

times that of a steam engine, and the first cost is but a trifle more; and when one stops to consider that no attendant is required after the engine is started, it will be realized at once that the cost of power is very much less than for steam power, even though wood could be obtained and used for fuel at no expense, as it would require a man to fire it at least, and a man's time would be worth more than the cost of fuel to run a 10 h.-p. engine all day under full load.

With a gasoline engine there is not a possible chance for fire—nothing to blow sparks into a nearby stack, and thereby burn down an expensive barn or house. The farmers are appreciating this more and more each day. Where there were formerly only a few portable engines used for threshing in the field, there are to-day, perhaps, more gasoline engines used than steam, on account of their safety. We frequently hear of a steam plant blowing up, and the engineer and a number of innocent bystanders being blown to pieces—with a gasoline engine an explosion is absolutely impossible.

On a smaller plant, where they are not used continuously, they have the great advantage over steam or any other power, of being able to be started immediately, and give out full power, and when they are ready to be shut down all expense ceases immediately as soon as the valve is closed. There is no water or coal to be cared for, and a five-gallon can of gasoline will run a moderate size engine for a period of from 10 to 20 hours. Therefore, the item of fuel for gasoline engine is so small, and can be transported so easily by hand or by buggy, that it is not worth mentioning; while, on the other hand, for a steam engine it would require a team, wagon and man to haul fuel and water, and all of this would be charged up to the item of expense.—[J. A. Charter, in Jersey Bulletin.]

Encourage the Increase of Bumblebees.

Editor "The Farmer's Advocate":

An important reason why our red clover is often disappointing in the yield of seed is the lack of fertilization of the flowers. Entomologists tell us that the bumblebee is the only insect that fertilizes the red clover, and without fertilization there can be no seed. Lack of bumblebees appears to me to be the greatest cause of failure of any that we have in the production of red clover seed. And why is it so? Notwithstanding their weapon of defence (and who has not felt the sharpness of it?) their enemies have prevailed against them. There is not now one bumble for twenty there were thirty years ago—mice or boys have played havoc with them. Who is there who cannot remember how, when a boy, he used to go hunting bees' nests; how he used to kick old logs and stumps, and listen to hear the buzz of bees—if any were there—and how, if the sound were heard, the log was torn to pieces and the battle raged? Straw hats were dilapidated, and sometimes boys' faces too bore marks of the conflict. It was fun for the boys, but death to the bees. It is not indulged in to the same extent to-day; one reason being that there are no old stumps in which the bees can nest. The wire fences afford poor shelter for the bees, so they are fast becoming extinct, and we suffer the penalty of poor crops of clover seed.

New Zealand had to import bumblebees before they could get clover seed at all. Mr. C. W. Nash, of Toronto, tells us he had an order this year from New Zealand for Canadian bumblebees, as they think they are more active than those they have from Europe. Now, Mr. Editor, are we to make no effort to restore former conditions? We cannot replace old stumps, logs, etc., but we may provide other shelters for these invaluable helpers of ours. We notice their fondness for nesting in wool. Everyone knows that if a bundle of wool is left any time in any of our outbuildings, it is soon inhabited by bumblebees. An old buffalo robe, laid away for a time, is often found to contain a nest of bees, and if we were to put boxes in out-of-the-way places—about our buildings or about our fields—in which were put a few ounces of wool, and so fixed that they were protected from wet and field mice, we would be doing something towards increasing the number of bumblebees. Many keep the honeybee at considerable cost, and with profit, too; yet a good colony of bumblebees on a farm on which red clover seed is grown may be ten times more profitable than a colony of honeybees, and the cost of affording them a home a mere trifle.

Your valuable paper may do great work in teaching the people the necessity and value of putting forth some effort to afford them the protection necessary. School teachers should be informed of their great value, that they might instruct the school children; and if each and all do something to help protect in place of destroy bumblebees, it will add largely to the country's wealth. W. S. FRASER.

North York, Ont.

What Variety of Wheat to Sow.

A subject that will never be exhausted is varieties of farm crops. At this season, when a considerable acreage is about to be put under the drill for fall wheat seeding, we probably cannot do better than give the results of the variety tests at the Experimental Department of the Ontario Agricultural College, Guelph. We quote as follows from Prof. Zavitz's 1905 annual report:

According to most authorities, there are in all seven types of wheat, and to one or the other of these types, or species, all varieties belong. The seven types of wheat are as follows:

- (1) Common, fine, or soft wheat (*Triticum vulgare*).
- (2) Turgid, or toulard wheat (*T. turgidum*).
- (3) Hard, or flinty wheat (*T. durum*).
- (4) Polish wheat (*T. polonicum*).
- (5) Spelt (*T. spelta*).
- (6) Emmer, or starch wheat (*T. dicoccum*).
- (7) One-grained wheat (*T. monococcum*).

Nearly all of the varieties of spring and winter wheat which are grown in Ontario belong to the common wheat (*Triticum vulgare*). Some of the best-known representatives of other types are as follows: Wild goose spring wheat, Medeah spring wheat, Algiers spring wheat, Polish spring wheat, Miracle winter wheat, etc. Practically nothing is known throughout the Province regarding either the turgid or the one-grained wheats, as they have never been under general cultivation.

WINTER WHEAT FOR FLOUR PRODUCTION.—Two hundred and forty-five varieties of winter wheat have been grown at the Agricultural College within the past sixteen years. Of this number, about two hundred have been tested in each of five seasons, and fifteen in each of ten seasons. All varieties of winter wheat are tested for a period of five years, after which the inferior kinds are dropped and the most promising sorts are continued in future tests. The following table gives the average of ten years' results of each of fifteen varieties regarding the color and the weight per measured bushel of the wheat, and the yield per acre of both the straw and the grain:

VARIETIES.	Color of grain.	Lbs. per bushel (9 years).	Tons of straw (10 years).	Bush. per acre (10 years).
Dawson's Golden Chaff.....	White	59.7	3.6	57.3
Imperial Amber	Red	60.2	4.0	54.3
Early Genesee Giant.....	White	59.5	3.7	52.8
Russian Amber.....	Red	60.6	3.8	51.8
Early Red Clawson.....	Red	58.7	3.5	51.6
Egyptian Amber.....	Red	61.1	3.9	50.9
Rudy	Red	60.6	3.2	48.8
Tasmania Red.....	Red	61.5	3.5	48.4
Tuscan Island.....	Red	60.9	3.5	48.2
Bulgarian	White	60.3	3.3	47.3
Geneva	Red	62.1	3.5	47.1
McPherson	Red	61.8	3.2	46.7
Turkey Red.....	Red	61.1	3.2	46.1
Kentucky Giant.....	Red	60.5	3.3	46.0
Treadwell	White	60.2	3.3	45.9

Sixty-one varieties of winter wheat were grown in the Experimental Department during the past year. The five highest yielding kinds were of the Dawson's Golden Chaff class, having beardless heads, red chaff, and white grain. The yields in bushels of grain per acre of these varieties were as follows: Abundance, 62.7; No. 6 White, 61.0; Superlative, 60.1; Dawson's Golden Chaff, 59.5; and American Wonder, 58.7. In weight of grain per measured bushel, all the five varieties went over the standard of 60 pounds, the Dawson's Golden Chaff and the Abundance reaching 61½ pounds. These varieties are all softer in the grain, but yield more bushels per acre than such sorts as Tasmania Red, No. 5 Red, Turkey Red, Crimean Red, and Buda Pesth. Those varieties of red wheat which gave the highest yields of grain in the past year were as follows: Imperial Amber, 58.2 bushels; Auburn, 57.7 bushels; Genesee Reliable, 57.1 bushels; Early Ontario, 56.8 bushels; and Prosperity, 55.9 bushels per acre. The average yield of grain per acre in 1905 was 56.7 bushels for the eighteen varieties of white wheat, and 51.7 bushels for the forty-three varieties of red wheat. Generally speaking, the white wheats yield more grain per acre, possess stronger straw, weigh a little less per measured bushel, and are slightly softer in the grain than the red varieties.

Weeds.

Wordsworth says:

"To me the meanest flower that grows can give Thoughts that do often lie too deep for tears."

How expressive of the feelings of the average farmer, as he yearly does battle with the plague of weeds! The old saying is that "Nature abhors a vacuum." It seems to be true, for no void and desert place is seen which does not harbor a weed of some sort. The lawn is covered with dandelions, the garden is full of pigweed, and over the fields the yellow heads of mustard snell trouble without end. Should not our teachers in

the public schools teach something of the common weeds of farm and field? Not long ago, a farmer was found cultivating ball-mustard, and preserving it in his garden patch, because he thought it a valuable food for cattle. It is actual knowledge that is needed. Every man, woman or child living in a country district should know the common weeds, and until they do we shall continue to be cursed by the plague of weeds.

The Hessian Fly.

During the summer complaints have reached us from several sections of damage to fall wheat by that old enemy, the Hessian fly, and it will be well for farmers in infested districts to take reasonable precautions that the crop now about to be sown may be not unnecessarily ravaged. The Hessian fly, as most of us are aware, hatches two distinct broods in the fall-wheat area of Canada. In the Northwest there is usually only one. In Ontario the mature flies develop and become active in August and September, and lay their eggs on the young blades of new-sown fall wheat. From these eggs minute grubs hatch and make their way down the stem to the base, where they embed themselves and feed upon the sap of the plant. By winter they have entered the pupa stage, becoming what are popularly known as "flaxseeds." In May and June flies will emerge from the "flaxseeds" and lay eggs on the wheat blades for another brood. Again grubs hatch from the eggs and make their way down the stalks, this time embedding themselves at one of the lower joints of the stem. It is these maggots which do the harm noticeable at the time of ripening. They pass the summer as "flaxseeds," in the stubble as a rule, and the flies appear in August and September, as above stated. The immediate effect of the larvæ or grubs in the young wheat is to either kill the plants outright or to so weaken them that they make a poor growth, and in all probability succumb to winter-killing. Then again in the following spring the flies from the hibernating flaxseeds lay their eggs, from which hatch the spring brood, which causes the crinkling of the grain and prevents the kernels from filling. The fly is thus a double scourge. In Manitoba, where the spring brood is the only one, the flies are carried over winter in the pupa stage of the early-spring brood.

With us, the appearance of the fall brood of adults is believed to vary somewhat, according to weather conditions. Cool, damp weather during the breeding season is believed to be favorable to the development of these insects. If during the last week of August the weather were cool and moist, the flies would come on rapidly, and be at work depositing their eggs during the first week of September, whereas, if the weather continued hot and dry till well into September, the appearance of the laying flies would be deferred somewhat, and wheat sown much before September 20th would be in danger of being affected. The opinion of investigators is that wheat may be sown, with comparative safety in any locality a week or ten days after the fall brood have emerged and commenced laying their eggs. To attempt to formulate a rule prescribing a date at which it is safe to sow fall wheat in all seasons is unsatisfactory, although the consensus of opinion is that wheat sown after September 20th is pretty sure in the ordinary season to miss the attentions of the egg-layers, and in some years it is comparatively safe to sow almost any time after September 10th. There is this in favor of deferring seeding till, say, the middle of September; by cultivating the ground frequently until that date more weed seeds are germinated and destroyed, while the tillage puts the ground in the best possible condition to insure prompt germination and thrifty growth of the wheat, thus enabling it often to get as good a top as it would do sown earlier in a less perfectly prepared seed-bed. The brood comes on a little earlier in northern than in southern latitudes, a fact which is fortunate for farmers in districts where wheat must be sown in the fore part of September in order to secure enough top to stand the winter.

There are sometimes apparent anomalies in connection with attacks of Hessian fly, which, to the uninformed, tend to discredit the recommendations of investigators. In some cases wheat sown very early has been known to come on ahead of the fly, and when the latter appeared it seemed to prefer the more tender blades of the later-sown crop. This, however, should be regarded as an exceptional circumstance, and one hardly to be depended on. Some varieties of wheat are more resistant than others. Varieties with large, coarse, strong straw are less liable to injury than weak-strawed, slow-growing varieties. Wheat sown on a stubble field where the fly had been bad on the previous crop would run a much graver chance of injury than that sown on ground where wheat had not been grown for a year or so. Wheat on dryish, poor land is much more susceptible to injury than that on rich, moist but well-drained soil. Thick seeding and vigorous growth tend to ward