



Marquis wheat, second generation, grown under the rules of the Canadian Seed Growers' Association on the farm of the Agricultural Development Company Limited, Strathmore, Sask.

## When to Cut the Wheat Crop

### The Various Stages of Ripening---Conditions in Normal Years---Handling Rusted Wheat

By Seager Wheeler

As this article is intended as a guide to wheat growers, to point out to them the best stage at which to cut a field of wheat, so that it will yield grain of the highest quality, I am backing it up by many years' experience in grain fields at the different periods of the plant's growth. Owing to the losses of the wheat crops due to rust and frost of the season of 1916, it may be of some benefit and offset in some measure similar losses in the future. It is hardly possible to put in writing absolute information as to the exact stage at which crops ought to be cut, but the following directions may serve as a guide, especially to those who couple it with some close study of the berry or grain as it is nearing the ripening period.

The season of 1916 in the western provinces will be remembered as one of the most disappointing, with respect to yield and quality, as far as the wheat crop was concerned. Hail, rust and frost took heavy toll of a most promising crop—one that we had a right to harvest. The season opened up unusually favorably in the Spring and conditions were all that could be desired in respect to the moisture in the ground. Abundance of rain fell after the seed was sown. The germination was very uniform; the growing crops were in a healthy condition, and up until the end of July gave indication of a heavy, uniform yield. From that time on a change took place. Rust appeared. In general the fields that gave the greatest promise were the most disappointing at threshing time, while the fields that were given scant attention at seeding time in many cases gave better results from a point of yield and quality than the better prepared fields of summer fallow. Hail also exacted heavy toll, but as this is an agency over which we have no control, I shall only deal with the losses due to rust and frost. The greatest losses were due to rust.

#### Lessons From Our 1916 Experience

The reason for some of the poorer fields giving the best results may be traced to the fact that they were nearer maturity when the rust began to develop than the better fields. The heavier crops were retarded by their rank growth and consequently the rust affected these crops previous to the full development of the grain.

One lesson that we may take from the past season's experience is that the early varieties of wheat escaped the rust and frost, which caught the later varieties, and also that the early sown fields escaped with least injury because they were nearer maturity than the late sown crops. Red Fife has been largely replaced by Marquis and other earlier varieties and it is due to this fact that we had so much marketable grain this past season. Conditions might have been serious had Red Fife been as largely grown as it was some years ago. But even Marquis does not mature early enough to entirely escape damage by rust and frost. Rust played serious havoc in the wheat fields of Saskatchewan, Manitoba, and, to a lesser degree, in Alberta. A considerable acreage was left uncut as absolutely worthless, and it had to be fired this spring previous to seeding. Many thousands of acres were also harvested that yielded grain of a very low quality and but for the high prices would have been harvested only at a loss.

In many sections the grain is of such poor quality as to be unfit for seedling purposes. The estimated percentage of loss in the field for Canada is 43 per

cent. of the crop for 1916 and the loss in money is estimated as \$102,350,000. Personally, I would consider the loss even greater. In Minnesota and the Dakotas the loss in the field is estimated at 72 per cent. of the crops. All this loss was due to rust.

#### Late Maturing Crops Most Affected

Rust is present in every country where rains and dews descend. It is present in our western provinces every season, and may be found on the wild rose bushes and some of the grasses. There are some indications of it almost every season in the grain fields, although not generally serious enough to be noticed. Whenever conditions are favorable for it to develop, however, we can expect it more or less according to the season. Fortunately, under our conditions, it does not appear to any extent in the crops until the last few days of July or early in August, and it depends largely on the conditions of the crops at that time whether it will be serious or not. Varieties of wheat that are partly or wholly filled, though not fully matured, at that time may be expected to continue development and to be harvested without any serious injury.

The late sown crops and those growing on rich fallow, which were so badly affected by the rust and later by the frost, were retarded in the ripening process owing to the heavy precipitation and were affected by the rust at a stage when the berry was beginning to fill or was only slightly filled. Consequently the ripening process was checked by the rust to such an extent that many such fields are standing today uncut. In other fields the frost completed the damage started by the rust. There are some conflicting opinions as to whether it is advisable to leave the crop standing or to cut it down when rust is working. Whether it is advisable to cut or not depends largely on the weather conditions, the stage of the berry and on the time of the season. It can best be determined by the grower, and it will call for some judgment on his part. He should make a personal examination of the berry to see whether it is at or past a certain stage. This point I shall indicate. By it the grower may be able to determine whether it is best to cut the crops or not. I feel confident that if this point were more generally understood than appears to be the case, considerable of the loss that occurred last season might have been prevented. Another factor that must be considered is the probability of frost, as frost may come any time after the middle of August.

#### Cutting Sometimes Delayed Too Long

After a number of years' experience in the grain fields and smaller experimental plots conducting seed selection work and growing many different varieties and strains of wheat, work which calls for close inspection and investigation throughout the growing season, I am in a position to assert that a considerable acreage of the wheat crop of the past season should have been cut sooner than it was and that the grain was more fully matured than was generally known. Many fields that yielded a low grade wheat should have been harvested earlier. If they had they would have yielded at least two grades higher. This point will be confirmed by many of the readers of this article who, becoming

anxious about the crop, started cutting. After making some rounds they were not satisfied that the crops were ready to cut and pulled the blader off the field. The balance of the field was left standing until some days later, but when the two lots were threshed found that the first lot to be cut gave grain of a better quality than that which was cut last. In some instances this was due to the rust continuing to damage the crop and in other cases to frost that damaged the plants that were left standing. I am perfectly convinced that rust eats up the crop if it attacks it at a certain stage. This proceeds until, when the crop is cut and dried, it is found that there is no substance in the grain, only the shell or bran being left.

When the berry is only in the soft dough stage it may be found more advisable to cut it than to leave it standing and run chances of a frost or further dying by rust. A frosted or frozen crop may be disappointing, but it is of more value than a crop that is eaten up by rust, for the reason that the frost sometimes causes a loss only of grade and very little for the weight. Rusted grain loses both in weight and grade. Most serious of all is a rusted crop left standing until it is frozen. Frost and rust will injure it separately. Frozen wheat is of more value for seed purposes than badly shrunkened rusted seed. Therefore, if the grain is only in the soft dough stage it may be more advisable to cut it than to leave it standing. If cut at that stage there will be sufficient moisture or juice in the straw to continue the development of the berry while in the stock. This point was largely overlooked last season. Further on I hope to make this point clear.

#### Conditions During August, 1916

As I pointed out the crop up to the end of July was most promising. As we entered the first few days of August, there were whisperings in the air of rust appearing in the fields. At first this was not taken seriously, but as the season advanced and the crops were backward in changing color from a green to a ripe color, there was more anxiety about it. It was the general topic in every section of the country and there appeared an absence of safe opinion as to what to do about the crop. The one outstanding fact was that the straw did not ripen up and in the main remained green. It was a puzzling situation for many growers and there was some indecision as to the right course to adopt—whether to cut the crop or leave it standing in the hope that it would mature. This was a point that many were unable to decide, because they based their judgment as to when the crop was ready to cut on the color of the straw. As the straw did not color up naturally as is the usual case in a normal season, many fields were left standing too long and were caught by the frost. This whitened or dried (but did not injure) the straw. Then the crop was cut down as quickly as possible.

In a normal season one can determine fairly well when the crop is ready to cut by the color of the straw as it ripens in the normal way. Many have their judgment on the straw, cutting when it is ripe at the first joint, or when there is no moisture in the straw just above the first joint, but this is not always a safe rule to go by. Taking, for instance, the dry season of 1914. The straw ripened prematurely, owing to the hot dry weather and hot winds early in August, before the berry was fully

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