#### FARMER'S ADVOCATE THE

to 5 pounds, sow May 1st to 10th. Turnips may also be sown at this date up to June 15th, at the also be sown at this date up to June 15th, at the rate of 2 to 3 pounds per acre; sow on drills two feet apart. Thin carrots to 4 to 6 in.; mangels, 8 to 12 in.; turnips, 8 to 12 in. apart in the drills. To test seed, take a small box filled with earth, select 100 seeds, plant them in straight rows so that they may be easily counted. Keep the box in a warm place in the house, or a better plan is to send a small sample of each to the Central Experimental Farm, Ottawa, where they will be carefully tested and reported to the sender free of charge. I con-sider the following varieties best, carrots: Im-proved Short White, Mammoth White Intermed., Iverson's Champion Giant White Vosges; but there are several other short white varieties equally as good. For red carrots: Early Gem, Guerande or as good. For red carrots : Early Gem, Guerande or as good. For red carrots: Early Gem, Guerande or Oxheart. Mangels: Mammoth Long Red, Giant Yellow Intermediate, Champion Yellow Globe. Turnips: Purple-top Swede, Skirving's Champion, Jumbo or Monarch. As to keeping quality all of the varieties which I have mentioned are good keepers, providing they are put into the root house right. They should be put in dry and clean and in bins five feet square and five feet deep. Keep the root house well ventilated and at a temperature of 36 to 38 degrees. 36 to 38 degrees.

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To grow roots successfully do not fail to observe the following : The first day you can see the young plants up in the rows and the soil is dry pass a hand plants up in the rows and the soil is dry pass a hand wheel hoe along every drill, loosening both sides at once very close to the row, allowing the air to get into the hard packed soil. This will also kill all the weeds that have started. I have often found it well to pass over the drills twice with the hand wheel hoe before the plants are high enough to use the horse cultivator. This is the point where so many fail in growing roots. They allow the plants to get high enough for the horse cultivator to work and at the same time the weeds have grown equally as well, when it costs three times as much to hoe and thin the plants, besides the great loss or draw-back in growth of the crop. By this plan of close and thin the plants, besides the great loss of draw-back in growth of the crop. By this plan of close cultivation, thinning is made an easy matter, and the crop requires less hoeing. Keep on the horse cultivator at short intervals when the soil is dry whether there be weeds or not as long as you can get through the rows, and in no case allow the soil to roll against the roots, as covering the roots will stunt their growth.

# Hay Growing and Seeding Operations.

BY W. A. HALE, SHERBROOKE CO., QUE. Living as I do within two miles of a city where Living as I do within two miles of a city where manure can be bought for 50 cents a heavy two-horse load and five to six tons of it delivered by one man in a day in the fields, I am at present making hay my principal market crop, selling it loose, delivered in the city. Therefore my main method of rotation is not altogether what I should recommend for ordinary mixed farming, as I have recommend for ordinary mixed farming, as I have no silo, and do not now grow roots in the large quantities that I once did. In the hay meadows I maintain their fertility principally by top dressing, allowing at the rate of five tons of good manure a year to the acre, but this proportion is put on at different periods as the soil and season seem to demand. Frequently, enough for five years is put on and harrowed in at the time of sowing the grain (oats. 34 bushels to the acre I usually seed down on and harrowed in at the time of sowing the grain (oats, 3½ bushels to the acre I usually seed down with), or if the soil is in good heart and the meadows simply require re-seeding (timothy is apt to run out on our soils in five years, some suppose from using dull knives in the mowing machines). The lea is plowed deeply, oats and grass seed sown in spring. The question of rotation is too impor-tant to be treated properly in a short article. Wheat is but little grown here. Of oats, the Amer-Wheat is but little grown here. Of oats, the Amer-ican Banner I find the best all round; barley, the two-rowed Chevalier; and of field peas, the Prince Albert. Hay for market should be timothy, or with a slight mixture of Alsike clover. In Boston with a slight mixture of Alsike clover. In Boston they prefer timothy with one-third red-top. For home use, particularly for dairy and fattening stock, I prefer orchard grass, June grass, June clover, and Alsike cut early, even earlier than what is called early cut hay, and timothy, Mammoth clover, 3 lbs.; Alsike, 3 lbs. to the acre. For immediate pasture, 4 qts. timothy, 1 bushel June grass, 3 lbs. Alsike, and 3 lbs. White Dutch clover. Barley preferred for seeding down, next oats, if sown early, sow and cover with light harrow after the grain has been harrowed in. then harrow after the grain has been harrowed in, then roll thoroughly, or if a seeder is used roll without harrowing. For keeping up the fertility of the soil I use ordinary manure, piled first so as to rot before spreading, and so prevent many weeds from seeding, and for root crops other than potatoes, turn the manure once before spreading. Hardwood ashes and clover plowed under I find very profitable. In using ashes, they seem so peculiarly adapted to clover that I would spread them on the grain at time of seeding down, but with little or no hopes of any benefit the first year, but for three or four years afterwards ashes will show their benefit on clover in a way that nothing else will. Save the ashes, and do not let our American cousins buy them, even at 25 cents a bushel ! To keep free from weeds, hoed crops, the use of a weeder [Note.—Such a weeder as that advertised by Maxwell elsewnere in this issue. EDITOR, and by early plowing, cross harrowing in the spring with a disk or spring-tooth harrow, and again harrowing in fine weather before sowing barley, I have subdued a market garden that had been given up to weeds. For preserving moisture I find that by Maxwell elsewhere in this issue. -EDITOR], and

grain fields that have been well rolled in spring and hay fields that have been top dressed in the autumn suffer less than those that have not, while for root crops constant shallow cultivation in dry weather has a wonderful effect.

I have never yet thought it necessary to treat seed oats, wheat or barley for smut, nor field peas for bugs, depending on clean seed to start with, and to prevent scab in potatoes I avoid planting on the same ground without four years intermission, and select a coil as free from moisture or a clay and select a soil as free from moisture or a clay mixture as possible, and use manure that is not too strong in nitrogen.

### Ontario Agricultural and Experimental Union Co-operative Experiments in Agriculture.

To the Editor FARMER'S ADVOCATE :

SIR,-Upwards of 1,000 varieties of farm crops have been tested in the experimental department of the Ontario Agricultural College, Guelph, within the past twelve years, and 600 of them have been grown for at least five years in succession. Nearly all the Canadian sorts, and several hundred Nearly all the Canadian sorts, and several number new varieties imported by the Experimental De-partment from different parts of Europe, Asia, Africa, Australia, and the United States, have been included in these carefully conducted experiments. Some of the new varieties have done exceptionally well and have already been distributed over Onwell and nave already been distributed over Un-tario, through the medium of the Experimental Union, with very gratifying results. The Siberian oats, Mandscheuri barley, Herrison Bearded spring wheat, and the Mammoth Cuban Yellow Dent, Wisconsin Earliest White Dent, and the Salzer's North Dakota varieties of corn, which are now becoming so popular in Ontario, were imported by

becoming so popular in Ontario, were imported by the Experimental Department, and after being thor-oughly tested were distributed in small quantities. The present system of co-operative experiment-al work in agriculture was started in 1886 with 60 plots, which were situated on twelve different farms in Ontario. Since that date, however, the work has increased from year to year, and in 1897 there were 11,497 plots, which were situated on 2,835 farms. 2,835 farms.

Interested persons in Ontario who wish to join in the work may select any one of the experiments in the work may select any one of the experiments for 1898, and inform the Director at once of the choice made. All material will be furnished en-tirely free of charge to each applicant, but he will be expected to conduct the test according to the in-structions sent with the seed, and to report the results of his test as soon as possible after harvest

- LIST OF EXPERIMENTS FOR 1898.

- LIST OF EXPERIMENTS FOR 1898. 1. Testing nitrate of soda, superphosphate, muriate of potash, mixture, and no manure with corn. 2. Testing nitrate of soda, superphosphate, muriate of potash, mixture, and no manure with mangels. 3. Growing three leguminous crops for green fodder. 4. Growing three mixtures of grain for green fodder. 5. Testing four varieties of millet. 6. Testing four varieties of grasses. 7. Testing four varieties of clovers. 8. Testing three varieties of spring wheat and one variety of spring r76.

- Testing four varieties of barley. Testing four varieties of barley. Testing four varieties of oats. Testing three varieties of beans. Testing five varieties of beans. Testing four varieties of carrots. Testing four varieties of mangels and one variety of sugar beats. Deets. Testing two varieties of Swedish and two varieties of fall turnips. Testing six varieties of corn.

17. Testing six varieties of corn. Material for either No. 1 or No. 2 experiment will be sent by express, and for each of the others by mail. The supply of material being limited, those who apply first will be surest of obtaining the desired outfit. It might be well for each appli-cant to make a second choice for fear the first could not be granted. could not be granted. Particular varieties need not be mentioned, as all the kinds to be distributed are those which have done exceptionally well upon the trial plots in the Experimental Department. C. A. ZAVITZ, Director, Guelph. Agricultural College, March 21, 1898.

been out a cent for repairs in the two years that I have been running my engine. It occupies but little space on the barn floor, and there is no danger little space on the barn hoor, and there is no danger of firing the hay or straw, or any litter that may accumulate around the engine. As to cost of run-ning, this item does not foot up very much, as no engineer is needed, and the cost of fuel or gasoline is only fifty or seventy five cents a day, according to the amount of power necessary to speed up the mato the amount of power necessary to speed up the ma-chinery you have in operation. It does not have to chinery you have in operation. It does not have to be very large. A two-horse power engine would do for a small farm. I would always have an engine on trucks, so that it might be easily shifted about the barn or to different parts of the farm. The two-horse engine being small, I would mount on run-ners, as two horses could draw it easily about from place to place when needed. We know there are place to place when needed. We know there are many farmers who would buy a power for home use if they were sure they were getting a good, cheap, safe and reliable machine. I will only add that if you select a reliable make of gasoline en-gine you will make no mistake, and after you get you will wonder how you got along without it.-W. W. S., in Prairie Farmer.

APRIL 1, 1898

## Regulation of Sex.

The problem of regulating the sex of domestic animals at the will of the breeder is one which has engaged the attention of scientists and experi-menters for centuries with very meager results. Many theories have been advanced, with more or many theories have been advanced, with more or less confidence and assurance, but in practical application we apprehend the exceptions to the rule have proved so numerous as to cast grave doubts upon their reliability, and the mystery seems as far as ever from being revealed. In a late doubts upon their reliability, and the mystery seems as far as ever from being revealed. In a late number of that excellent English journal, the *Farmer and Stock Breeder*, Mr. C. T. Fields-Clarke, F. S. I., M. S. A., discusses the subject in a lengthy r. S. I., M. S. A., discusses the subject in a lengthy article, and arrives at a conclusion which seems to be tolerably satisfactory to himself. From this article we quote the following : "The subject of generation and of its ally, repro-

duction, with the question of sex is an interesting duction, with the question of sex is an interesting one, and has justly engaged the attention of savants of all ages from the earliest times until now—from Aristotle and Pliny to Huxley and other scientists of our day. Interesting as the sub-ject is for its own sake, it is, of course, doubly so when research is rewarded by practical results likely to tend to the convenience or profit of any class of the community.

class of the community. "An experience extending over many years in the breeding of horses and cattle has led me to the conclusion of our ability to regulate sex in offspring. Although the knowledge of the matter has required much time, patience, and labor to acquire, a very short space will suffice to explain clearly the modus operandi required, and very little time will be necessary to understand the

principle fully. "Now, it is generally known that mammalia possess two ovaries, in which the ovum or egg is produced. For distinction these ovaries may termed right and left. As a rule, horses and cattle give off one ovum only, alternately from the right and left ovary at each menstruation, the sex being determined by the particular ovary from which the ovum emanates, and is in no way affected by male

fluid, except as a germinating element. "What I wish specially to record is that one ovary contains male eggs only, and the other female eggs only, and the development or otherwise in either or both of the ovaries is affected more or less by the various influences mentioned in the preceding paragraphs by the authorities quoted, particularly food and temperature. Take sheep. It is an indisputable fact that ewes are

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portant bear dairyman's I is one of the Ontario chee a late issue Instructor in haulage of m ages a cost t cent per pour twice that an pointed out saved in hau Each factory tory and wi still further reason of th What is tru equally well portable proc haulage and

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### Gasoline Engines on the Farm.

For a good many years I was unable to decide what was the best farm power or what was most convenient and economical to operate such machinery as we needed on the farm. I have tried in turn tread and sweep powers, steam engines, and lastly, a gasoline engine. Two years since I purchased a six-horse power gasoline engine, and can now say that it fills the bill exactly—just what every farmer should have who shreds his fodder and grinds feed in sufficient amount to justify the outlay of money on a good power. During the year I shred from forty to sixty acres of corn fod-der, cut oats, grind feed and a few tons of bone meal for myself, and do a good deal of grinding for neighbors. With a convenient power I find that I use it much oftener than I did powers that took considerable time to get them ready for business.

I cannot imagine anything more convenient than a gasoline engine for use on the farm, unless it would be a perpetual motion. At any time, day or night, hot or cold, I can go into the barn, and without so much as even striking a match, have my

more susceptible to conceive when in an improving condition, or in other words, the ovaries have been called into activity by the improved change in condition.

"I am convinced (setting aside freaks in nature) that the left ovary contains the female ovum, and the right ovary the male ovum, and that the first ovum which escapes into the uterus at the age of puberty is from the right or male ovary, and at each succeeding menstruation the sex of the ovum alternates.

"Further, if two ovum are given off from the left simultaneously twin females result, vice versa from the right ovary ; or, if the right and left give off together twins of different sexes appear, assuming, of course, they are attacked and fecundated by the spermatozoa of the male. My greatest difficulty has been in fixing what sex the first foctus would be, knowing that the young animals have menstru-ated ovum many times before fecundation has been permitted. After the first foctus has been detarmined the reculation of say is then a matter determined the regulation of sex is then a matter for careful observation. Take a concrete case. Suppose a cow to be fit for the bull shortly after her first or any calf, and the calf in question is a bull calf, and it is desired to reverse the sex at the next calving, then fecundation should be effected at the 1, 3, 5, 7, or any odd number of menstruations after calving. If, however, it is desired to repeat bull calves, then fecundation should be effected at 2, 4, 6, or any even number of menstruations after calving. The principal point to grasp is that each menstruation changes the sex alternately.

"The persistent manner in which nature has responded to this rule, as vouched by experiments extending over many years with large herds and studs, leads me to claim it as one of nature's un-erring laws. What is more, the children of Adam