demonstrated that these two species were essentially 100 percent winter-killed where a mulch was not applied.