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THE COWPEA AND THE VELVET BEAN AS FERTILIZERS.

(FOR THE GAZETTE)

The following is a summary of Bulletin No. 120 of the Alabama Experiment Station. This Bulletin will be sent to all addresses on our mailing list, and any others who apply for it, addressing their requisites to Alabama Experiment Station, Auburn Ala.

This bulletin records the results of more than fifty experiments conducted at Auburn during the past five years, to ascertain the effect of cowpeas and velvet beans in the improvement of the soil. The amount of soil improvement has been determined by the increase in the yields of cotton, corn, oats, wheat, and sorghum, grown as first, second, third, and fourth crops after the stubble and roots of cowpeas or velvet beans or after vines, stubble and roots of these plants have been plowed under. The basis for determining the increase has been the yield of each crop on plots where no leguminous plant has recently grown. The fertilizing value of the different varieties of cowpeas was with one exception, and increased in proportion to the height of growth.

In the tests there was a slight increase in the yield of corn by plowing cowpea vines very late in the fall than from postponing plowing until April; but it is regarded as generally as best to plow in the vines not more than a few weeks before the next crop is planted.

The average for six varieties showed that when cowpeas were at a suitable stage for mowing 36.6 per cent, and in another case 39 per cent of the dry plant was available for fertilizing uses in stubble, roots and fallen leaves. In the entire growth of cowpeas on one acre there was contained in one case 52.7 pounds of nitrogen, in another 69.8, and in another 87.2, an average of 70.2 pounds of nitrogen per acre, which is equivalent to the nitrogen in 1,003 pounds of cotton seed meal.

In the roots, stubble and fallen leaves on an acre, respectively, 11.65, 16.2, and 31.4 pounds of nitrogen, an average of 19.75 pounds of nitrogen per acre, which is equivalent to that contained in 232 pounds of cotton seed meal.

The average of three tests shows that 28 per cent. of the total nitrogen was contained in the roots, stubble and fallen leaves after the removal of the hay.

The average increase in the yields of succeeding crops was practically identical whether the fertilizer was supplied by cowpeas or by velvet beans. Equal areas of these two plants were of practically equal value for soil improvement.

The word vines is here used as synonymous with the entire plant of the velvet bean, and with the entire crop of the cowpea after the pods are picked.

The increase in the yield of

seed cotton produced in the year immediately following the plowing in of the vines of cowpeas or velvet beans averaged in four tests 567 pounds per acre, worth (at 6 3-4 cents per pound and \$7.50 per ton for seed), \$14.17. The increase in the first cotton crop after the use as fertilizer of the vines of the summer legumes was never less than 32 per cent, and averaged 63 per cent.

In one test with corn the increase in the first crop where velvet bean vines had been plowed in was 81 per cent., or 12.3 bushels worth at least \$6.15 per acre. With oats the average increase from the vines of the summer legumes in three tests averaged 17 bushels per acre, and with wheat the corresponding increase in two tests was 5.65 bushels per acre.

The increase in the yield of sorghum hay after cowpea and velvet bean vines averaged 87 per cent of an average gain of 2.1 tons per acre, worth at \$6.67 per ton, 14.2 cents.

When the vines of the cowpea or velvet bean were utilized as hay and only the roots and stubble employed as fertilizer the increase in the yield per acre of the crop immediately succeeding the stubble was as follows:

208 pounds of seed cotton, or 18 per cent., worth \$5.20 cts.
4.3 bushels of corn, or 32 per cent.
28 bushels of oats or 33.4 per cent.
6.7 bushels of wheat, or 215
2.08 tons of sorghum hay or 57 per cent.

The largest percentage increase from either the vines or stubble of cowpeas or velvet beans was made by wheat and fall sown oats, probably prevented the washing away or leaching out of the fertilizing material in the vines or stubble of the legumes.

Generally on sandy soil these crops most completely utilize the fertilizing value of the legumes which leaves the land unoccupied for the shortest interval. It is inadvisable for legumes to immediately succeed legumes in the rotation of crops, for non-leguminous plants like cotton, corn, the small grains, grasses, etc., make better use of the nitrogen of the fertilizing crop.

The value of the increased product resulting from the use of the entire legumes for fertilizer was greater with cotton and sorghum than with corn, oats, or wheat.

These experiments emphasize the importance of such a rotation of crops as will require a large proportion of the cultivated land of every farm to be devoted to some leguminous plant.

Comparing the fertilizing effect of the vines with that of the stubble of the cowpea and the velvet bean, the excess in the next crop in favor of the vines averaged as follows:

6.6 bushels of corn per acre,

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THE SOUTHERN FARM GAZETTE, STARKVILLE, MISS.

or 49 per cent.
1.5 tons of sorghum hay or 9 per cent.

452 pounds of seed cotton, per acre, or 40 per cent.

With these three crops the average increase in value per acre was \$5.68 greater from vines than from stubble. With oats and wheat the vines of these legumes were not superior to the stubble when the small grain was sown immediately after the legumes matured.

The fertilizing effect of the stubble of the cowpea or velvet bean was very transitory on sandy land, the average increase in the second crop of corn after the stubble being only 1.34 bushels per acre, or 12 per cent, as compared to the yield of a plot that had not borne legumes.

The fertilizing effect of the vines of cowpeas and velvet beans was less transitory than that of the stubble and the increase was 24 to 54 per cent in the second crop, 14 per cent in the third crop, (oats), and the favorable effect was even perceptible in the fourth crop (sorghum grown in the same year as the third). The total increase in the value of the four crops oc-

cupying certain plots during the three years after the plowing under of the vines of cowpeas and velvet beans was \$42.07 per acre, and the annual increase of \$14.32 cents per acre.

On the other hand on very light soil the fertilizing effect of both stubble and vines had practically disappeared within twelve months after the plowing in of the legumes.

Corn as the second crop yielded 14 per cent, or 2.1 bushels after legume vines than after legume stubbles, this representing a value of \$1.05. The permanency of effect of legumes in soil improvement seems to be in proportion to the stiffness of the soil and to the mass of vegetable matter afforded by the legume, and the favorable influence of leguminous vines is not less permanent than stable manure.

J. F. DUGGAR,
Ala. Expt. Station.

Encourage young pigs to eat out of a trough early. Keep the trough sweet and clean. Feed no more than they will eat up. You can wean them at six weeks old.

IT WILL NOT PAY

To wait for the weeds to grow. If we do we must strike blows all the harder to pay for it.

It will not pay to wait till the "old of the moon" to do our work here on earth. The moon is always old—old enough to look out for herself. We must do the same.

It will not pay to try to make a two-forty horse of a ten-minute colt. It isn't in the blood.

It will not pay to work after the day hangs up its lantern and gives you a hint to do the same.

It will not pay to keep the noses of the boys and girls down between the from morning to night. If you try it you will look up some day and find that you are alone.

It is not a paying thing to loose a dollar's worth of life to save ten cents worth of money.

It will not pay to let the bright boy leave home and keep the other one on the farm.

It will not pay to let the good wife have to hunt all around for chips to start the fire.

Every Southern farmer should subscribe for the GAZETTE.