

naturally better adapted to live stock production than grain growing. Also where live stock production is entirely practicable, but conditions favorable for grain growing. The fact should not be lost sight of that where profitable systems of live stock farming are practicable, they are preferable to systems of exclusive grain growing. It will be time enough to abandon live stock production on Illinois farms when conditions have so radically changed that grain farming is more profitable. The state has put inadequate but relatively large amounts of money into the study of soil fertility and as a result the agricultural experiment station has developed a system of grain farming which is certainly profitable and almost as certainly permanent. No one believes, however, that Illinois should rest her future, agriculturally speaking, on a single system of farming. There are several systems of live stock husbandry which are believed to be even more profitable than the system of grain farming referred to and which are equally permanent. These systems are yet to be worked out and exploited. *What the state has done for exploiting a system of grain farming should now be done in a larger way in establishing and exploiting systems of live stock husbandry.* While it is true that the fertility of a farm cannot be maintained simply by returning to the farm the manure made by live stock fed upon the crops grown on that farm it still remains true that most systems of live stock farming call for the purchase of less plant food than any system of grain farming."

These comments apply well to many localities of the Canadian West. Our prairie soil has not been long under cultivation, but already there are evidences that the storehouse of plant food is running low. Live stock raising with judicious handling of manure will help to maintain the supply and to continue a high average yield.

Wheat Color and Flour Yield

Considerable interest has been taken in the article, "Wheat Values in England," that appeared in our issue of April 13. Color and yield of flour and white wheats versus red wheats, are two questions on which it is difficult to reach a definite conclusion. On having his attention called to our article, Prof. Robt. Harcourt, of the Ontario Agricultural College, Guelph, writes:

I do not know that there is anything very radical in the statement of your English correspondent with reference to the emphasis which he puts upon color and yield of flour. Where flours are anywhere equal in color strength is the prominent factor, but no matter how strong the flour may be if it has not a desirable color it is not a saleable article. The consuming public place so much dependence upon appearance, or, in other words, the baker must do so much to please the eye of his customers that color is a very important factor. Yet, the miller can go too far in that direction, because unless there is a good quality of gluten to make the bread rise well, no matter how white the flour is it will not make a white bread. On the other hand many of the macaroni wheats make very strong flours, judging by gluten content, but when the flour is baked they produce a very undesirable, unsaleable loaf of bread. Here we have strength and absorption of water, but poor color. On the other hand, if some wheats we may have poor strength with a desired color. You cannot make any comparison of flour without taking into consideration far more than one or two, or even two or three factors. The Alberta Red Winter wheat has a gluten content greater than that of the Manitoba hard, but when baked it does not produce anything like so de-

sirable a loaf of bread. Yet, a year ago the English millers were paying a cent a bushel more for that wheat than they would for the Manitoba hard. This was because it was a strong wheat and brought up the strength of their weaker and whiter wheats.

I would not like to base my judgment of the strength of flour on the gluten content alone, nor on the power of the flour to absorb water. The more I study the matter the more I feel that you must have the flour baked and see the loaf of bread it will produce before you can form any clear judgment in the matter.

It is very exceptional in this country for white wheats to give a greater yield of flour than the red wheats. Many millers have made it a practice to pay more per bushel for red wheat than for white. I believe up until last year a milling company at Guelph, Ont., paid 2 cents per bushel more for red wheat than for white wheat. The red wheats as a rule produce stronger flour and more of it. However, it is quite possible that certain varieties of white wheats grown in certain districts might produce more flour and stronger flour than would be got from other red wheats. Indeed, it would be wonderful if there were not such exceptions. Wheat varies very widely in its composition and in the strength of flour that it will make, due to conditions under which it is grown, so that we might have a very strong white-wheat flour grown in one district and a very weak red-wheat flour produced from another district. The Manitoba grades of wheat grown in 1909 were very much superior to the wheat grown in 1908. There is over 3 per cent. more gluten in it, and it produces a bread which is very much superior to that of 1908. In this case, of course, gluten content and quality of flour have corresponded, but it is not always the case, and I am citing it more as an illustration of the variations there may be in wheat. Practically every year has its own characteristics, so far as strength is concerned.

Selection and Improvement

EDITOR FARMER'S ADVOCATE:

Selection, as a means of improvement in plants or animals, seldom receives the full credit due it. Of all forms of improvement it is perhaps the most important. All other forms must be supported by selection, either before or after their own application, or no progress can be made. Cross-breeding, the most familiar means of improvement, must be preceded by selection, in order to obtain individuals having the desired characters, in the greatest number, and most highly developed. It must be followed by selection, to eliminate those individuals that have not inherited the desired combination, or have not done so in proper proportion; also those having the desirable characters least highly developed, and those showing undesirable characters. In attempting to produce, say a new variety of wheat to meet certain climatic, or other conditions, it would be impossible to find two or more varieties having only the desired characters. It would be necessary, in order to obtain the best results, to select those varieties having the greatest number of good points in combination with the fewest undesirable ones, and from these varieties those individuals having the desired characters most highly developed, the undesirable points least highly developed and in the fewest numbers. After the crossing, or combination, had been effected it would be necessary to select those individuals in which the greatest number of desirable characters appeared in combination with the least number of undesirable points; also with the good points most highly developed in proportion to the bad ones.

The present high state of development in our domestic animals is generally stated to have been attained by breeding, but this term is not taken to include the necessary selection, without which no progress could have been made. Mere cross-breeding could have effected nothing. How, for instance, could the speed of the present day race-horse have been attained without the aid of selection? Is it not true that the greatest advancement in this line has been made long

since the crossing, which produced the combination or breed, had been effected? If their speed is to be still further increased, can it be effected by other means than the selection of the speediest individuals within the breed? Certainly no amount of crossing with other breeds would produce any increase. Just as certainly would the tendency be in the opposite direction.

This is true in all special lines of improvement, whether of animals or plants. The breed, or variety once formed, further progress must be obtained through selection. That strain to which selection is most carefully and rigidly applied, will prove to be the best.

The principle of selection is being applied every day in the improvement of all our breeds of domestic animals, but is often lost sight of, and all credit given to cross-fertilization. It is also beginning to take its proper place in the improvement of our cereals and other farm plants. Though the conditions here are different, and other methods of selection must be applied, yet there is no doubt that the room for improvement is as great as that which has taken place in the animal kingdom.

The advantage given in the improvement of animals, by cross-fertilization, is perhaps fully offset by the vastly greater numbers available for selection among plants. Some also, of the disadvantages of animal breeding are removed by the self-fertilization of our cereals and other plants.

Though there may be differences of opinion as to the proper or most efficient method of selection in the improvement of plants, all have already something to their credit, any difference in results being of degree only. If then systematic selection has been applied in the breeding of plants for as long a period as has been the case with animals, a vast improvement will have been made.

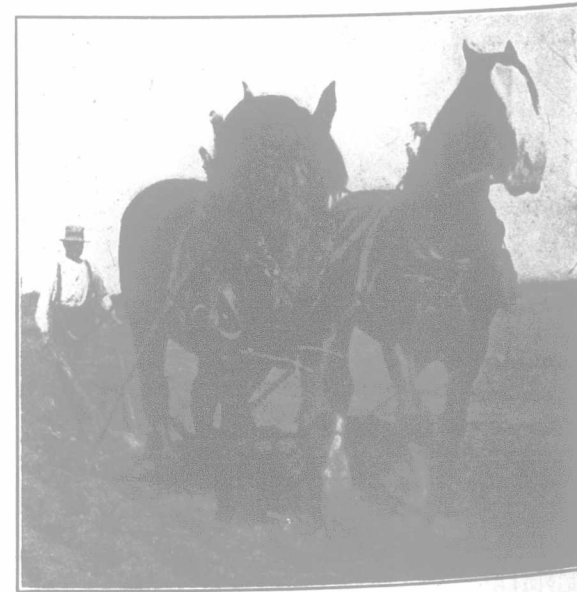
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HORSE

Observations on Horse Subjects

A lot of draft stallions are starting out at this season to do the first hard work they have done in a year, big, fat, flabby-muscled brutes, that have been kept without much exercise since last breeding season, now suddenly started on the road and expected to travel so many miles a day and foal nearly every mare they take a chance on, without losing seriously in weight or without an alarming number of the foals coming dead, too weak to stand, or puny and unlikely to develop into anything worth while. Having the stallions in this condition in the spring is not common, but each one of us can recall one or more such horses travelling in our districts last year, and every year in fact, big, soft, blubbery horses, some of them evidently "fattened up" for the breeding season and none of them likely to throw strong, virile stock.



WHERE STALLIONS ARE MADE USE OF TO ADVANTAGE ON THE FARM.