

Corn Instead of Wheat.

Shall we sow fall wheat this year? Shall we continue to grow fall wheat? Farmers are asking themselves and each other these questions, and it is well that the FARMER'S ADVOCATE is having them discussed in its columns.

To begin with, we all agree that fall wheat is not as profitable a crop as it used to be. Prices are low. When wheat sold for \$1.00 to \$1.25 per bushel, as was the case twenty to thirty years ago, to go no further back, no crop was more profitable. During that period I know of one (new land) field which was broken up after the stumps were burned off, summer-fallowed, and two crops of old Diehl wheat taken off in succession. The first yielded 40 bushels per acre and the second 34. The first crop was sold at \$1.25, the second at \$1.12½ per bushel. Figure that up. It amounts to \$88 per acre in two years. Those times are gone. Will they ever return? We don't know. The average price for the past five years, including this year, has been 69 cents per bushel. Have we any reason to expect that prices in the near future will on the average be higher? We can't tell, but think not.

Another factor in the question, the one which this year has made the question a live one, is the Hessian fly. As this insect has been in the country for many years, and only once in a while has caused great loss, as is the case this year, it is not likely that in years to come losses from this pest will be continuous, but only occasional.

Another element in the case which has changed somewhat is climatic conditions. The fact that last spring scarcely any wheat was winter-killed should not make us forget that two years ago the loss from that cause was very great. During the intense frost of February what little snow had fallen was blown off, except where sheltered by forests, now so much scarcer than formerly. Some fields that year, which were not plowed up because there was on them a good stand of clover and timothy, were not threshed, but cut for hay. Three years ago, on the other hand, wheat came through the winter well; the straw was immense, but the yield of grain light. The quality was fair, but the heads were only about half filled. One man said his, which yielded 18 bushels per acre, had straw enough for 40.

On the whole, during the past ten years, oats have been a more profitable crop than wheat—not that they have been so with many farmers, but some have found them more profitable, and so would nearly all if the land to be sown with oats had been as carefully prepared and as well manured as the wheat land.

In spite of all the drawbacks, however, wheat is a favorite crop, and not without reason. Work is better distributed throughout the year. While a great deal more work is given to preparing the land for wheat than for spring grain, it comes in a less busy time. The harvesting also comes in nicely between haying and oat harvest. No other crop gives such an abundance of good straw for bedding, which is an important matter in these days of increased stock-raising. Also, though the price of wheat may be low, it is fairly steady, and if one is short of cash at any time, he can always get a supply by taking in a load of wheat. Lastly, and most important of all, a good catch of grass can be got more surely with fall wheat than with any other crop.

We thus see that good reasons can be urged on both sides of the question. Considering everything, however, we believe that it would be wise for Ontario farmers to largely discontinue the growing of fall wheat. Not that it is wise to jump hastily out of one thing into another. When that is done the jump is generally made at the wrong time. Wheat is poor this year. Next year, reasoning from past experience, it will probably be good. But, having thought the whole matter over, and decided what to grow instead, farmers generally in our Province would profit by letting other countries supply the world with wheat. We say, generally, because some have land more suitable than others or it suits their rotation better, or to get grass seed to grow with a crop they must have wheat. But, generally, we say, wheat-growing in Ontario should be abandoned, except where conditions are specially favorable.

But what shall we grow instead? Some will say, sugar beets. Possibly, but here again the advice quoted above would be appropriate: "Don't jump too quick." In chatting with a farmer lately, on a train, about the way wheat was yielding, he said he had none. "Plowed it all up and planted corn." He was sensible. Corn is the most profitable farm crop at the present time. Let us, instead of depending on wheat, plant more corn and keep more stock.

Middlesex Co., Ont.

A Lasting Lime Wash.

We are frequently asked for receipts for the preparation of lasting lime washes for outdoor work. One, of which a writer in a contemporary speaks very highly, runs as follows: Slake half a bushel of unslaked lime with boiling water, keeping it covered during the process. Strain it, and add a peck of salt, dissolved in warm water; three pounds ground rice put in boiling water, and boiled to a thin paste; one-half pound powdered Spanish whiting and a pound of clear glue, dissolved in warm water; mix these well together, and let the mixture stand for several days. The wash thus prepared should be put on as hot as possible, with a painter's or whitewash brush.

The Grain Rusts.

BY PROF. WM. LOCHHEAD, O. A. C., GUELPH.

The damage done by rusts every year to the grain crops of Canada may be safely estimated by hundreds of thousands of dollars. The amount of damage varies with the individual years, according to variations in atmospheric and soil conditions. During damp, warm seasons, the damage is usually so severe that in some localities but a fraction of the possible yield of grain is obtained, which scarcely pays for the trouble of harvesting and threshing.

THE LIFE-HISTORY OF WHEAT RUST.

Two stages of wheat and oat rust are probably well known. One, the Red Rust, develops in early summer; and the other, the Black Rust, in the late summer and autumn. The characteristic colors of the two stages are given by masses of spores growing in layers upon the plant body of the rust. This plant-body consists of a network of threads living in the tissues of the wheat stem and feeding on the living liquid material. The spores project from the inside of the wheat stem by the rupture of the skin or bark, and are separated from their stalk by the wind, which may continue to carry them all summer to other wheat and oat fields. Thus the infection spreads by means of the red-rust spores throughout the summer. From the same plant body which produces the red spores, appear the black spores later in the season in equally large numbers. These, however, must remain dormant all through the winter on the stubble of the field before they will germinate, so that the black spores are not instrumental in the infection of new fields the season they are produced. The red spores are minute, oval, spiny, one-celled bodies, but the black spores have thicker walls, and are two-celled.

In the spring the black-rust spore develops a tiny thread and produces new spores called Sporidia, which does not affect the wheat plant, but readily affects the leaves of the barberry. Two sorts of spores are formed on the barberry leaf by this infection. One kind is readily seen on the upper side, and the other on the lower surface, in yellow, minute cups called cluster-cups. It is known that the orange-colored spores when set free from the cluster-cups and blown away to a wheat field will infect the wheat and give rise to a parasitic fungus plant-body within the wheat stem or leaf, from which red spores are produced.

HOW THE RUST SPREADS.

In districts where barberry is common, the fungus, to all appearances, uses that shrub as a second host, and the full life-cycle is then completed, as already described. The cluster-cup spores infect some of the wheat plants close by, and give rise to plant-body within, from which red-rust spores are liberated during the early summer, and the black rust later in the season. In the vicinity of Barrie, the fields of wheat are very badly rusted this year; moreover, this destruction of wheat by rust is an annual occurrence there. The infestation is manifestly the result of the spread of the cluster-cup spores from barberry hedges, of which there are three miles in the town of Barrie. In all cases the wheat close to the hedges is shockingly bad, and the further removed the field is from the hedge, the rusting is less marked. The infested wheat has grains so shrunken that they would scarcely weigh 20 pounds to the bushel. Two or three interesting cases were noted in the same township on the influence of barberry hedges on wheat fields. A few years ago, one or two farmers planted some hedges of this shrub, but to their dismay their wheat fields became badly infested, although prior to planting no rust had been observed. After the removal of the offending hedges, rust did not again make its appearance. Mr. C. A. Zavitz, Experimentalist at the Ontario Agricultural College, has a like story to tell. So long as a fine barberry hedge flourished along one side of a certain field on the College farm, the crops were badly rusted, but so soon as the hedge was removed, the rust failed to appear. Lately, however, the College fields are badly rusted. It would certainly appear from these and many other cases which might be given, that if the barberry is not absolutely necessary for the continuous propagation of wheat rust, it is at least a very important factor. The conditions favorable to the spread of rust are moisture and heat. A rainy season, when the intervals are characterized by intense heat, is an ideal one for the spread of rust. Thus, seasons when thunderstorms are frequent, and the accompanying winds are strong, will have more than the usual amount of rusted grain.

The red-rust spores are distributed by the winds, and the rapidity of spread is marvellous. Those whose training has not been scientific look upon the rust as though it were like the hot blast of a fire scorching the leaves from a distance. As a matter of fact, when the red-rust spores are wafted by the wind to unaffected leaves, a period of incubation occurs, from seven to ten days or more, before the rust spots appear on the leaves and stems. It may be stated here that atmospheric conditions, such as abundant moisture, either as rain or dew, and hot spells, are not the cause of rust, but simply conditions under which rusts will propagate themselves most rapidly. It is not likely that the smoke of locomotives has any influence whatever in the spread of rust, as some farmers claim it has. It is also very essential that plants suitable to the fungus be present if the disease is to spread rapidly, for every fungus has its own peculiar plant upon which it feeds.

PREVENTION AND REMEDIES.

At present no satisfactory method is known for the prevention of the loss by rust. Spraying the crop, although theoretically good, is practically impossible, while pickling the seed grain is useless. No practicable method of "polishing the atmosphere" and preventing rust spores from finding their way to the young wheat has been devised. Australia is working along the line of development of rust-resistant varieties, and has secured results of great practical value. "That country now has wheat varieties that are vigorous, true to name, and of exceptional quality for the particular region in which they are grown." While some attention has been given to this important question in America, little has been done in Canada. It is believed, however, that varieties of wheat with narrow, erect leaves and a stiff skin upon which there is a marked waxy "bloom" are as a rule less easily infected with rust than those with broad, soft, green leaves. In England, Nursery, Trump and Squarehead are highly resistant. In New York and in Canada the bearded varieties appear to suffer least. Turkey Red makes a good showing, while the Glydon of Dakota showed practically no traces of rust. There appears to be no appreciable difference in resistance of the following varieties sown in Ontario—Manchester, Early Red Clawson, Genesee Giant, Dawson's Golden Chaff, and Democrat—as all were equally infected. It is apparent, from the study of plants, that if rust-resistant varieties are to be produced in a province like Ontario, where marked variations in soil and surface conditions exist, the varieties will have to be developed locally. Along the line of prevention of rust, it has been urged that an excessive use of nitrogenous manures, such as dung or nitrate of soda, should be avoided, as it tends to a growth of strong, soft stems to which rust spores can easily effect an entrance. Again, good drainage is decidedly beneficial, for the dampness of the soil and thereby excessive moisture of the air will be removed, and the conditions made less favorable for the development of the fungus, as has been described.

Preparation for Fall Wheat.

LIVE STOCK AND DAIRYING INSTEAD OF WHEAT.

To the Editor FARMER'S ADVOCATE:

I agree in every particular with your excellent article on "Shall We Sow Fall Wheat?" in last issue of FARMER'S ADVOCATE. We all know how hard it is to get out of an old rut. Apart from the Hessian-fly troubles, I have for some time been of the opinion that the time had come when we must largely reduce, if not altogether quit growing, fall wheat in parts of Ontario for the present, and likely for some years to come. Our only hope is in live stock and dairy products. Especially is this the case in the neighborhood of our large cities, and the sooner we admit this the better.

I would not sow fall wheat before the 10th or later than the 20th September, and prefer from 5th to the 15th.

Fall wheat does best following peas, corn or clover sod plowed as soon as possible after clover is cut. In each case, thorough surface cultivation as soon as crop is cut and a top-dressing of well-rotted manure. The best crop I ever had was on a good fallow plowed four times—not very deep; but I think the cultivator would take the place of two plowings now. We have had to quit sowing peas in our locality on account of the pea bug; this we find a great inconvenience.

I know of no variety proof against the Hessian fly. Dawson's Golden Chaff has given the best returns for a number of years; this year the sample and yield is very poor of all varieties in our locality. Peel Co., Ont. J. PICKERING.

SOW LESS WHEAT AND DO IT WELL.

To the Editor FARMER'S ADVOCATE:

This district, the southern part of Perth Co., has escaped the ravages of the Hessian fly to a great degree this season, as compared with other near-by localities. There has been a few fields affected, but on the whole the wheat has suffered very little from this cause, whatever may be in store for the coming year. Notwithstanding the promising condition of the plant in the early part of summer, there is general disappointment as to yield and quality, the heads were small and the kernel shrunken, the latter being caused, no doubt, by the hot winds which ripened the grain from a week to ten days too soon.

It is not customary to sow wheat here in August; in fact, the bulk is sown from about the 5th Sept. to the 15th. This may be one reason for the non-appearance of the fly in many fields. It is my opinion that only land that is in first-class condition, being naturally rich or having recently received a liberal supply of manure, should be sown to wheat, because at current prices only a full crop will pay for the use of land and labor expended. A smaller acreage than that now sown, under better treatment would give better results. My observation and experience have taught that the best results are obtained from land which has been summer-fallowed and manured (although the summer-fallow is not general here). Pasture or hay land plowed in July or early August, and then worked well till time of seeding or after; peas which have been sown on sod, either fall or spring plowing, and manure in any of these is effective every time. In the preparation it is essential that the land be plowed some time before sowing, so that it may become firm, and the surface well