a countersink ; screwdrivers ; chisels ; drawing knives ; files ; a try, bevel and framing square ; gimlets, and the several smaller planes. This should also be the place to put all logging chains, shovels, picks, axes, etc. If such a place were provided on every farm there would be less loss of the farmer's valuable time, often when it is most needed. J. H. STARK.

Peterboro Co., Ont.

Artificial Manures and Their Effects on Root Crops.

To the Editor "Farmer's Advocate":

Sir,—Now that in some districts at least of the old-settled parts of Ontario, farmers are beginning to consider seriously the question of artificial manures, and the growth of so many towns is creating a demand for straw, this would seem to be an opportune moment to enter into a discussion of the value of artificial manures and their effect on various crops. In England, Germany and France, where a great deal of straw and hay is sold off the land, farmers find it necessary to supply something in their place to prevent the rapid deterioration of their land. It is almost impossible in considering this question of manures, under such conditions as prevail on our large English farms, to correctly sum up even approximately the exact loss or gain on a year's farming transactions, no one year stands altogether by itself, hence the practice, when one tenant leaves a farm to be taken over by another farmer, by which the incoming tenant pays an "ingoing" fee, determined largely by the residual manurial value of all straw, etc., left by the leaving tenant. Where so much of our land is all down to grass the farmer, whether he be a dairyman, or is stock feeding for the markets, must depend not on the grain produce of his own farm to feed his stock, but on the Liverpool grain markets, whence come vast supplies of Canadian and American grain, with cottonseed and linseed in various forms, whilst he sells most of his own grain at a higher price than he can buy at, retaining only a part of his straw. This is where the artificial manure comes in. He sells his wheat straw at a price per ton to some factory in the town, and buys some artificial manure to the same weight, but at two or three shillings a ton less, whilst its effectual manurial value is possibly from twenty to even as much as forty times that of the straw. A very careful study of the action of these artificial manures is necessary, as, in some cases, a combination of two manures shows a most disappointing result, in that one may neutralize the other. This sometimes happens when nitrate of soda and basic slag are used on grass land. For some years experiments have been carried on in the counties of Stafford and Shropshire, under the auspices of a joint committee of their respective county councils, and directed by the experts of the Harper-Adams Agricultural College, at Newport, not only on the farm connected with the college, but also on farms in different districts of the two counties. The results have been carefully tabulated for several years, along with the cost of the manures ; and from these it is possible to calculate the cost of the increased yield, compared with the next plot of unmanured land in the same field. Let me give some of the results, with the cost, farmyard manure being valued at $1.25 per ton. I give the approximate figures in the Canadian coinage. It must be also remembered the whole cost of dressing with farmyard manure is charged to the one crop, whilst its value is certainly felt more by succeeding crops than is the case with some of the artificial manures.

In an experiment with swedes, at Blurton, the unmanured plot produced 10 tons 15 cwt. per acre, whilst an adjoining plot dressed with five hundredweight of superphosphates and ½ of a hundredweight of sulphate of potash gave a yield of over 14 tons 12 cwt., or an increase of 3 tons 17 cwts. per acre, the total cost being $5.45, or $1.40 per ton of increase. A plot dressed with farmyard manure, twenty tons to the acre, produced the far heavier yield of 25 tons 2 cwt., but manure being considered worth $1.25 per ton, the increase in yield cost $1.51, and the difference in the amount of labor in spreading twenty tons of farmyard manure and broadcasting not quite six cwt. of artificial manure is a consideration. Another experiment with swedes, carried out at Peatswood, was on the economy of using home mixed manures as against purchased compound manures. The cost per acre for the compound manure was about $11.50, and the yield in this case was 20 tons 11 cwt. The home mixed manure consisted of and was sown at the rate of, superphosphates, 3½ cwts.; sulphate of ammonia, ¾ cwt.; and nitrate of soda, 1 cwt., per acre, and the yield was 20 tons 16 cwt., or an increase over the other plot of 560 lbs. (5 cwt.), and the cost of the manure was about seven dollars. In the case of an experiment at Blurton, on exactly the same lines where the compound manure was used the crop per acre was slightly heavier than where the home-mixed preparation was used, but even then the latter was the more profitable.

A set of experiments, which should be of interest to sugar-beet growers, is one which has been conducted at the Harper-Adams Agricultural College, and which deals not only with the tonnage produced, but also with the composition of the roots produced. The crop is, of course, swedes, but the amount of sugar in the juice is given, and that is, after all, the main point. All the manures increased the crop, and the heaviest crop per acre was taken off the plot dressed with dung, at the rate of 15 tons per acre, with dissolved bones, 3 1-3 cwt.; sulphate of ammonia, nitrate of soda, and sulphate of potash, each about 1 cwt., and kainit, 4 cwt., the artificial costing $12.75 (nearly). The crop was over 24 tons per acre, rather more than double the crop from the unmanured plot, but the quality was very different. The roots from the unmanured plot contained 14.92 per cent. of dry matter, and their juice contained 12.65 per cent. of sugar, whilst those from the best manured and heaviest yielding plot showed 11.85 per cent. dry matter, and the percentage of sugar in their juice was 9.59. Then another plot, manured with dung and dissolved bones, at the rate of twenty tons per acre, and 3 1-3 cwt. per acre, respectively, produced just under twenty tons of roots, the cost of the artificial manure being $4.50 per acre; the percentage of dry matter was 11.96, and of sugar in the juice, 8.80. Again, after comparing the results of a series of experiments on this particular farm (where the plow land is of a medium loam on a clay subsoil, resting on the new red sandstone formation), shows that the use of potash with other manures has little or no result on the crop, whilst the addition of kainit, instead of either salt alone or of salt and potash together, has given the best results over a period of some years. Observations were also made at the same time as to the cause of mangels "bolting" to seed in the first season of their growth. It had been suggested that this bolting was caused by some injury to the plants in an early stage of growth, and to test this point the hand singling of several small plots was carried on close to plots of the same variety on which the hoe had been used, but at the end of the season it was found that the number of bolted plants was about equal in both cases. It had also been suggested that the age of the seed affected the plants bolting, but on making a trial of seeds from seven different years' crops, it was found that each plot had bolted equally, but different varieties differed considerably in the number of plants that bolted, and it has thus come to be considered that the different methods of producing seed is in part responsible for the bolting, whilst the season is also responsible for it to some extent, as in 1903 some varieties showed no tendency to bolt, and in the next season, which was much drier, the same varieties bolted rather badly. The bolting greatly affects the feeding value of the plants, as, taking the case of one variety alone, the sound roots produced 8.70 per cent. of sugar on analysis, and bolted roots of the same variety produced 5.64 per cent. sugar.

England. ERNEST S. SANDERS.

Millets and Their Uses.

The German millet (Setaria Italica Germanica) differs from the common millet, in being larger and coarser. German millet is a plant 3½ to 5 feet high. It produces an immense amount of forage, but does not mature so early, neither is it as good a drouth-resister as the common or Hungarian millets. The place of millets on the farm is that of supplementary crops, to be sown for fodder when the season is late. They are useful in short rotations—useful to aid in getting rid of weeds, and as a supplement to other forage plants, and to be used in place of a bare fallow. The millets in common use are the foxtail millets (Setaria or Chœtochloa Italica, var Germanica). These plants thrive well in rich, warm, loamy soils, but not on thin, poor land. It has been stated that a crop of millet on new breaking helps in preparing it for a subsequent crop. German millet is supposed to have been brought from British India, as it was formerly known as Bengal grass. Hungarian millet was for a time very popular, but it has a tendency to volunteer, which is a quality not favored by farmers. Millets are generally sown in the latter part of May or in June, on spring plowing, and if sown on breaking is sown after the breaking has been disk harrowed. The millets can be sown in the seeder or by hand—the former way preferably. The quantity of seed used per acre is from one-half to three-quarters of a bushel. Thin seeding frequently results in coarse stalks—not a desirable quality for hay. This class of fodders should be cut before the seed has begun to ripen, especially for horses. If cut too early the hay has too laxative an effect. The best time to cut is from complete "heading out" until late bloom ; or, as one authority puts it, "the best time to cut for hay is when the majority of heads have distinctly appeared." From experiments made in North Dakota, millet hay, in which the seeds had been allowed to ripen, had been found distinctly injurious to horses. Immature or overripe millet is said to produce abortion in mares and cows, although data of an experimental nature of this statement are not available. The millets are slightly laxative in effects on the bowels, and stimulate the kidneys to work ; immature millet is laxative, overripe diuretic (acting on the kidneys). Once a day is sufficiently often to use well-grown, properly-cured millet hay for horses, and it should not be fed oftener than twice a day for other stock ; preferably not at all to in-foal mares or cows advanced in calf.

Good Common Sense.

We are much pleased with your paper. It contains so much real good common sense, not only for the head of the house, but for the whole family.

Bruce Co., Ont. R. H. REID.

DAIRY.

Supplementary Summer Feeds.

"Beginner" writes, asking our readers to advise him through the "Farmer's Advocate," what variety of corn, or what single grain or grass, or mixture, they find best suited for supplementary summer feeding of dairy cows. The enquiry is timely, and the replies should be prompt as well as concise.

Alfalfa as a Substitute for Bran and Cotton-seed Meal.

An important point in feeding economy is to find something that can be raised on the farm to take the place of the expensive protein feeds, such as bran, oil cake and cotton-seed meal, which it is usually necessary to purchase in greater or less quantity and feed with the home-grown fodders to make a good milk ration. The value of alfalfa for this purpose is being recognized by practical dairymen, to whom the following results of an experiment by A. M. Soule and S. E. Barnes, of the Tennessee Station, will be quite credible :

Twelve cows were divided into three groups, one of which was fed corn silage, wheat bran, cotton-seed meal ; one, corn silage, alfalfa hay and cotton-seed meal ; and one, corn silage, alfalfa hay and wheat bran. The feeding period was four months.

Lot 1 consumed 21,376 pounds of silage, 3,624 pounds of wheat bran, and 1,207 pounds of cotton-seed meal, and produced 7,521 pounds of milk and 439.05 pounds of butter-fat. Lot 2 consumed 20,558 pounds of silage, 3,638 pounds of alfalfa hay, and 1,871 pounds of cotton-seed meal, and produced 7,689 pounds of milk and 424.89 pounds of butter-fat. Lot 3 consumed 16,139 pounds of silage, 3,350 pounds of alfalfa hay, and 3,725 pounds of wheat bran, and produced 6,414 pounds of milk and 347.99 pounds of butter-fat. The digestible matter consumed by the three lots for the production of a gallon of milk was, respectively, 6.5, 6.6 and 7.9 pounds, and for the production of a pound of butter, 11.3, 12.1 and 14.7 pounds.

From these results it is concluded that one pound of cotton-seed meal could be replaced by about three pounds of alfalfa hay, and one pound of wheat bran by about 1.5 pounds of alfalfa hay. The limit of this substitution will depend upon the individual capacity of the animals to consume the hay. It is stated that ordinarily not more than ten to twelve pounds of hay will be consumed when fed with silage, but that this amount may be increased to fifteen or twenty pounds when fed without silage. In this experiment the favorable results following the substitution of alfalfa for a part of the concentrates were attributed in a large measure to the feeding of these materials with a fine quality of silage.

The net cost of producing a gallon of milk allowance being made for the cost of food and attendance, and also for the value of the manure, was 7.1c. for lot 1, 5.7c. for lot 2, and 8.2c. for lot 3. The net cost for a pound of butter was, respectively, 12.3, 10.4, and 15.3c. From the standpoint of economic production, the best results were, therefore, obtained with lot 2. With alfalfa hay at $10 per ton, and wheat bran at $20, the saving effected by substituting alfalfa for wheat bran is estimated at 19.8c. per hundred pounds of milk, and $2.80 per hundred pounds of butter.

Experience with Milk Fever.

To the Editor "Farmer's Advocate":

In the "Farmer's Advocate" of March 2nd, I noticed a statement about milk fever with which my experience does not agree. One cow of mine last summer had the fever before being milked at all, as she went down before the calf had time to take any milk. Not being milked may have been in her favor, as she made a quick recovery. I had another case in hot weather in August. The cow was milked out clean after the birth of the calf, which was allowed to remain with her, and in seven hours she had the fever, and in eleven hours she went down to rise no more, as she died two days later. Another cow, I might mention, a short distance from the farm, went down with the fever before the birth of the calf even. I have no doubt this case was rare, as she was unreasonably overfed. I need hardly add that it was fatal.

Redeau Stock Farm. ALBERT E. WELLER.

[Note.—We have heard of cases such as these before, but believe they are very rare. In nearly every such instance the cow had been milked out before calving, as some people have done, with a view to preventing milk fever, which is a great mistake. It is very seldom that a cow whose udder is much swollen before calving contracts milk fever, if she has not been milked out clean in the first three days after calving. On the other hand, in most of the cases we have known the udder was quite free from swelling, and in some cases quite soft and flabby. We have not a doubt but the cows mentioned by our correspondent might have been saved by inflating the udders with air.—Ed.]