

FARM.

Improvements in Farm Machinery.

Reference is frequently made to the vast improvements that have been effected in agricultural implements and farm appliances during recent years. In this connection we recently requested manufacturers to name what in their judgment constituted the one most important feature or device from the point of serviceability to the farmer which they had incorporated in any farm machine which they were turning out. Among the replies received up to the time of going to press are the following:

STEEL FOR WOOD.

THE FROST & WOOD CO. (per H. Horseman, Manager Toronto Branch):—"In our opinion, among the many changes and improvements made in farming machines during the past few years, the almost complete substitution of steel for wood is the most practical benefit to the purchaser, as machines can be made not only less cumbersome, but lighter and stonger, and will last much longer."

THE WIND STACKER.

JOHN ABELL ENGINE AND MACHINE WORKS, Toronto:—"The Wind Stacker is probably the most important new feature in connection with threshing machines. The Band-cutter and Self-feeder which we are supplying is also very serviceable."

ROLLER AND BALL BEARINGS AND THE OPEN-END BINDER.

MASSEY-HARRIS CO., Toronto:—"While it is quite true that vast strides have been made in the way of improvement and development of agricultural implements of all kinds during the past year or two, it may be said that these improvements are largely in the way of perfecting principles already pretty well understood, rather than bringing out of startling and radical changes. In our own line large sums of money have been spent and a large number of patents taken out on various features of our machines and implements to make them more perfect. Perhaps the most marked advance has been the application of what is known as the Massey-Harris Perfected Roller and Ball Bearings to our various machines. These were not put in until they were thoroughly tested and proven practical and efficient in every sense of the word, and have met with appreciation and admiration at home and abroad. In this age of keen competition, with a business extending the world over, our abilities are taxed to their utmost to watch every detail in the construction of our machines and to keep them to the front in the various lines in which we do business. Probably the average individual has but little conception of the time and money that we spend in thinking out and developing even the most minor detail of every implement and machine we manufacture. It is the careful attention to the 'little things' which in these days makes for success, rather than radical changes in the mechanical principles of the machine. The mechanical principles of the machines we manufacture, and which we control and have protected by patents, are for the most part the principles we have advocated for some years and proven to be the best in every sense. The perfection of the Open-End Binder was accomplished by ourselves in the face of much opposition."

DEERING BALL AND ROLLER BEARINGS.

DEERING HARVESTER CO. (per H. H. Hannon, Gen. Agent, London, Ont.):—"We have made so many improvements in the past few years that it would take up considerable space to enumerate them, but the one leading feature which has revolutionized farm machinery has been the application of Deering Ball and Roller Bearings to binders and mowers."

ROLLER AND BALL BEARINGS ON WINDMILLS AND GRAIN GRINDERS—NEW GOVERNING POWER AND PUMPING MILLS—ANGLE STEEL FRAMES.

GOOLD, SHAPLEY & MUIR CO., Limited, Brantford, Ont.:—"We select three of the greatest improvements:—"First—Roller and ball bearings on windmills and grain grinders. We were the first in Canada and elsewhere to use them, and hold a Canadian patent on them. The first design was not fully satisfactory, but the improved roller bearings now in use for three years are an absolute success and are used on 95% of our output. One strong point of our roller bearing patent is the use of a steel outer case in which the rollers run. Windmills fitted with proper roller bearings give greater power and are more durable."

"Second—The new principle of governing both power and pumping windmills by which they are held into the wind by a governing device which allows relief to the wheel when struck by a heavy blast of wind, gives more equable speed, and also relieves the user from all anxiety about the safety of the mill. If the wire or other attachments break, the large spring on the mill pulls it out of the wind and applies a powerful brake, and stops it very quickly. All other windmills work on the opposite principle of letting the wheel loose into the wind and pulling it out to stop it. If the attachments give way the wheel will run wild until the wind slackens sufficiently to allow of its being stopped and the break repaired."

"Third—The use of an angle steel frame for our 'Steel King' pump, making it lighter and much stronger; also, the use of a malleable sprocket drive chain instead of cast iron gears. The mill runs twenty per cent. lighter and as noiseless as a bicycle, and is very durable."

THE NEW PATENT PEA BUNCHER.

TOLTON BROS., Guelph, Ont.:—"We think possibly the pea buncher is about the most important feature we have added of late. This device can be readily attached to any kind of harvester now in use and marks a revolution in the history of pea harvesting. It combines simplicity, lightness, durability, cheapness, strength, economy, and efficiency."

STEEL HEADS ON GANG PLOWS AND IN LAND ROLLERS—PNEUMATIC ENSILAGE CUTTERS.

THE WILKINSON PLOW CO. (Limited), Toronto:—"We have made three important improvements in farm implements in the past two years. Steel Heads on Gang Plows instead of cast ones—this obviates any fear of breakage—the most annoying thing that can happen to a farmer. Steel Heads in Land Rollers—these obviate the bolts and nuts of the spokes continually working loose, stones getting inside of roller, rattling and frightening horses, and the wet getting in and spoiling the steel. Our Pneumatic Ensilage Cutters are, of course, the greatest advance of all, and in this we are far ahead of our American cousins, as also in the Steel Head Roller."

"We do not think any other firm in Canada can show three such radical changes and improvements in so short a time. It might be well to add, that even with all these improvements, we have reduced the price to farmers instead of charging extra for the increased advantages, although they were of course a source of great expense to ourselves."

GAS AND GASOLINE ENGINES.

THE GOLDIE & McCulloch Co. (Limited), Galt, Ont.:—"Heretofore we have done nothing with farm machinery, but recently we have been manufacturing the 'Model' Gas and Gasoline Engine, which seems to be particularly adapted for farm use. We also make the 'Tiger' Grain Chopper, and enclose you circular of both of these machines herewith."

NEW MODEL SEED DRILL, ETC.

JOHN S. PEARCE & CO., London, Ont.:—"Among the many useful implements invented and placed on the market for the use of farmers, market gardeners, and others, we think there is none that has proved more generally useful than the 'New Model' seed drill which we have been manufacturing here in this city for some years. This has given every satisfaction.

We have sent them all over the Dominion, and have yet to hear of a single customer who is not more than well pleased with these."

"Other articles of very great use and service to farmers and market gardeners is the 'New Universal' double-wheel hoe, plow, drill, etc. These combined are the most unique and complete tool we have ever seen. We have been handling these for two years, and the company now contemplate manufacturing these here in this country for the Canadian trade."

FLEXIBLE AXLE SUPPORT.

THE MILNER-WALKER WAGON WORKS CO., Walkerville, Ont.:—"The greatest improvement we know of in the construction of farm or team wagons is the flexible axle support, which, like all others of the most important vehicles, trucks, lorries, railroad cars, etc., are supplied with a cushion bumper in such a manner that the suddenness of the blow is entirely relieved, enabling us to give a guarantee against breaking during the full life of the wagon. This is our Mr. Milner's invention and patent, and is used only upon our 'The Milner Wagon' as manufactured by us."

Growing Peas.

BY T. G. RAYNOR.

The prevalence of the pea weevil in many of the pea-growing districts of Ontario has caused many farmers to practically give up pea-growing. This is unfortunate, as everyone realizes the value of a good pea crop. Not only does the grain make very strong feed, but the straw, if cut early enough and handled properly, is splendid fodder. Living as I do in a pea-growing district, where thousands of bushels are grown for the export seed trade yearly, and where many are grown for local wants, we would feel very keenly indeed the lack of this crop. Where fall wheat is grown largely, clean pea ground in many respects takes the place of a bare fallow as a seed-bed for wheat by merely working the surface soil well with disk harrow and cultivator after the crop is removed. The principal reasons for this are that peas are nitrogen-gatherers, and thus leave a rich seed-bed, as well as a good firm under-bottom for wheat-growing.

To insure a paying crop of peas, good seed is indispensable. The question at once arises, how am I to get good seed where the pea weevil puts in his nefarious work. Reference to Mr. C. A. Zavitz's valuable article on "Seed Selection" in the last Farmer's Institute report clearly shows the difference between good and poor seed, both by ocular demonstration and word description. The results of several experiments were given. I saw some of those experiments in question, and there was a marked difference in weevily seed as compared with sound seed, of small seed compared with plump seed, and of split seed compared with whole seed, every time in favor of the good, plump, sound seed. Mr. Zavitz says that in four carefully-conducted tests with weevily peas that only 59% of weevily Marrowfats grew, while only 87% of the Golden Vine germinated. The Kansas Experimental Station reports similar results—that out of 500 weevily peas, representing ten varieties, only 25% grew, when 95% of the sound seed germinated. In the case of split peas as compared with sound peas, Mr. Zavitz reports that the yield per acre was 29.3 bushels for sound, while only 9.8 bushels per acre was obtained from split pea seed.

Treatment of the Seed.—These experiments are pretty conclusive evidence on this point, but cannot this trouble be remedied, and if so, in what way? I may say that the carbon bisulphide plan is the one adopted by the large seed firms represented in Prince Edward County. As a result of this treatment, while our farmers were growing almost wholly the company peas, the pea weevils were becoming practically exterminated. Owing to tariff changes in the U. S., the price of peas was reduced 40%, and resulted in the sowing of less company peas by the farmers. They commenced to sow their own untreated seed, and as a consequence I am sorry to say that the pea weevil is becoming as prevalent as ever, excepting perhaps along the lake shore, where they never are so bad as a few miles back from the lake. This leads me to the conclusion that, as pea-growers, all peas should be treated to kill the bugs as soon after harvest as possible. It is of little use where a few in a neighborhood would treat their peas and the rest neglect it. We must co-operate in this matter if we are to hold this branch of grain-growing and make it profitable. Every farmer, at little expense, could provide himself with an air-tight box to treat a few bushels of peas in at a time. It is estimated that one ounce of the carbon bisulphide will treat 100 pounds of grain, or 1½ pounds of the liquid is sufficient to treat one ton of the peas in 48 hours, in which it is required to kill the bug. To my mind, a more feasible plan would be for a number of farmers to co-operate and put up a "bug house" at some central point (say an elevator or gristing mill) having a 500- or 1,000-bushel capacity. The peas could then be stored in bags in this house and treated on a large scale. A bug house with a 1,000-bushel capacity would cost about \$100, and a half gallon of the carbon bisulphide, poured in a shallow pan, placed on top of the pile of bags inside, and allowed to evaporate, will kill all the bugs in the 1,000 bushels of peas in 48 hours if the building is properly constructed. It will be properly constructed if it be practically air-tight. Great care must be taken that no fire of any kind shall come in contact with the fluid or vapor, as it is very inflammable. It is a heavy, suffocating gas which seems in its downward movement to penetrate the skin of the pea, and kills the bug in any stage of its development. Many of the light, inferior, bug-eaten peas may be separated from sound peas by pouring the peas in a solution of brine, when the sound peas will sink and the unsound ones will

float, and may be skimmed off. In treating with the carbon bisulphide, the bad odor in coming from the bug house will disappear in a short time on exposure to the air, and will be harmless when fed to stock.

Kind of Soil.—The kind of soil best adapted for pea-growing we find is gravelly clay, where the gravel is limestone. However, peas do well on most soils if properly drained, but good drainage is essential to a paying crop of peas. The heavy and humus soils tend to produce too much straw, at the expense of the pea. This, to some extent, may be overcome by sowing the shorter-growing varieties on the stronger classes of soils.

Condition of the Soil.—I like the soil in a nice friable condition to get a suitable seed-bed. If the land be well worked, it need not be especially rich in nitrogen, but more or less humus in the soil is necessary to provide against lack of moisture by holding not only the water which comes from the clouds, but the soil water which too often escapes into the air by soil evaporation rather than plant evaporation. This soil condition is more required in pea-growing than in some of the other grain crops. At the blossoming time peas require plenty of moisture. The blossoms soon dry up if it should prove dry at that time. Again, they need moisture at the filling time, hence the necessity of such soil conditions as will prevent hard baking of the soil and will admit of a fine tilth on the surface, to act as a mulch.

Preparation of the Soil.—As a rule, I like fall-plowed land for a pea crop. If well ridged, Nature's pulverizer, frost, will put it in good form for a fairly deep seed-bed. Peas require to be sown more deeply than other grain. The seed-bed should be about four inches in depth to admit of sowing them from two and a half to four inches deep in the soil. Peas have been known to germinate a foot deep, even to the amount of 50 per cent. Four inches deep gave the best result in a test made at the Michigan Experimental Station.

A timothy sod plowed in the fall and well worked up in the spring makes a good preparation. Sometimes clover may kill in the spring of the year to such an extent that it is deemed advisable to plow it up. We often find late peas do exceptionally well on such a chance when sown broadcast and plowed under four or five inches with a gang or single plow. The land should be dry enough not to bake, and then pulverize with the harrow very fine, when the whole should be immediately rolled. On an over-dry, lumpy surface in the spring, a good heavy roller previous to seeding will do much to prepare the soil well for peas. The furrows should be plowed quite full in order to get a level surface over which to run the pea harvester.

Time to Sow.—The time to sow peas depends upon the variety a good deal. As soon as germination starts is none too early, in a warm soil, to seed with the early varieties, while often Golden Vines are sown quite late (June 1st) with splendid results. In our experience, taking one year with another, the last of April seeding gives the best results. I noticed in the report of the Experimentalist at the College that their experience is similar—seeding about the 22nd of April gave the best results. One of the great dangers in too late seeding is that just about the blooming time, or a little later, when the peas commence to fill, we often get rain and a damp, foggy time, lasting off and on for four or five days, which almost invariably means mildewed peas and only half a crop.

Method of Sowing.—In our experience, we get the best results by waiting until the ground is in a suitable condition to drill the peas in. They are better covered and germinate more uniformly. When we can, we sow north and south, to give the sun a better chance at them when starting to grow. We also find it a good practice, especially if the land becomes hard about the time the peas are pricking through, to go over the crop with a light, sharp iron harrow, or, better, a weeder, which breaks the crust, lets the peas through, and greatly stimulates their early growth. We like to roll our pea ground directly after seeding it.

Quantity of Seed per Acre.—The quantity of seed we use per acre of course depends upon the size of the pea. The larger the pea the more seed used, and vice versa. We sow as low as 1½ bushels of Golden Vines or small peas up to 3 bushels per acre of the larger varieties. Of course, if the seed be poor or the land not quite so good as we should desire, we sow enough more to make up for these drawbacks.

Varieties.—With regard to the varieties, I may say that there are very many used in the seed trade. For the general pea-grower there are a few varieties which will meet all his requirements. For years the Golden Vine, the Prussian Blue and the Runner pea have given our farmers great satisfaction. The Runner pea, a medium-sized sort, has been less affected by the pea bug than have other varieties, but it is not free from its ravages. There are other varieties which have been tested at the Guelph Experimental Station and which have been selected by Mr. Zavitz for co-operative experiments in the Province by the Experimental Union. These are the Early Britain, White Wonder, Mummy, and Chancellor. A reference to Mr. Zavitz's report in the College Report this year will show what he says about the 52 varieties he has had under experiment, some of them for quite a number of years. In that report he mentions the Oddfellow and Mummy as being comparatively free from the attacks of the pea weevil.