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An Idaho Wheat Problem.

(By Prof. J. Shirly Jones, Chemist of Idaho Experiment Station).

When Prof. Crosthwait asked me to speak before the members of the Idaho Agronomy Association, upon the topic before you, "An Idaho Wheat Problem," I hesitated somewhat before giving my consent to this arrangement. Not but what it is apparent that we are face to face with a problem relating to wheat culture and improvement in this part of the country, but because it seems to me that we have not much more than entered upon its solution and I at first thought it best not to bring the matter up for discussion at this meeting. However, upon further reflection, it seemed apparent that the more matters of this nature are discussed in gatherings of this kind, the broader will become our views and the more quickly can we look for results from what work is being done or is in contemplation. Indeed it is conceivable that the problem in its broadest possible form (i. e., from seed selection to marketing, in one form or another, of the finished crop) might very profitably be opened up here. However, I do not intend to deal with the question so comprehensively. My remarks have two objects in view, first to bring to your attention a certain phrase of the problem (that of improvement in quality) and to ask your co-operation in its solution, and second, to outline as briefly as possible certain lines of investigation which are to be taken up by the department of chemistry. Investigations which we hope will prove to be of value to wheat growers in general and of Northern Idaho in particular.

That part of the problem before us, briefly stated, is this, a substantial and permanent improvement in the quality of wheat raised for flour making purposes, while not allowing a decrease in the average yield or the loss of any of the desirable qualities our wheats already have. At present, the greatest part of the wheat growers here is intended for flour making purposes, but it should be borne in mind that while the yields are for the most part entirely satisfactory, the quality of the flour made from it is not quite what our millers desire nor what we believe it can be made by proper methods of seed selection and culture. The millers want a "stronger" wheat, simply because the trade demands a "stronger" flour. By "stronger" we mean a wheat that will not only yield a higher percentage of gluten in the flour made from it, but one whose gluten shall have the characteristics which enables the bakers to get, from a given weight of the flour, the highest possible number of good loaves of bread. It should be the pride of every wheat growing locality that its wheat yields a high grade of flour. But if your miller has to have wheat shipped in from other sections and uses it in preference to yours, something is wrong. You should try to ascertain what it is and seek for a remedy. By so doing you will undoubtedly be able to do something towards the solu-

tion of this problem. Not all of our flour is poor. But at present there is far too much of our wheat that is being ground into flour for exportation to the Orient, simply because it can't be profitably sold on the home market.

There are evidently a good many factors to be taken into consideration if we are to get the best possible results from our wheat crops. Climate, altitude, soil ingredients, all doubtless exert an influence upon the quality of wheat produced. So far as I am aware, however, no one has yet been able to say that this or that factor always predominates in the making of a good strong wheat. Just as some of the older wheat growing sections of the country had to experiment for a number of years before finding the varieties best suited to their conditions, so we will have to pass through similar stages of experimentation before finding the solution of the particular phase of the question which confronts us. The reason for this is found in the simple fact that wheat, not being a native of the United States, its introduction into this country has been attended by the usual difficulties waiting upon the introduction of new plants, that of acclimatization, etc. If, when the seed is transported to its new home, it finds soil, climate, etc., to its liking, i. e., similar to those it was accustomed to in its old home, no great difficulty is experienced in getting it started and it will soon do as well in its new as in its old home. When, if the selection has been a wise one, wheat growers may soon profit by whatever merits it possesses. But should the new condition be not similar to the old, there is almost sure to follow a retrogression in quality, yield, etc. The introduction of Turkey Red into Kansas and Southern Nebraska some eighteen or twenty years ago, was a most fortunate occurrence for those states and has resulted in making that region justly famous as the producer of most excellent brands of flour, for the wheat took very kindly to its new environments and was A1 from the start. On the other hand, other sections which are also producers of good milling wheat now, were not so fortunate, for after the introduction of certain varieties which were fairly good, these had to be improved upon by tireless selection and crossing. Blue Stem and Fifes of the Dakotas and Minnesota are examples in point. This is true of other sections, for the most part the best wheat that is grown in any locality is the one that has had the greatest care taken in seed selection, as the one that has been originated from stock, also carefully selected, which had certain good qualities, but was not quite all that was wanted in a milling wheat. My point is this: Every section that is adapted to wheat growing at all has of necessity to introduce seed to start with. Now should none of the varieties introduced prove to be all that is desired in the matter of quality, improvement based upon the most desirable of these has to be resorted to. This is done by seed selection from that

which is being grown, and breeding up new strains from them.

Now Idaho is facing just these conditions, having been settled by people from all parts of the country, we naturally find wheats being raised here now that were favorites in the older wheat growing sections of the East and South. Of the varieties now growing some need no improvement in regard to yield, hardness and similar characteristics. But in many cases the tendency is for the nitrogen content, the element that goes toward the making of a strong wheat, to decrease from year to year. Our problem, again stated, is to stop this retrogression and if possible to get the nitrogen content to increase.

There are apparently certain sections of this country which cannot grow a strong wheat without constantly bringing in new seed from more favored localities. This is said to be true of the southern states, and more or less so of California. So far as I am aware (if we leave out of consideration the macaroni wheat which is being extensively experimented with at present) neither has been able to introduce or originate a wheat that will, year after year come up to the exactions of the millers. It is possible that the reason may be found in the soil composition. We have good reason to be thankful that we are by no means the producers of the poorest grades of wheat.

In concluding this part of the discussion I would sum up by saying: We have some excellent wheats, Blue Stem and Red Turkey being perhaps the best. While Club, being a more prolific yielder, and really not so far behind the others in quality, is not to be omitted. Thus far we cannot tell exactly what causes the tendency to deteriorate in "strength" taking the same varieties some sections, viz: the Lewiston country, produces a stronger product than do others. It is possible that, like California people, less favored localities will have to turn to this one for their seed wheat. I believe, however, that eventually every locality will solve the question for itself by choosing a variety which will adapt itself to and lend itself to improvements in that locality. It has been my experience in wheat growing that on almost every farm, certain parts of the field will grow a better grade of wheat than others. The grain is heavier and darker in color. It is an easy matter for any grower to select his seed wheat from such areas. The chances are in favor of a better quality the succeeding season, other conditions being equal. It appears to me that the most feasible thing for the wheat grower to do now is to exercise care and attention in selecting his seed wheat. Either bring it from a more favored locality or do as suggested on your own farm. The department of agronomy has been experimenting with varieties and will probably make certain crosses in order to develop a new strain better suited to this section as a whole. The probabilities are that we already

have enough varieties. But no one should hesitate to experiment in a small way with anything new while he has the characteristics wanted here.

The second object in discussing this question is to bring to your attention and consideration certain lines of work which the department of chemistry is taking up. Most growers have a pretty good idea concerning the relative merits of whatever varieties they are growing. The millers can tell if the farmer is in doubt. But in order to get to the bottom of the whole matter, the chemistry department expects to keep this question uppermost for a time. We propose to analyze samples of wheat from as many parts of the state as show a radical difference in altitude, climate, methods of cultivation, or any other difference which might possibly cause a difference in chemical composition of the wheat grown there. The samples are to include as many different varieties as will fairly represent those being grown in this state. A record of such analysis for a term of years ought to, and probably will, shed some light upon the question of deterioration in quality.

This will undoubtedly open up a still broader field of work. The effect of soil ingredients upon the composition of the grain grown upon it. The influence of rotation of crops, for certainly we want to do away with so much summer fallow. Will the nitrogen added to the soil by the growth of clover or other leguminous crops be made use of by the grain following it and all of these points ought to be investigated. And finally the examination of the milling offer for its feeding value, will come up for consideration. And will undoubtedly be a valuable addition to our knowledge of the subject as a whole."

IDAHO'S WEALTH IN ORCHARDS. Lucid and Comprehensive Review of States Horticultural Interests.

Judge Fremont Wood, president of the Idaho Horticultural Association, delivered the following able address at the annual meeting at Payette:

"Ladies and Gentlemen and Members of the State Horticultural Association:—

"It is not necessary for any of us to state that we are more than favorably situated with reference to soil, climate and natural surroundings to make this one of the great fruit producing regions of the country. This fact has already been demonstrated, and all that is needed for the future is the ascertainment of the best methods, from the point of selecting the site for the fruit orchard until the product of our labors is placed upon the market in the most attractive form.

It is less than 90 years since the first work on Horticulture was published in this country. The work referred to was "A view of the Cultivation of Fruit Trees and the Management of Orchards and Cider." It was published by one William Coxe, esq., of Burlington, New Jersey, in 1817. In his introductory observa-