

Oregon Agricultural  
Experiment Station.

Bulletin No. 35. - March, 1895.



Agricultural Department.

**I. FORAGE PLANTS.**--(a.) Clover. (b.) Vetches.  
(c.) Flat Pea. (d.) Corn.

**II. PIG FEEDING.**

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## INTRODUCTION.

BY H. T. FRENCH.

As extensive wheat farming gives way to a more intensive system of farming, the attention of farmers will be turned toward better fodder plants, than those found on the farms throughout a large portion of the State.

Stock raising must go along with any system of intensive farming. The coarse products of the farm must be converted into meat and dairy products, and thus returning a large portion of the fertilizing elements to the soil.

At the present time considerable attention is being directed toward the dairy industry, as a source of revenue on the farm. And that a better knowledge of some of the common forage plants may be obtained, the following report is made.

It is an indisputable fact, that many dairy enterprises have met entire failure, because there has not been enough attention given to supplying the stock with suitable food during times of scarcity.

The natural pasture will supply an abundance of food during a portion of the year, although it is many times inferior to the artificial supply, or that which is raised by cultivation. As long as the dairy-men depend upon natural pasturage, they will not make the most of the opportunities that are so richly bestowed throughout a large portion of the state. It is only in the most favored localities that natural pasturage will pay. We hear the early settlers tell of the luxuriant vegetation which covered the hills and valleys during the pioneer days of the State, and some think it strange that the hills can not be induced to renew their verdure, and again be covered with a coat consisting of the native grasses and plants.

The native or wild grasses, which once covered the hills and valleys, have vanished never to appear again. They have gone out with the native red man never to occupy the land again. This fact is proven in the agricultural history of the older portions of this country, and in the countries of the old world. The crops

of to-day, in these localities, are such as have become developed, and domesticated from the wild species found, often in foreign lands. As the imported breeds of stock are superior to native stock, in many cases, so are the grasses and forage plants, coming from foreign soil better adapted to modern agriculture.

It is not our intention to ignore the natural pasture where a variety of nutritious grasses are found. Such a condition is very often a source of profit to the stock raiser and the dairyman. It becomes too expensive an operation however where land becomes valuable. It requires too much land to support a single animal.

It is not an uncommon sight to see farmers mowing native meadows that do not yield more than one ton of inferior hay per acre. Many of the native pastures do not average a cow to five acres, and some men of authority on the subject put it one cow to ten acres. Oregon has out-grown this method and should take a step upward.

It is the object of this bulletin, to mention some of the forage plants which have been tested on the Experimental grounds, and on the College farm. In all cases, except the flat pea, the plants have been used for several years in a practical way, as well as in certain experiments.

### Clover.

The first in the list is clover. Clover is king where it can be grown successfully, and that will include a large portion, if not all of Oregon, west of the Cascade mountains. It has been successfully grown in several parts of Eastern Oregon; but our observations do not cover that portion of the state.

Many native clovers are found widely distributed over the western part of the state, and several of these are valuable for hay and pasturage.

#### COMMON RED CLOVER, (*Trifolium pratense*.)

This clover needs no description. It is common in several portions of the state, especially in the northern part of the Willamette Valley. It will become much more common, when its merits are more thoroughly known. Clover has been a blessing to many localities in the Eastern States. Without clover, it would be impossible to maintain the fertility of the soil and feed stock

profitably. To remove the clover crop, would be to remove the very foundation of all successful farm operations.

As a fertilizer clover has no equal. It has been termed "the red plumed commander-in-chief of all the manurial forces," but it is not the purpose of this bulletin, to speak of it in this connection, however important it may be.

Red clover has been grown successfully, on the experimental grounds and on the college farm, for the past three years. The raising of clover has ceased to be an experiment with us. The first attempts to get a seeding were not wholly satisfactory, but for the past two years there has been little difficulty in this direction. Several crops of young clover were destroyed by the dry weather of July and August. In these cases the seed was sown in the spring, upon fall wheat. Many farmers are successful in seeding to clover in this way; but our soil is not in sufficient good tilth, to warrant a catch when this plan is followed. Later, after several crops of clover have been grown it may be possible to obtain a stand in this way. When the ground becomes more open and porous the young plants will make sufficient growth to withstand the drouth of the following summer.

The best results have been obtained by sowing in the fall before the rains begin. The land, where clover is to be grown, is plowed in the winter or spring, and thoroughly summer fallowed by cultivating several times during the summer. In this way the weeds will be destroyed. As the seeding time approaches, the surface is worked as fine as possible, and the seed is sown in September, at the rate of 10 pounds per acre. It is a good plan to mix six pounds each of Orchard grass and Tall Oat grass with the clover. Sometimes we use two quarts of timothy seed in the mixture. The Orchard grass and Oat grass, help to hold the clover up later on, and they mature at the same time as clover making very good hay.

Some experimenters claim that Tall Oat grass is not readily eaten by stock, but we have not had such an experience. Stock are very fond of it, when mixed with clover. Orchard grass is a very valuable grass when cut before it becomes too ripe. Mr. I. A. Cole says of this grass, "After twenty years experience I have settled down upon Orchard grass as possessing greater merits than any other for both the pasture and meadow for fattening animals or for the dairy stock. When cut for hay, just before

its bloom and cured with as little sun as possible, it will make more milk than any other variety known to me."

The timothy does not mature as soon as the clover; but it will add something, and help to make a variety which is an advantage in any hay.

The advantage of sowing the clover in the fall, without a crop of grain is that, if the winter is not too severe, a good crop of hay may be cut the first season; and there is no danger of the plants being killed by the dry weather during the following summer. If the seed is sown at all in the spring, the best plan is to sow a mixture of grasses and clovers, without any other crop. If grain is sown with the grass seed there is danger of the stronger growing grain plants taking all the moisture away from the clover and grass, so that when the grain is cut, the grass and clover will be burned out by the extreme heat to which they are exposed.

#### GYPSUM AS A FERTILIZER FOR CLOVER.

Gypsum has been found highly beneficial to clover. In experiments carried on for two succeeding years on small plats, the yield was increased, by using gypsum, from 20 per cent to 200 per cent over the yield from plats where no fertilizer was used. The great difference in increase was due to the variations in time of sowing the fertilizer. When sown on clover late in the season, very little effect was noticed. The best results were obtained, when the fertilizer was sown prior to March 15th. There must be plenty of moisture to take it into the soil, and thus render it available for the use of plants. It must be brought in contact with other substances in the soil also, before the best results will be realized.

It is used on the College farm at the rate of 75 to 100 pounds per acre, applied in fall or early winter, after the clover is seeded. The second year it may be applied later in the season, say in January or February.

#### YIELD OF CLOVER HAY.

The yields of clover hay obtained on the experimental grounds, and on the farm, are very flattering indeed. In 1893, a twenty acre field yielded 69 tons, by actual weight. The same field, in 1894, yielded 60 tons. This is from one cutting. The second crop is usually well filled with seed; but we have never made any attempt to save it, from the fact that there are no machines for cleaning the seed in this part of the state. Threshing ma-

chines are sometimes used, but no one seems to know how to operate them for this purpose.

#### MAKING CLOVER HAY.

In making clover hay some pains must be taken to prevent a serious loss. The leaves of the clover will dry much quicker than the stems; and if the hay lies spread on the ground until the stem is dry, the leaves will be lost. The best plan is to rake it up just as soon as it is thoroughly wilted, and put it up in not too large piles, where it will cure in good weather, in from 24 to 36 hours. It is not a good plan to let it stand too long before hauling it into the barn. It may be a little tough, and apparently too wet to keep in the mow; but if there is no rain or dew on it, it will suffer no harm if packed closely in the hay mow. Do not throw open the barn doors to let in air. Keep the air away from it, and there will be no white mould or musty hay when removed. The theory of throwing open the barn doors, to admit air to the hay has long since been exploded. It is no longer practiced by modern hay makers. Some farmers salt the hay in the mow. We do not, we prefer to salt the stock by hand as often as desirable.

#### KIND OF SOIL FOR CLOVER.

While a calcareous soil is best adapted to the growth of clover, it will grow upon a soil which has a comparatively scanty supply of lime. Clay loam seems to favor its best development. There seems to be lime enough, in either the white land or the dark soil of the Willamette valley, for its development. We have grown it on both these soils with great success.

It requires considerable potash; but this is found in most soils in sufficient abundance, especially if gypsum is present to assist in setting the potash free.

The white land, where water does not stand on the surface too long, produces large crops of clover. Better results are obtained however when such land is tile drained.

#### CLOVER FOR GREEN FEED AND FOR SILAGE.

Clover makes good silage, when properly managed. It can not be handled as easily as corn, from the fact that it will not pack as closely in the silo. It is more difficult to exclude the air. It must be very green when cut for silage, and it is better to run it through a feed cutter the same as corn. We have had a very good sample of clover silage made from whole clover; but there

was considerable loss about the walls, and in the corners of the silo. Water is sometimes put into the silo with the clover, so that it will pack more closely and keep more moist. Our silo was filled during rainy weather, hence there was no need of adding more water. The water ran from the loads as they were drawn into the barn. There is one advantage in placing it in the silo and that is, the rainy weather does not interfere with the work. Sometimes the wet weather continues so late, that the clover gets too ripe to make good hay. If you have a silo it can be cut any time you wish.

As a soiling crop, or cutting for green feed, clover is one of the most valuable crops grown. It is ready to cut May 1st., and will keep green, in favorable seasons, until July. The crop keeps green much longer here than in the Eastern states, where there is more dry weather at this season of the year.

#### INSECT PESTS.

Only a few reports of insect pests attacking clover have been reported to the Station. The clover root borer has done some damage in some portions of the Willamette Valley; but its depredations have not been serious. The clover mite is also here, but has not done any special damage as far as known.

The pocket gopher is the most annoying pest we have to contend with. In two or three years, they will establish themselves very thoroughly in a clover field, and do considerable damage. Besides eating the roots of the plants, they throw up mounds of earth which hinder the mowing machine. These pests can be poisoned in the winter by placing in their burrows pieces of potato, which have been charged with strychnine. The most efficient remedy tried so far however, is a shovel, small dog and man, when the ground is full of water as it is many times in the winter. The high water table drives the gophers near the surface, the dog will scent them, and with a little help will soon bring them to the surface. In this way over sixty were destroyed in one field in a few hours. This will only work in localities where the soil fills with water.

#### ALSIKE CLOVER (*Trifolium hybridum*.)

Many questions have been asked regarding this clover, hence we will make a few remarks upon its growth, as noted on our experimental grounds and on the farm.

This clover is intermediate between the red and white in



appearance. It matures later than the red, and, in this locality, this feature is a marked advantage. The first crop is so late, in maturing that it will not make a second growth. It is better adapted to low lands than the red clover. In our experiments it has done well on the white land. We would not recommend its use, except in mixtures with other clovers and grasses.

#### MAMMOTH CLOVER (*Trifolium medium*).

The same objection to alsike clover, will hold good with this. The clover resembles the common red except it is later to mature, and its leaves and stems are covered with a woolly substance which makes the hay too dusty for horses. For pasturage the plant has some advantages, making a stronger growth than the common red. This fact is not so important in the clay loam soil of the valley; for such soil will produce sufficient growth of the smaller varieties. For a light sandy soil the mammoth has some advantages over the less vigorous varieties.

#### WHITE CLOVER (*Trifolium repens*.)

This is valuable for pasturage, and is found in most localities of the state in considerable abundance. It is a good plan to sow white clover in a mixture for pasture, especially on new land or low wet lands. It makes a good sod, and furnishes considerable forage.

#### CRIMSON CLOVER (*Trifolium incarnatum*.)

Much interest is manifested in regard to this clover, and from plat experiments the writer is led to believe that it will be a success in a large portion of the Willamette valley, and along the coast where the winters are not so severe. It has been grown in plats two years, making a good yield. This season we have two acres on the farm for a more thorough trial. Our climate is very similar to that of other portions of the United States, where it has been such a marked success.

If sown in September, on carefully prepared land, a full crop of two or three tons of hay per acre, can be cut the following season. It will not last as long as common red clover. One crop is about all that will pay from one seeding. The second crop is very light.

## Vetch or Fares.

This is a leguminous plant, which has been used for a long time as green food for stock. It has not been fed as extensively in this country as in the European countries. In France and England, the vetch has been grown for stock food, for many years, and forms an important factor in furnishing forage for stock.

There are several species which are found growing wild in Oregon. Some of these furnish valuable pasturage, and others are considered as pests, especially in grain fields. The question has been asked very often, if this domesticated vetch will not become a pest, and thus do more harm than good. It is the opinion of the writer that it will not, any more than tame clover will become a pest. It is an annual, or in other words grows from the seed every year, hence there is little danger of it becoming troublesome, if the farmer is reasonably careful.

This plant resembles the wild pea, which is found in such abundance in the mountain ranges, especially in the coast range. It does not belong to the same genus however, but is closely related. There is a spring variety which is grown in the Eastern States, and in Canada, with more or less success. The variety that we are discussing is called a winter vetch; but it will mature when sown as late in the spring as April; if sown at that time the crop will mature in August or September. The most common practice is to sow the seed in the fall or winter, and then the crop will be ready to begin cutting for green feed in April or May.

The plant grows best on an open rich soil. It has been grown very successfully on the red hill land of the coast mountains, and it promises to become a very valuable forage plant for such localities. One and one-half bushels of seed is sufficient for one acre. It is a good plan to mix  $\frac{1}{4}$  bushel of wheat or rye with the seed to hold up the plant when growing. It will make four or five feet, and often more growth, in one season. If there is no grain with it, the vines will fall over thus making it difficult to harvest.

We have found it valuable for all kinds of stock. It has been fed to horses, cattle, and pigs with the greatest satisfaction. For horses it has been cut and fed green, during the summer, with very flattering results. One farmer, whom we furnished

some seed for trial, said that he had never had his horses do so well, during the working season, as when they were fed the green vetch. Some grain should be fed with it, although in the case mentioned no grain was used. As a green forage for cattle, especially dairy stock, it has given the utmost satisfaction. It is greedily eaten, and furnishes a highly nutritive ration.

It has been used for silage on several farms in the valley, and has given satisfaction, when properly put up. It does not keep in the silo quite as well as corn. It is more difficult to pack it closely enough to exclude the air.

The yield per acre will not ordinarily equal that of corn; yet at the Station, we have secured 19 tons per acre at one cutting. This was on good strong soil; but without any special culture.

As a food for pigs, it has been highly satisfactory. Some experiments were conducted in 1894, to determine its value for this purpose. The results will be found under pig feeding experiments. As a crop for hay, only a partial report can be made. During the summer of 1894 several loads of vetch hay was made for the purpose of testing its value when dry as, compared with clover. The vetch was cut with a mowing machine, when in full bloom, and cured with the same precautions taken, as in curing clover. The hay resembles alfalfa when dry, so much so that several people mistook the material for alfalfa. Experiments are now going on in testing its value as compared with clover. So far we can only say that the dairy stock, and steers which are being fattened are exceedingly fond of the hay. They seem to prefer it to good clover hay. The results of the experiments will be published later.

In procuring seed, we have always let the first crop mature; but if the first cutting is made early, say in April or May, the second crop will produce an abundance of seed. In saving seed, great care should be used to handle the material while damp, for the seed shatters out very easily. If the pods get wet, and the sun dries them again, they will burst open, and the seed will be lost. On this account it is better to let it cure in small piles, and thereby less material will be exposed to the sun and dew. The seed can be threshed with the ordinary threshing machine, although it is rather slow, and some care must be taken not to cut the seed too much.

In conclusion we would say that, from experiments carried out on the Station farm, both in a practical way, and as mere experiments, the vetch is a valuable forage plant for a large

portion of Oregon. The climatic conditions, and the soil seem to be very well adapted to its growth; and the needs of the farmer demand just such a plant as this proves to be.

### Flat Pea (*Lathyrus sylvestris*.)

This somewhat noted forage plant is being tested on the experiment grounds, first to determine whether it is adapted to our soil and climate, and later to determine its food value. The first question is pretty well settled; for it found that, after two years trial it grows very luxuriantly. It starts slowly at first making 8 to 10 inches growth the first year, and the second year 4 to 5 feet. It roots very deeply, thus being enabled to withstand the drought with impunity. The dry weather of July and August, serves only to make it grow the faster. The vines will stand considerable frost, and are said to be valuable for food, even after the frost has killed them.

The plant is a perennial, the roots standing an unlimited time when once thoroughly started. The wild plants, from which this was developed have stood, it is said, for 60 years without renewing. The young plants should be cultivated to keep the weeds down during the first year; after that they will take care of themselves. On this account the seed is sown in drills two or three feet apart, and if the soil is rich, the more rapidly the plants will get beyond injury from weeds.

The chemical composition of the flat pea vine is similar to that of clover hay: It can be cut several times during the season, and fed green, or be made into hay. The following report, regarding this plant was made by the Director of the Michigan Experiment Station, in 1893:

July, 1893.—“Those who have walked through the station field since the first of June, cannot fail to have noted the very luxuriant and beautiful plat of more than an acre in extent of the new forage plant *Lathyrus Sylvestris*. It started early in the spring, every root having endured the severe cold of winter without injury. The tops were uninjured last fall by the severe frosts. They did not stop growing until heavy freezing came. Indeed, where there was quite a covering of tops and the snow fell early and remained on the ground, those sprouts on the under side at the surface of the ground were not killed by the freezing of winter, but remained green until the plants began their new growth this spring. The whole field started early and made a green and beautiful appearance. Then came on a long spell of cold and windy weather, which kept everything back,

hence it was not until late that the plants got down to work. Since then it has let itself loose, so to say, and grown in a reckless but determined fashion. Every root sent out numerous shoots that spread away on every side until the ground was covered with a dense mass. Then it began to climb up. The tendrils of one shoot caught on to all the neighboring shoots, and by June there was a deep garment of verdure more than three feet in depth, which yielded at the rate of sixteen tons of green forage per acre. Cured it made at the rate of four tons of choice hay per acre. The forage is eaten eagerly by all kinds of farm stock. Not only does it enrich the soil, but it is able to flourish on very poor soil. Our flat peas were sown on the most sandy soil of our farm. When one sees the freshly dug plant, with its hundreds of tubercles, he feels sure that if any plant can enrich the soil this one can."

Whether the plant will give such flattering results here remains to be seen. We are in hopes, that it will be sufficiently hardy, to maintain itself on the hill land; and thus a large area of now almost barren land will be made productive, for pasturing purposes.

The seed of this plant can be obtained of nearly all seed dealers, and the price is fast coming within the reach of all who wish to give the plant a trial. When first introduced into this country, four or five years ago, the seed sold for ten dollars per pound. We were able to gather our first seed last season, and this we will use in extending the experiments.

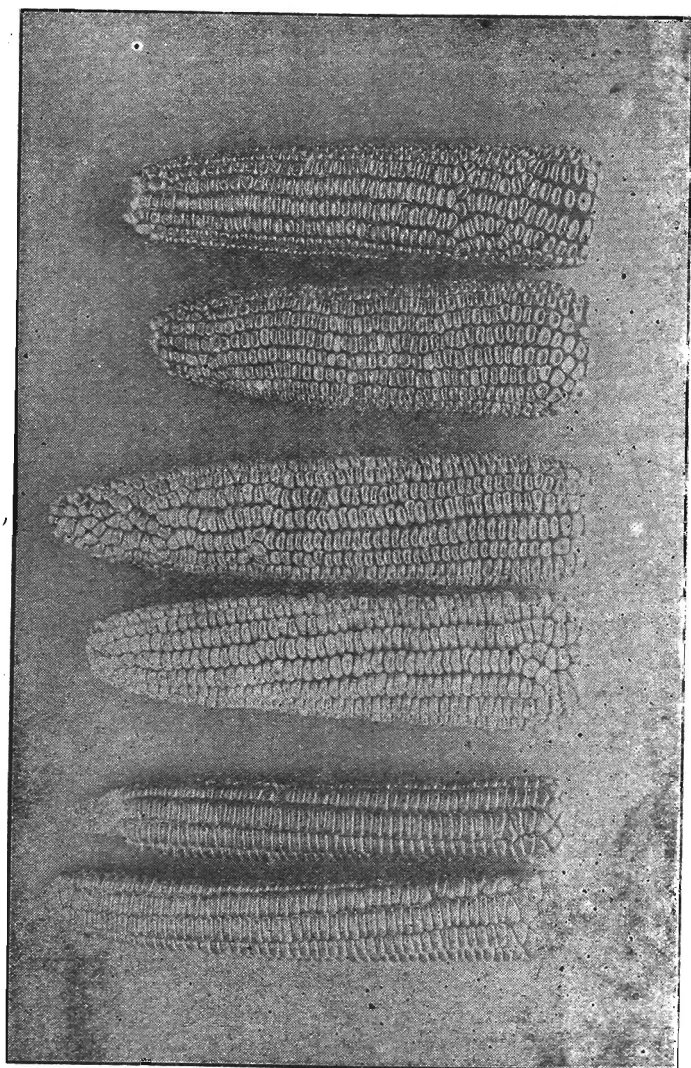
### Corn.

In discussing corn as a forage plant we shall reaffirm what we have said in former bulletins, regarding the value of this crop to the farmers of Oregon.

There is a quite common expression, often heard at Farmers' Institutes, and in private inquiries, that corn cannot be profitably grown in the Willamette Valley. After five years of trial, during which time the crop has not failed to make a profitable yield, we are fully prepared to recommend the crop, as one which the farmer can at least well afford to test.

That the Willamette valley will ever become a corn country, like Iowa, Kansas, and Missouri, can not be expected, for the climate conditions are not suitable to that extent.

In stepping aside from the subject of corn as a forage plant permit me to say, that the Experiment Station, has been able to grow several varieties which produce as hard, well matured corn, as ever grew in the great corn states. But this is only true of the earliest varieties, such as the King Philip, a yellow flint variety, Minnesota King and Early Mastodon, both of which are yellow dent varieties. There are other varieties, no doubt, that



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PLATE I.

will ripen here, but these we have tested and find well adapted to the climatic conditions.

Nearly every farmer could use an acre or two of mature corn in the fall, in feeding pigs at the beginning of the fattening period. These varieties would be valuable also for green food, for the more grain there is with the stalks the better the feed. The later varieties, which will do for silage, are too late for early feeding, if the best results are obtained. Green slushy corn stalks, with no grain formed, does not compare in food value with more mature corn. It has been our practice for the past four years, to grow corn on the summer fallow, and the results are very satisfactory indeed. The larger portion of the corn is placed in the silo, but some of it is cut for stock during the fall. As soon as the corn is removed, the ground is ready for the grain drill, or can be made so by passing over it lightly with the harrow.

After testing some thirty varieties, the Pride of the North seems to give the best satisfaction. It is medium early and produces an ear on every stalk, and a fair yield of stalk and leaf. On the dark land, bordering on the white land, there is no difficulty in securing a yield of ten to twelve tons per acre without the aid of fertilizers. On a clover sod this yield has been increased considerably.

By storing corn in the silo, it can be used nearly, if not quite, the entire year. It has constituted the chief fodder substance at the Station, in several instances from November to July, keeping the animals in a thrifty condition. From accounts which have been kept, it has been ascertained that the corn can be grown, including labor, seed and cost of harvesting, for one dollar per ton. Many claim to have grown it much cheaper than this. It takes three tons of corn silage to equal a ton of the best clover hay, according to its chemical analysis; but in feeding the material, it may be possible to get much better results than the chemist is able to show. It is not our purpose to enter into discussion of silos at this time; but in answer to many inquiries let me say a silo can be built much cheaper here than in the extreme cold climates. Only a single tight wall is needed here, while a double wall is necessary where a zero temperature prevails during a portion of the winter.

The varieties of corn shown in cuts are No. 0, King Philip; No. 1, Forsyth's; No. 2, Bristol's 100 day; No. 3, Minn. King; No. 4, Pride of the North, and No. 5, Huron Pure Yellow Dent. No. 3 and 5 are the earliest. These reached complete maturity making sound corn. No. 4 comes next and is the best corn for silage. No. 1 and 2 do not mature sufficiently to make a good silage corn. No. 2 shows that the name of a variety may be very misleading. This corn will not mature in 100 days in this climate.

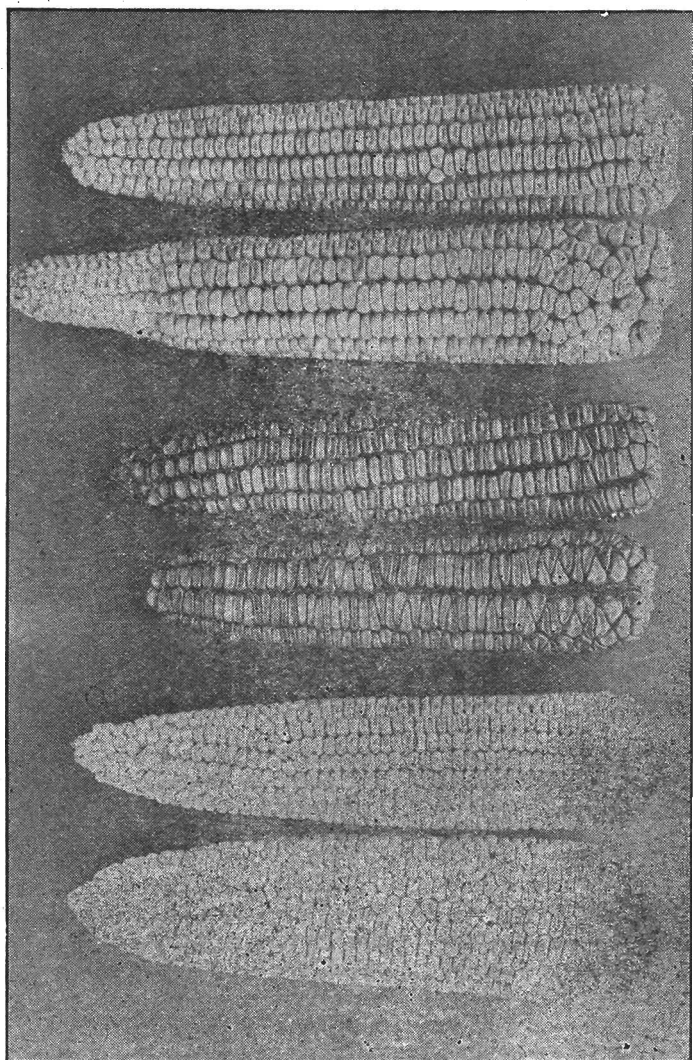


PLATE II.



## PIG FEEDING.

The experiments in pig feeding reported in this bulletin were carried on with two objects in view, viz: to repeat a former experiment, in testing the value of a mixture, as compared with a single feed; and the other to determine whether it were possible to keep pigs profitably, in pens where they would require a constant ration of grain. In discussing the subject of early maturity, the question is always asked: "does it pay" to force pigs in close quarters during their life-time. In the effort to throw some light upon these questions a litter of eight pigs was selected and the work begun. The pigs were about  $\frac{7}{8}$  Berkshire, but not an exceptionally good lot. They were farrowed Feb. 16, 1894. The pigs were weaned May 1st, and up to June 1st, when the weights began, they were fed on shorts and water, with some slop from the boarding hall. They were fed on the food mentioned above while running with the sow. June 1st, the feed was weighed to them, and the pigs were weighed in a group, as seen in the table. At the beginning they weighed 328 lbs., and gained 128 lbs. the first month, or a trifle over  $\frac{1}{2}$  lb. each per day. During this period, the pigs were turned on a patch of vetches, and were fed a pound of shorts each per day, and all the water they wanted. The yard contained 17 sq. rods of vetches. They were not given the entire yard at once, but by means of a portable fence, the yard was extended so as to keep the vetches as fresh as possible. During the next period, from July 1st to 28th, the lot gained 190 lbs., or a total gain of 318 lbs. Total amount of grain consumed, 984 lbs., or one pound of gain to 3.1 lbs. of grain. During this latter period, the pigs were fed on vetches which were cut, and given to them twice daily. There is less waste when fed in this way. In the two months, from June 1st to July 28th, the pigs ate the vetches from 30 sq. rods of ground, or a trifle less than one-fifth of an acre. Pigs are very fond of the vetch. They would very often leave their grain for the vetch. July 28th, the vetch became too dry to use, and the pigs were fed from that time till October, on shorts and water. From July 28th to August 24th, the pigs gained 117 $\frac{1}{2}$  lbs., quite a falling off due, no doubt to taking them away from the green feed. From August 24th to October

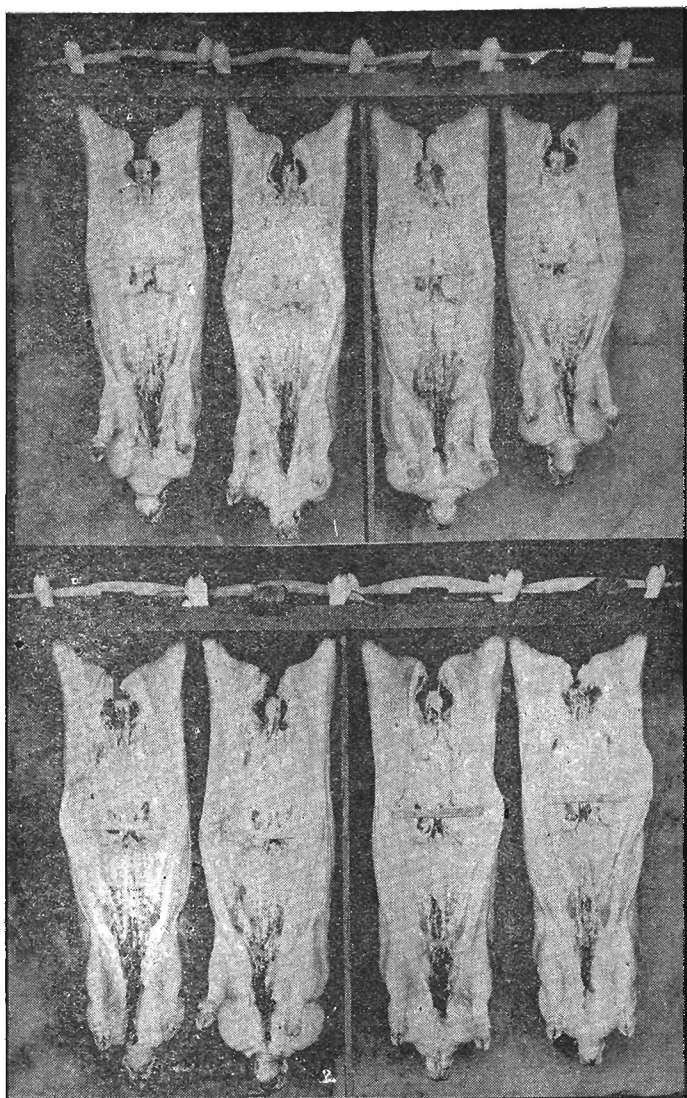


PLATE III.

1st, the pigs gained  $227\frac{1}{2}$  lbs, making a total gain, after taking off the green feed. July 28th, to October 1st, of 345 lbs. They consumed 1253 pounds of shorts, during this period, or a pound of gain was made to every 3.63 pounds of grain. This is  $\frac{1}{2}$  lb. more of grain, to make a pound gain, than when fed on vetches. While the pigs did not make such rapid gains on the vetch, they made a good growth. The average daily gain, while feeding on the vetches was .68 of a pound. These figures are not as large as we might expect, but it is much better than to barely keep up animal existence.

From May to August is a critical time with the pigs on the farms where so little clover is grown. The pigs are taken off the wheat pasture in the spring, and as a general thing are compelled to roam over scanty pastures until the stubble fields are ready for them. During this interval, the pig is likely to lose, rather than gain in weight, hence the importance of having some green food suitable for them. A good clover pasture cannot be excelled, but in many portions of Oregon, the farmer has not learned how to grow clover, and, until he does become master of the situation, some other plant must be substituted. No other plant seems to come as near clover as the vetch. We would recommend cutting it, and feeding in pens, rather than to use it for pasturage.

#### FATTENING PERIOD.

The pigs were divided into two lots, October first, and the second experiment began, viz: that of testing chopped wheat alone as compared with a mixture of grains.

Lot No. 1 was fed clean chopped wheat and water. The feed was weighed and placed in a pail with water, and allowed to stand from one feed to the next. A little salt was added to each feed. The pigs were fed at 8 o'clock in the morning, and five at evening. Charcoal and ashes were kept before the pigs all the time. They were permitted the run of a small yard, connected with the pen, except when it became too muddy. There is nothing gained by compelling, or permitting, pigs to wallow in mud, however much they seem to enjoy it.

The importance of feeding pigs from troughs, needs to be

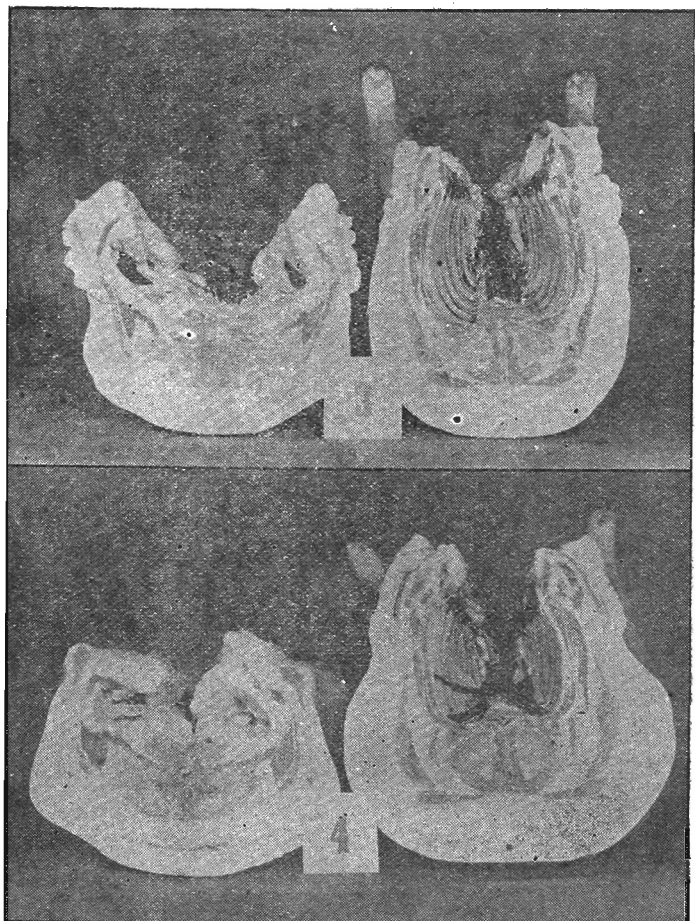


PLATE IV.

emphasized. It is too often the case that, the pigs are required to pick up the grain out of a perfect slough of mud. The pig may do fairly well; but it is not economy to feed pigs whole grain strewn on the ground, especially wheat or oats. In feeding corn on the cob there is not so much loss, but even then it is not the most economical method. Only a few dollars are necessary to provide troughs and a floor, on which to feed the pigs. The Oregon farmer has not realized the need of barns and pig pens, but as he is compelled to grow more pork, and make more butter, as a source of revenue on the farm, this need will become more apparent.

Lot No. II received the same treatment as lot I, except in the kind of food. This lot was fed on a mixture of two parts chopped wheat, one part shorts, and one part chopped oats, determined by weight. This was continued to Jan. 4th when the oats were withheld.

#### RESULTS.

By consulting the tables it will be seen that lot II made 752 lbs. or an average daily gain of 1.7 pounds each. Lot I gained 646 lbs or an average daily gain of 1.46 pounds. The pigs fed on the mixture, ate 156 lbs. more of grain than those fed on chopped wheat alone. The shorts fed to lot II was a little cheaper than chopped wheat, hence the cost of producing a pound of pork, was a little less in this lot than in lot I. The 106 pounds of gain over lot I, also assisted in bringing the cost of production down considerably. It will be noted by referring to the table giving the summary, that a bushel of chopped wheat, 60 lbs., produced 12.9 lbs. of gain in lot I. At 4 cents per lb. gross weight for the pork it would give a return of 51.6 cents per bushel for the wheat. In lot II there was a gain of 14 lbs. for every 60 lbs. of grain consumed. During the second period, table No. 2, there was a marked difference in the amount of food to produce a pound of gain, and consequently in the cost. There is one fact, which we have noticed in former reports, and that is the increased use of grain to make a pound of gain as the pigs near the finishing point, or maturity.

Tables showing results by periods of four weeks each.

TABLE 1.—FIRST PERIOD.

No. of Pig.....	Chopped wheat				Mixture wheat, oats, and shorts.			
	Pen No. 1.				Pen No. 2.			
	1	2	3	4	1	2	3	4
Date of weighing.....	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
October 1st.....	128	95	112	159	139	111	110	139
October 15th.....	154	115	135	178	172	135	134	166
October 29th.....	173½	137	150	219½	197	161	157	188½
Individual gain.....	45½	42	38	60½	58	50	47	49½
Total gain.....			186 lbs.				204½ lbs.	
Food consumed.....			723¼ lbs.				727½ lbs.	
Food for one lb. of gain.....			3.89				3.55	
Cost of one lb. gain.....			2.53 cents.				2.30 cents.	

TABLE NO. 2.—SECOND PERIOD.

No. of Pig.....								
	1	2	3	4	1	2	3	4
Date of weighing.....	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
October 29th.....	173½	137	150	219½	197	161	157	188½
November 12th.....	197	162	171½	240	223	184	183	203
November 26th.....	216	178	191	270	255	219	212	246
Individual gain.....	42½	41	41	50½	58	58	55	57½
Total gain.....			175 lbs.				228½ lbs.	
Food consumed.....			850 lbs.				905½ lbs.	
Food for one lb. gain.....			4.86				3.96	
Cost of one lb. gain.....			3.17 cents.				2.56 cents.	

TABLE NO. 3.—THIRD PERIOD.

No of Pig.....								
	1	2	3	4	1	2	3	4
Date of weighing.....	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
November 26th.....	21	178	191	270	255	219	212	246
December 10th.....	233½	193½	211	297	281	241½	236½	274
December 24th.....	257	215½	237½	326	309½	265	260	302½
Individual gain.....	41	37½	46½	56	54½	46	48	56½
Total gain.....			181 lbs.				205 lbs.	
Food consumed.....			857½ lbs.				997½ lbs.	
Food for one lb. gain.....			4.74				4.86	
Cost of one lb. gain.....			3.08 cents.				3.14 cents.	

TABLE NO. 4.—FOURTH PERIOD, OR 25 DAYS.

No of Pig.....								
	1	2	3	4	1	2	3	4
December 24th.....	257	215½	237½	326	309½	265	260	302½
January 7th.....	280	228	263	351	338	285	275	325
January 18th.....	281	236½	265½	357	340	294	285	332
Individual gain.....	24	21	28	31	30½	29	25	29½
Total gain.....			104 lbs.				114 lbs.	
Food consumed.....			621 lbs.				579½ lbs.	
Food for one lb. gain.....			5.97				5.08	
Cost of one lb. gain.....			3.97 cents.				3.22 cents.	

TABLE NO 5.—SUMMARY.

	No. of Pig.	Wt. Oct. 1 1894	Wt. Jan. 18 '95.	Total gain.	Gain per day.	Average daily gain.	Total food consumed.	Amount of food for lb. of gain.	Cost of food for lb. of gain.
	lbs.	lbs.	lbs.	lbs.					
Lot 1 chopped wheat.	1	128	281	153	1.39				
	2	95	236½	141½	1.28				
	3	112	265½	153½	1.39	bs.	lbs.		
	4	159	357	198	1.80	1.46	305½	4.72	cents.
Lot 2, mixture chopped wheat, oats, & shorts.	1	139	340	201	1.82				
	2	111	294	183	1.66				
	3	110	285	175	1.59				
	4	139	332	193	1.75	1.70	3210	4.28	2.80*

\*Chopped wheat 65 cents per cwt.; Oats 69 cents, and shorts 60 cents.

TABLE NO. 6, SHOWING WEIGHT OF ORGANS, GROSS WEIGHT, DRESSED WEIGHT, AND PER CENT OF SHRINKAGE.

No. of Pig.....	Lot 1, chopped wheat.				Lot 2, mixture chopped wheat, oats, and shorts.			
	1	2	3	4	1	2	3	4
	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.
Blood.....	5 4	4 1	4 14	5 5	7 2	5	6 6	5 6
Hair.....	3 4	3 2	3 3	3 8	3 11	4 11	3 3	5 3
Lungs.....	2 10	1 14	3 1	3 12	3 4	2 14	2 11	2 7
Heart.....	14	11	11	15	14	12	14	12
Spleen.....	4	3	4	5	6	4	7	4
Liver.....	3 7	3 6	3 4	4 4	7 4	5	5 2	6 2
Kidneys.....	5	8	6	7	7	7	10	8
Tongue.....	1	9	12	1 4	13	15	1	2
Intestines.....	22	17	17 8	18 10	17 1	17	19 6	15 4
Fat from Intestines..	7 14	4 6	6 3	9 11	8 13	7	7 9	8
Leaf fat.....	12 6	7 4	9 2	13 6	12 12	11 2	11 4	11 11
Gross weight.....	251	236½	265½	357	340	294	285	332
Dressed weight.....	229½	194¼	219¾	289	284	242	232½	278
Per cent shrinkage...	18.5	17.7	17.6	19.	16.4	17.7	18.5	16.2
Average per cent shrinkage			18.2			17.2		

If the pigs could have been slaughtered four weeks earlier the results would have been a little more favorable. There is nothing gained by keeping pigs beyond the growing period. When they cease to grow the profitable feeding period has passed. This is a strong point to consider for those who grow the pigs, and then fatten them. From Oct. 1st to 30th, was the most profitable period.

By referring to cuts, page 50, it will be seen that the pigs of lot II were more uniform in size. This was partially true at the beginning, there being one in the lot a few pounds lighter than the others. The pigs fed on wheat alone were much more sluggish in their habits. They did not move about with as much ease as the other lot.

In table showing weight of organs, there is a striking difference in the weight of the livers of the two lots. Lot II ranged from 5 lbs. to 7 lbs 4 oz, while in lot I the range is from 3 lbs. 4 oz, to 4 lbs. 4 oz. The kidneys of pig No. 1, in lot II were abnormally large, weighing 10 oz. They were not healthy, slight wattery tumors being found on them. There was more inside fat, in lot II, than in lot I. Of the intestines there was a greater weight in lot I, than lot II.

The carcasses were weighed, and meat photographed 24 hours after killing. The shrinkage was nearly the same in each lot.

Cuts Nos. 5 and 6 are from lot II, and Nos. 3 and 4 from lot I. The carcasses were cut through the loin, and between the fifth and sixth ribs. Cut No. 1 of carcasses hanging, is from lot I, and No. 2 from lot II.

Credit is due Mr. C. D. Thompson, who had the care of the pigs during the feeding test.

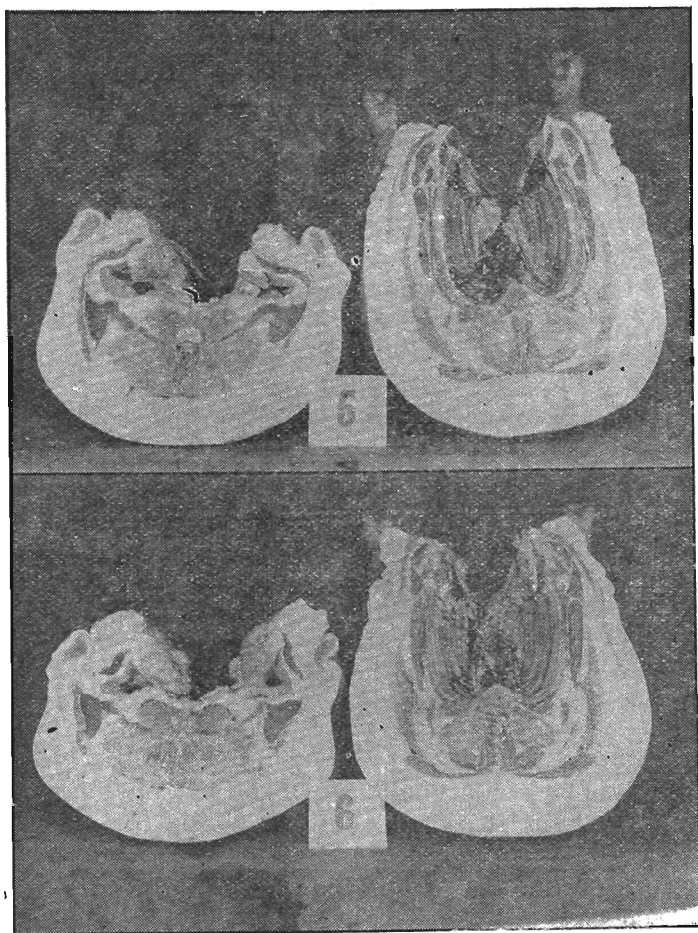


PLATE V.