Manure alone gave very little increase over no fertilizer. Lime alone showed slight decrease but this was probably due to uneven stand. Fertilization with potash, phosphate and lime show the biggest increase. Lime and a heavy application of unleached manure would undoubtedly give a good yield.

The differences in results shown in the above three tests point out the importance of making a field test of each deposit of peat in order that intelligent fertilization may be practiced.

**EXPERIMENTAL WORK ON PEAT SOILS**

A. R. Albert.

Experimental work has been under way on the Coddington Experimental farm since 1918. In the following paragraph only a few of the important findings will be discussed.

The rainfall records have been taken at the Coddington Station since 1919 and in August 1921 the temperature station was installed. The rainfall seems to have a fair distribution throughout the season but the last years 1921, 22 and 23 were considerably below the Station normal, yet crops suffered little from drought. The water holding capacity of peat is very high and when in spring the surface soil has once dried out, it takes heavy rains to penetrate to a sufficient depth to benefit the crops. Such rains being an uncertainty, this points to the necessity of securing deep rooting of plants to beneficially by the water stored and also to the importance of getting fertilizers into the moist soil. On the other hand, crops well established and properly nourished will seldom suffer for want of moisture.

Recently the idea has gained ground that there is a need of irrigation. This idea is based on the observations of the browning of certain plants during the later part of the season. This brown,
blotched appearance of crops is due to potash starvation. Experiments on the Station farm with and without fertilizers have shown that on the same soil where potash has been supplied, the crops grew much more thriftily and in consequence have used much larger amounts of water and yet there was no indication of drying up in the plant even in the dry seasons we have had. Some people maintain that it is getting drier every year as evidenced by poorer crops but the fact of the matter is that the small amounts of available potash are being rapidly used and unless potash is added to these soils, conditions will get even "drier" and poorer. Fields which have been manured (and manure is a good potash fertilizer) produce good crops while others apparently no drier but unmanured still seem to be suffering for want of moisture.

Temperature records are of short duration but indicate the danger of frost and emphasize the need for frost resistant crops and the greatest utilization of the short growing season. The frost danger is considerably less on sandy peats wherever they occur. On the west side of the Wisconsin River the growing season seems to be a little longer and corn is a more promising crop.

An experiment with manure, phosphates and potash and also ground limestone which has been run since 1919 indicates that manure alone produces the largest gross return per acre but no farmer on peat soil can hope to cover his land with the amount of manure per acre every four years which is being used in these experimental plots, until he has first produced the roughage for livestock by means of other soil treatments. It is, however, a big mistake to permit the manure to lie in the barnyard around the buildings, thinking that the soil is already too rich. While the soil is very rich in nitrogen, manure
supplies potash and phosphorus as well as nitrogen and it should be used for the sake of its phosphorus and potash, if not the nitrogen. Such experiments have further shown that the largest return per dollar invested in fertilizer is secured through the Muriate of Potash treatment. This statement applies to the first four years but it is probable that phosphate treatment in conjunction with potash will show a better response with longer cropping. Acid phosphate has so far produced no results whatever. Ground limestone has produced very small increases but the data is yet too limited to draw any conclusions. However, it must be remembered that this is what is known as a high lime peat. On peats which are sour, limestone will undoubtedly give good returns, provided potash is also supplied. Rolling with a heavy concrete roller has not been profitable and we may say that once a new breaking has been packed with this heavy roller thereafter the use of the ordinary corrugated roller to firm the seed bed is sufficient but highly important.

While it is quite certain that most farmers are doomed to eventual failure unless they use proper fertilizer, it does not follow that they will reap success if they do use them. There are many other factors that enter into the question of success on these peat soils, many of which are personal factors inherent in the cultivator himself. Some of these are, frost hazards and crop adaptation to soil and climate, plan of rotation, choice of special crops and the crops in rotation, selection of correct varieties of suitable crops method of fertilizer application, proper fertilizer combination, disposal of manure, tillage method, drainage and irrigation, weed control and finally the price of farm produce.