

AGRICULTURAL DEPARTMENT

Edited by C. E. CLARK

Green Manuring No. 12. Cow Peas.

Who has not heard of the cow pea as a hay making and a soil improving plant? And, who has not been let to believe that one-third or more of the nitrogen and other plant food elements found in this plant at maturity, are left in the roots and stubble after the crop is harvested and cured for hay—that is to say—out of every hundred pounds of nitrogen, etc., found in the pea crop at maturity, 33 1-3 lbs. are the roots and stubble?

This was our best information up to a short time ago and even now some of our best agricultural advisers insist on proverbial third of the nitrogen, etc., being left in the underground portion of the plant. Like the old idea of the scouring of the soil on well drained land, some man seems to have guessed at the amount of nitrogen, etc., left in the roots and stubble and hastened to rush his intention into print.

Now a ton of cured peas has, in the whole plant about, 40 pounds of nitrogen. If one-third of this amount were in the roots and stubble we would have left on the soil and in the soil about 14 pounds of available nitrogen per acre in case the acre produced a ton of cowpea hay. This amount of nitrogen is equal to that furnished by 700 pounds of an 8-2-2 fertilizer, a pretty heavy application for most farm crops. This seemed to be rather weighty argument in favor of cutting the vines, feeding them to live stock, and putting the manure back on the land regardless of the fact that the manure from a ton of cow pea hay fed to cattle will cover—well, what part of the acre will it cover?

Our farmers have been acting on this advice for a number of years in the face of the daily decreasing fertility of their lands under this system. Mr. W. A. Marsh, of Union county took this advice literally, sowed oats, cut and removed them, sowed cowpeas on the oat stubble and cut these for hay when mature. This practice was continued till his land would not produce a crop even of peas. Examples could be multiplied where the pea crop has been removed year after year with disastrous results. Indeed, it now seems that the surest method of depleting the fertility of the soil is to remove a crop of cowpea vines from it every year for a few years in succession.

The real explanation of this phenomenon has finally been discovered. In an exhaustive series of tests and experiments conducted by a number of our best experiment stations it has been found that the amount of nitrogen, etc., left in the

roots and stubble of the cowpea plant is not one-third, but about one-tenth of that found in the whole plant. Here seems to be one of the leading factors in the explanation of the running down of average soils by the annual removal of the pea crop. Another, and, perhaps the leading factor, is that all the organic matter is removed from the soil for a series of years by this method and thus all bacterial life is driven from the land which is thereby rendered dead. These dead soils are not necessarily robbed of their mineral plant foods, however, as will be demonstrated by plowing down a cow pea crop or a good crop of rye for a year or two in succession.

One ton of green cow pea vines contains about 5.5 pounds of nitrogen; 2 pounds of phosphate; and 6 pounds of potash. It is an easy matter, on average soil, to get a growth of 12 tons of some one of the rank growing varieties per acre, which will cure up into three tons of hay.

Composition of Green Cow Pea Compared With Composition of Fresh Cow and Horse Manure.

Green Cow Pea Vines, nitrogen 5.4, phosphate 2.0, potash 6.2.

Fresh cow manure, nitrogen 7.6, phosphate 1.6, potash 7.3.

Fresh horse manure, nitrogen 8.7, phosphate 1.9, potash 7.3.

With this yield per acre there would be produced on a ten acre field 120 tons of green pea vines which, if cut to pieces with a sharp disc harrow, plowed under, and thoroughly incorporated with the whole soil stratum, would add to this field about 650 pounds of nitrogen and render available 240 pounds of phosphate and about 750 pounds of potash.

By thus using the pea crop as green manure the farmers gets from the air as much nitrogen in the first ten inches of the soil of his 10-acre field as he would get from 86 tons of manure or from 15 tons of an 8-2-2 fertilizer. He gets as much phosphate rendered available to the succeeding crop as he would get from 150 tons of manure or from 1 1-2 tons of an 8-2-2 fertilizer. The potash thus rendered available is equal to that obtained from over 100 tons of manure or from nearly 19 tons of an 8-2-2 fertilizer. And the humus obtained from this amount of vegetable matter turned into the soil will be sufficient to feed bacterial life from years to come and will add immensely to mechanical conditions and water holding capacity of the land.

The results of having lost sight of the fact that the humus or organic matter content of the soil is

the basis of all successful farming have been appalling not only in North Carolina but over the whole South. Can we afford to reduce the vitality of our lands still further and hope to retain ownership of them? When we have finished this series of articles on feasible methods of soil improvement we expect to take up and outline a condition that is even now settling down like a pall over the farmers of North Carolina.

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