NOTE

DETERIORATION OF BUR CLOVER SEED UNDER IRRIGATED CONDITIONS

Bur clover, because of its seeding habits, is an excellent winter cover crop when adapted to the particular soil conditions. Normally, it grows best in a well-drained soil. Excellent volunteer stands may be obtained for several years after a crop is permitted to produce considerable seed before being turned under.

In the production of rice in Arkansas it has been found that green manure crops of legumes produce larger yields of rice. The problem involved, however, is to produce economically sufficient green manure to be effective. Bur clover would be an economic source of organic matter if the anaerobic conditions produced by the irrigation of the rice did not decrease too much the longevity of the bur clover seed in relation to its volunteer habits when used as a green manure crop.

In order to test the effect of submerged conditions, seeds of southern bur clover, both hulled and in the bur, and hulled Button bur clover were thoroughly mixed through soil and placed in quart jars and in 2-gallon earthenware jars. The soils were flooded with tap water and maintained in that condition in the greenhouse for the duration of the experiment. At successive monthly intervals for 7 months, a longer period of submergence than would occur in the production of rice, the soil in jars selected at random was washed through a screen which would retain all of the seed and the material left on the screen air dried. The seeds were separated and counted and subjected to a germination test. In the case of the burs the number of burs were first counted and the seed separated from the burs by hand before being subjected to the test. The seeds were also separated from five samples of 100 burs each which were not irrigated to determine the number and viability of the seeds when the experiment was started.

It should be mentioned that the average daily temperature in the greenhouse in all probability was higher than would be encountered under field conditions, although efforts were made to maintain the temperature between 70° and 80° F. This would, of course, tend to increase the rate of any decomposition which might take place, but would not nullify the general conclusions which may be made from the results. Typical results are given in Table 1.

Since the percentage of germination when tested by the standard method was so small, the seeds not germinated after a stated period were given a hot water treatment and placed in the germinator for an additional period. This, according to Casey,1 gives a reliable index to the viability of the seed.

The results show that deterioration took place quite rapidly. This is especially true of the hulled seed of both southern and Button bur. After only one month’s submergence less than 10% of the seed were still in a viable form. While no specific relationship can be noticed