Millet.

Although millet has been grown for feed as long as I can remember (and I'm no spring chicken), yet it has never become a staple crop, or grown in any appreciable quantity, seldom more than five acres on any farm. Although a safe and comparatively easy crop to grow, it has always been regarded as a sort of catch crop, of value only when the meadows fail; yet chemical analysis shows it to be superior to timothy in everything but fat, in which it lacks only four-tenths of one per cent. (practically nothing), and in crude fibre one and three-tenths per cent., which is advantageous, as crude fibre is the must indigestible portion of the plant, and considered to be practically worthless. It also contains five and one-half per cent. less water (cured under the same conditions), which is another advantage, especially if one is buying by the ton. In protein (the most valuable constituent), it is over one and one-half per cent. richer than timothy, as follows :

Timothy Hay—Water, 13.2 ; ash, 4.4 ; protein, 5.9 ; fibre, 29 ; carbohydrates, 45 ; fat, 2.5.

Hungarian Millet—Water, 7.7; ash, 6.0; protein, 7.5; fibre, 27.7; carbohydrates, 49; fat, 2.1.

This, of course, refers to millet cured for hay. I could not find any standard analysis for millet straw, but, having threshed some Siberian millet, I had a sample of the straw analyzed at the O. A. C., resulting as follows :

Water, 5.24 per cent.; ash, 6.27; protein, 6.05; fibre, 32.26 ; carbohydrates, 47.68; fat, 2.50.

As we should expect, the greatest difference is in the amount of fibre, due to the greater ripeness of the stem, but otherwise there is not as much difference as one might expect. In fact, it is better than oat straw, which runs as follows : Water, 9.2, ash, 5.1; protein, 4.0; fibre, 37.0 ; carbohydrates, 42.4 ; fat, 2.3. And much better than either wheat, rye or buckwheat, and probably also barley straw, though I have not the data; but it is risky feeding, because of the awns. When we come to consider its digestibility, as before, there is no data for the straw, but we find that the Hungarian millet hay again excels the timothy hay, as follows :

Timothy Hay—Organic matter, 57.9 ; protein, 46.9 ; fibre, 52.5 ; carbohydrates, 62.3 ; fat, 52.2.

Hungarian Hay—Organic matter, 66.3 ; protein, 60.0 ; fibre, 67.6 ; carbohydrates, 67.1; fat, 63.9.

This means that there is a higher percentage of the constituents of millet hay made use of by the animal than of timothy. Even the fibre is easier digested, besides having less of it than the timothy. These results were obtained from numerous experiments with living animals, and may be relied on as being correct for practical use.

From this, may we not infer that millet straw is at least the equal of oat straw in digestibility, and, being richer in valuable food constituents, and lower in percentage of water, is it not worth more per ton for feeding ? In fact, millet straw is superior in food constituents to timothy hay, though containing more fibre (3 per cent.), and as oat straw and timothy hay are about equal in digestibility, it would seem that millet straw, cured without rain, as mine was, might be very nearly equal to timothy hay for feeding. It may even, for practical purposes, come little short of millet hay, for, as commonly cured, it is fairly matured, containing much seed which, we think, makes it unsafe for feeding in large quantities ; but, being allowed to ripen, and cut on the green side, so the seed will not shell too much, the straw, when threshed, is fresh and green, and some think it quite equal to ordinary timothy hay, though, as usual, there is difference of opinion.

Millet is a good crop for wet land, as it can be sown any time in June or July (June 15th is about the best time), after the water-table has lowered in the soil, which allows time for plowing sod, on which it does well. The preparation of the seed-bed should be thorough. It can hardly be too fine ; roll and disk and drag, alternately. Firm it well, and sow with grass seeder on harrowed surface (two or three pecks). If soil is moist, rolling in will do, but if very dry, harrow and roll; and if soil be heavy, omit rolling, as heavy rain afterwards may pack the soil and prevent the young shoots getting through. It is a slow crop to start, especially if weather is cool, but, after starting, will grow rapidly, and mature in about sixty days. It is a hot-weather plant, and will not start well before middle of June usually. If intended for hay, it should be cut while in bloom, and is not usually a difficult crop to cure, as weather is usually dry at that time. Cut and ted, and, when fairly dry, coil up in hot part of the day, and then it will turn any rain, but it is better housed immediately after sweating.

If intended for seed, do not leave to get very ripe. It's better to sacrifice the small heads than lose the big seed of the big heads by shelling. Opinion is divided as to whether it is better to handle it loose or tie it. Circumstances must decide. If weather seems favorable, and the crop is long and heavy, I think I would tie, but we should remember that, whether using a self-feeder or not, the bands must be cut to make it feed evenly. If stems are short, it is difficult to cut with binder ; probably a buncher on mower, or a self-rake reaper would be better.

Foxtail is the principal adulterant, and it is wise to make sure the seed is free from it, if intended for seed. If for hay, it matters less. Siberian is the best seed-yielder, and at Guelph has produced over 50 bushels to the acre, but the soil must be rich, and the cultivation nearly perfect to get such a yield. Cured as hay, some varieties made four tons. In this locality, it is quite common to have two tons on manured land. Clean seed sells these years at about $2 per hundred, and retails at about $1.50 per bushel weighing from 48 to 54 lbs. The seed is used for birds, chickens, chop, and in Siberia, India, Japan and China extensively for human food. Screenings sold this year for half price. It is a good crop to precede wheat or rye, but, being a surface-feeder and quick grower, the soil must be rich near the surface to produce a good crop. I have no seed for sale. J. H. BURNS.

Perth Co., Ont.

Hydraulic Ram.

Editor "The Farmer's Advocate" :

I saw in your issue of March 25th an article in regard to a hydraulic ram. I have had one in for about ten years, and it is working fine yet. I see that the one answering the article gives an estimate of 100 feet of drive pipe, ¾-in., and a discharge pipe of ¾-in., and only 100 feet of discharge pipe, when it is 150 feet to the barn. I think the feed pipe and discharge pipe are too near the same size. Before I put in my ram, I looked up an authority on rams, and he said the most satisfactory way was to have 9 feet of feed pipe for every foot fall, and it only needs 1-foot fall to raise water 10 feet. S. W. H. only wants to raise it 8 or 9 feet, so that would only need 9 feet of feed pipe. Allow 1½-foot fall, it would only take 14 feet of feed pipe. The ram I have has 1½-inch feed pipe, and ¾-inch discharge pipe. I raise the water about 55 feet high, and only have 75 feet of feed pipe, and about 450 feet of discharge pipe. I do not think that 2 gallons per minute will go through a ¾-inch drive pipe while ram is working. This authority also says that 13-14 of the water goes through the plunger. That would only give a little over 1 pint per minute to go to the barn. If the inquirer has a stream large enough to fill a ¾-inch pipe, running free, I think he will have enough to run a ram with a 1¼-inch feed pipe and ¾-inch discharge pipe, which would give him far more water, and, I think, prove more satisfactory. At the rate that mine cost, it would cost about as follows : Ram, $14 ; 15 feet of 1½-inch galvanized feed pipe, $2.25 ; 150 feet of ¾-inch galvanized discharge pipe, $9.00 ; total, $25.25.

Be sure and dig your ditch deep enough so that if the ram stops, it will not freeze.

Brant Co., Ont. G. B. P.

COMMENT BY PROF. W. H. DAY.

I wish to thank you for forwarding me G. B. P.'s letter, for comment to appear concurrent with it. I do not know who is his authority on hydraulic rams, but if he will consult "Treatise on Hydraulics," by Merriman, than whom there is no better authority in America, he will find on page 520, second paragraph, the following words : "The least possible fall in the drive pipe of the hydraulic ram is about 1½ feet, and the least length of drive pipe about 15 feet." Also, the R. McDougall Co., who have been manufacturing and installing hydraulic rams for many years, write me as follows : "We think we are safe in saying that one foot would not be sufficient fall to operate any machine. It is possible, though, to operate a ram under a fall of 18 inches, but it would be considerably better if about twice this could be secured." Thus do scientists and practical men agree. G. B. P.'s rule of 1-foot fall to raise water 10 feet is not correctly stated ; it is only half of a general rule, which runs as follows : "With a fall one-tenth the height to the barn, the hydraulic ram will lift to the barn about one-fourteenth of the water flowing through the feed pipe." However, by adjusting the size of feed and drive pipes properly, the ram can be made to lift water 15 or 20 or more times as high as the fall in the feed pipe, but under these circumstances it will not lift as great a proportion of the water, flowing to it. When lifting water 20 times the head, it will deliver only about half as much as in lifting at 10 times the head, or one twenty-eighth, instead of one-fourteenth, using the same rule. On the same basis, if the height to the barn were five times the fall in the feed pipe, the ram would deliver one-seventh of the water at the barn. Thus we see that 1 to 10 is no rule at all, unless coupled with the fraction of one-fourteenth. And, by the way, while one-fourteenth is used by some as the amount delivered at the barn on a fall of 1 foot to 10 in height, the water has to be raised, yet many companies use double this amount, or one-seventh, in estimating the water delivered under these circumstances. But even if 1 to 10 were a fixed rule in itself, there is another point G. B. P. has overlooked, namely, that somewhere there comes a limit, a fall so small that the water flowing through the pipe will not get up sufficient velocity pressure to raise the heavy brass valve—i. e., the lowest head on which the ram will work is determined by the weight of the valve—and the limit comes at about 18 inches, according to all the real authorities I can find on the subject. So I think we may safely conclude that there must be at least 18 inches of fall, and that more is better.

Your correspondent seems worried about the oversight in the length of the discharge pipe. I trust it did not prove so troublesome to the majority of your readers.

As to the length of the feed pipe, I think we may discard G. B. P.'s 14 feet on the same basis as we discard his 1 foot of fall, viz., that it is below the limit. The McDougall Co. say that the feed pipe should be 25 or 30 feet, though it may be twice that length. The ram should work on about 15 feet, according to Merriman, but no machine gives its best results, highest efficiency, when working just on the limit, and so the feed pipe should be longer. I think 100 feet is really longer than needed, but the chief point of S. W. H.'s inquiry was the matter of cost, not the details of installation, and so plenty of leeway was given to make the cost high enough. The same applies to the size of ram and the amount of water. There are rams on the market to-day advertised to work on two gallons of water per minute, with the sizes of pipe referred to in my answer to S. W. H. Whether that size of ram will give enough water for S. W. H.'s purpose, I am not able to say, as he gave no idea of the amount of stock to be watered. The ram No. 2 would probably deliver about three barrels a day, under conditions mentioned by S. W. H. If this isn't enough, a larger ram would be better, provided there is enough water to run it.

In conclusion, I may say that, when answering S. W. H. through the columns of "The Farmer's Advocate," I also wrote him direct, referring him to some reliable firms, and advising him to send full information—amount of water available, water needed, etc.—to them, and let them advise, for, after all, while we may discuss principles, limiting conditions, and so on, the manufacturer's guarantee is, in the end, the determining factor in deciding what to install, and the sooner the purchaser gets in communication with him, the better.

Seed Above the Average.

The Seed Branch report in Census and Statistics Monthly says that the results of seed inspection indicate that, on the whole, the quality of the seed offered for sale this spring is well above the average. Dealers, both wholesale and retail, with some few exceptions, appear to be doing their best to comply with the regulations of the Seed Control Act. The greatest trouble is found where the retail dealers, who have no cleaning appliances, are handling farmers' stock. Owing to the difficulty of securing clean seed from farmers, most of the local dealers are now relying almost entirely upon the wholesalers for their stocks. During March, 37 official samples of seeds were taken by the seed inspectors which were suspected of being sold in violation of the Seed Control Act. Of these, 24 were red clover, 8 alsike, 1 timothy, 3 alfalfa, and 1 barley. Twelve were alleged violations of section 6, four of section 7, and twenty-one of section 8. With three exceptions, these suspected cases proved to be violations of the Act.

During the month, 672 samples were received at the seed laboratory for germination and purity test. Of these, 221 were red clover, 146 coming from seed merchants, and 75 from farmers. Of those analyzed for purity, 95 graded No. 1; 102 were salable, but not No. 1, and 18 were prohibited. Of the 152 samples of timothy, 113 came from seed merchants, and 39 from farmers. Of those analyzed for purity, 126 graded No. 1, 20 were salable, and none prohibited. One hundred and ten samples of alsike were received, 85 from seed merchants, and 25 from farmers. Of those analyzed for purity, 23 graded No. 1, 50 were salable, and 31 prohibited.

The first prosecution for violation of the Seed Control Act this season was conducted against a dealer, of Shelburne, Ont. The defendant had offered for sale a bag of alsike seed which the official analysis showed to contain catchfly and false flax at the rate of approximately nine per thousand of good seed. The prosecution was entered by the inspector who took the sample, and the defendant pleaded guilty, but escaped the payment of fine by disclosing the name of the firm from whom he got the seed.