The Influence of Wheat Growing on Soil Fertility.

The Minnesota Experiment Station is conducting a series of experiments for the purpose of demonstrating the influence of continuous wheat growing on the fertility of the soil. These experiments have now been carried on for eight years, and the conclusions reached are summarised in the following statement. It may be pointed out that whilst these conclusions are predicated on the use of clover as the recuperative crop, yet that like results would doubtless be obtained from the use of cow peas, soy beans and vetches, grown in the rotation in the place of clover.

CONCLUSIONS.

1. When wheat was grown continuously upon the same soil for eight years, there was a loss of 1,700 pounds per acre of nitrogen, about 300 pounds being utilized as plant food and 1,400 pounds lost by the decay of the animal and vegetable matter of the soil and the liberation of the nitrogen as gaseous and soluble compounds. During the eight years of continuous wheat cultivation there was a loss of over 21 per cent of the total nitrogen of the soil, equivalent to an annual loss of 175 pounds per acre in addition to that used as plant food.

2. When wheat was grown in rotation with clover and oats, five crops of wheat being removed in eight years, later yields per acre were secured and the total loss of nitrogen from the soil was reduced to 800 pounds or about 450 pounds in excess of that utilized as plant food. When corn was grown with clover and oats in a rotation and farm manure was used, the total loss of nitrogen from the soil, for eight years, was less than 100 pounds in excess of that removed as plant food.

3. When the oats and barley were grown continuously the losses of nitrogen from the soil were nearly as large as when wheat was grown continuously.

4. When corn was grown continuously the loss of nitrogen from the soil was less than half as large as when wheat was grown continuously. When corn is introduced into a rotation of crops, the losses of nitrogen are less than if wheat were grown.

5. When wheat was grown continuously there was an annual loss of over 2,000 pounds per acre of humus due to the fermentation and decay of the animal and vegetable matter of the soil. When wheat was grown in a rotation with clover and oats, no material loss of humus from the soil occurred.

6. The loss of humus changed the physical properties of the soil, causing it to be less retentive of moisture, lighter in color, and heavier in weight per cubic foot. During times of drought, the soil from the continuous wheat cultivated plot contained less water than the soil from the plot which produced wheat in rotation with clover. Humus conserves the moisture of the soil, while the rotation of crops, the use of farm manures, and the growing of clover, conserves the humus of the soil.

7. When bare summer fallowing is practiced, a heavier loss of nitrogen occurs than when wheat is grown continuously. Summer fallowing favors the decay of the humus and the loss of nitrogen. While larger crops of wheat are produced after a year of fallow, this increase is followed by a heavy loss of the total nitrogen of the soil. Summer fallowing rapidly exhausts the soil of its nitrogen.

8. When the nitrogen and humus of the soil were conserved by the rotation of crops and the production of clover, an increase of 20 bushels per acre of corn, and 5.6 bushels of wheat were secured.

9. Wheat is not an exhaustive crop when it is grown in a rotation, but when it is grown continuously the fertility of the soil is impaired. It is not the crop itself that reduces the fertility, but it is the lack of systematic methods of farming which cause the decline of fertility. Old wheat soils readily recuperate when some humus forming materials are returned to the soil. By the rotation of crops, the use of farm manures and the cultivation of clover the heavy losses of nitrogen and humus from the soil can be checked, and larger yields and a better quality of wheat secured.

Agricultural Education.

"Do graduates of agricultural colleges easily secure positions? If so what are some of them, and what salary do they pay?"

So asks a correspondent of the Chicago Rural Voice and Editor Burke answers as follows:

"Our correspondent's question may be answered broadly by the statement that it is doubtful if graduates from any professional or technological school to-day are in such immediate demand at good wages as are graduates from the agricultural colleges of the country. To be more specific, we may say that the Wisconsin College never yet has been able to supply the demand for graduates, especially those from its short course, and we are advised the pay reaches all the way from $40 to $60 a month and board, at the start. Iowa sent thirty-three of its agricultural boys to fine positions at the close of the last school year; Ohio Agricultural College makes the fine record of having now engaged in practical agriculture 80 per cent of its graduates. To be still more specific, we know of one graduate of Cornell who stepped from school into a thousand-a-year job, and who was raised to $1,400 salary the second year; another agricultural student, we are advised, is in charge of China's agricultural educational work at a high salary, and still another purpose. The young man who graduates from an agricultural college, determined to and capable of putting to practical account the knowledge he has acquired, is as certain of a good position as anything on this earth could be."

Some General Observations on Farm Improvement.

Editor of The Progressive Farmer:

Owners of lands cannot be too careful of the soil. The silica and other properties are easily carried off by heavy rains and floods, never to return without great trouble and expense. Deep plowing is only one way to prevent their escape. Side-hill ditching, terracing, and horizontal plowing, with subsoiling, will prevent floods from washing off the soil, and will retain the fertilizers applied or gathered from the rains. Lands properly cared for will produce some crop to shade and enrich themselves if not taken off; when removed, something else should be substituted to prevent barrenness. Good farmers will always have some remunerative crop on every acre of their lands, not only for what they bring in, but for their preservation, a part of which should be plowed under as the cheapest mode of fertilizing.

Stock and poultry raising is made most profitable by allowing the animals and fowls to gather their own food when the lands are dry; besides, they distribute their excrement without cost. To improve the fertility of the lands is a two-edged sword in acquiring wealth; while a part goes into the purse, the remainder is retained in the soil for future use.

Good roads on the farm are as important as elsewhere. But water carriage is generally cheaper than hauling, especially so when most convenient, and as many productive fields lie near streams or canals made for draining, both of which may be utilized and more economical than transporting long distances over steep hills and bad roads. Millions of acres of unimproved swamp or bottom lands in almost every State might and should be made to produce something more profitable than malaria and musqitoes, and one or two men with poles, oars, sails or engines can market produce and lumber at small cost.

Soiling stock on rainy days is better than tramping lands or using dry or concentrated food because more economical.

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Good Money in the Watauga Hay Crop.

Mr. W. W. D. Edmiston, of New River, has a piece of meadow containing only a little more than six acres on which there are twelve stacks of hay that, to put them at a very low estimate, will weigh 2,500 pounds each, or a total of 30,000 pounds on the plot. This hay can be easily cashed in the meadow at $10 per ton, or $150 for the lot. It possibly cost as much as 75 cents per stack to get it up and the remaining $141 are clear profits, or $23 1-3 per acre. If this isn't making money easily, what is?—Boone Democrat.

Dost thou love life? Then do not squander time, for that is the stuff life is made of.—Franklin.

EFFECTS OF FARM MACHINERY ON AGRICULTURE AND CIVILIZATION.

The Essay Which Won the Two-Horse Mowing Machine in the A. and M. College Prize Competion.

BY WALTER W. FINLEY, NORTH WILKESBORO, N. C.

(Concluded from last week.)

After the low state of agriculture during the Middle Ages, we come to the age when inventors began turning their attention to machines to lighten the labor of harvesting; to a time when competition was becoming more fierce, labor more costly, and any saving of time a gain to civilization.

EARLY HARVESTING MACHINES

In 1786 a machine was constructed by William Pitt, of Pendeford, England, which was a header. A cylinder, fitted with rows of comb-like teeth, was placed horizontally on the front part of the frame, and made to revolve by power transmitted to it from the wheels. As the cylinder revolved, the inclined teeth caught the heads of grain and carried them over into the box of the machine. The animal was, of course, attached behind, a characteristic method of hitching in all these early forms, since it was essential that the grain should not be trodden upon, and no one had as yet thought of the side cut.

In 1808 Mr. Salmon, of Woburn, brought ou a machine with several new features, the most important of which was the cutter used. This consisted of a row of vibrating knives acting over stationary blades, and was the first vibrating cutter. It was also the first to combine the reciprocating and advancing motion, and was the first hint at the third class of cutters, or those with a reciprocating knife. Numbers of new machines were brought out every year, but none were perfect enough to be of very great value to farmers. Up to 1831 there had been two French, one German, thirty-three English and twenty-two American inventions recorded.

America was the birthplace of the successful reaper. In no respect have American inventors exhibited their genius to a greater degree than in the development of farm machinery. They have emancipated the farm laborer from a galling task and made possible a wonderful progress in agriculture. The number of inventors is very great, but as to which should have more credit for furthering the development of machines, it is difficult to decide. Each profited by the new inventions of the other and as the result of their combined efforts in improvement we have the wonderfully complicated, but perfectly adjusted reaper and binder, cutting a five to eight foot swath in the heaviest grains, and leaving the bundles neatly tied and bunched conveniently for shocking. And in the immense wheat fields of the West we have the combined header and thresher which cuts the grain, threshes and sacks it ready to be hauled to the barn. These machine