FARM AND GARDEN

ROOT TUBERCLES.

Differences In the Galls Upon Pea and Wax Bean Roots.

The whole subject of root tubercles is a comparatively new one, and there is much to be found out about it. It, however, seems settled that a close relationship exists between the taking up of the free nitrogen by plants and the presence of galls upon their roots. The majority of plants do not have such root tubercles, as, for example, the cereals, potatoes and the like, while clovers and cloverlike plants are generally gall bearing where the circumstances are favorable for their formation. When a soil is rich in combined nitrogen, the tubercles are less liable to form than when the soil is poor in such substances. The host plant needs to be "hungry" for nitrogen for the full development of the tubercles. These galls are produced by micro organisms closely related to the bacteria. They make their entrance from the soil through the tender cell walls of the younger portions of the roots and induce a cell growth in the region of the invasion that results in a tubercle.

TWO PEA ROOTS SHOWING TUBERCLES.

In some unknown way the tubercle germs are able to lay hold of and adapt the free nitrogen for the use of the plant that is bearing the galls. To a certain extent the number and size of the galls may be taken as an index of the success of the plant.

There is a marked difference between the galls upon the roots of leguminous plants; for example, those of the pea are quite unlike those of the bean. This is brought out in the cuts, made from sun prints of the roots and their galls. From the great difference in size, shape and distribution, one might easily think that the galls were caused by distinct kinds of germs, but there is no marked distinction in the micro organisms when studied with the microscope. It is true that a germ that has grown upon a certain crop plant is more at home upon that kind of host. In other words, soil extract from an old pea field will produce galls upon the pea roots in new land better than upon clover or any other crop.

The foregoing illustrated talk upon root tubercles, originally given in The Rural New Yorker by Professor B. D. Halsted, leads that gentleman to a further word upon soil inoculation, as follows:

The study of the tubercle germs has gone so far that now they are isolated and sold in the market under the trade name of "Nitragin." This is a "starter" in land when the germs are not present. Very good results have come from the use of this germ fertilizer. A small bottle of it is enough to make a difference of tons of yield in certain crops, as shown by experiment at the Alabama station with crimson clover and hairy vetch. Of course, soil that contains the germs may be used in the same way, and in some instances a ton or less of old soil, where a clover or clover like crop has been grown, may be spread upon land new to the same crop there to be grown, with excellent results. During the past year, in one experiment at the Plant hospital, I found that soil from old pea land made a striking difference upon new soil, in the larger growth and deeper green color of the pea plants. The yield of pods was also increased.

WAX BEAN ROOT SHOWING TUBERCLE.

A seedsman gives the warning that as celery seed is very slow to germinate people should have patience and not condemn seed till it has had fair trial. It is sometimes more than three weeks before sprouts start, and they are then apparently very weak. A thin cloth spread over the soil and frequently sprinkled may hasten them.

LETTUCE CULTIVATION.

Rhode Island Understands the Art Well—A Few Pointers.

Formerly the cultivation of choice lettuce was confined to private gardens of small area, but now hundreds of acres planted with the most highly improved varieties receive as intensive culture as is given to any other horticultural crop. Probably nowhere else in this country is lettuce grown more systematically or better than in Rhode Island. It is upon the large vegetable farms that this work has reached its highest development, according to Professor L. F. Kinney of the experiment station of the state. In view of these facts, particular value is attached to Professor Kinney's advice on lettuce cultivation given in the last annual report of the station, from which brief extracts are here made

Lettuce plants occasionally survive the winter in Rhode Island without protection. It is noticeable that the names of inferior kinds of lettuce, which were formerly grown in this country and are still largely grown in Europe, mainly on account of their hardiness, have now nearly disappeared from the catalogues issued by American seedsmen. The Brown Dutch is about the only exception. Plants of the more highly developed kinds, which are represented by the black seeded Tennis Ball, Iceberg, Prize Head, etc., when started under glass in March and set in the field when freezing weather is mainly over in the spring mature earlier and yield a better product than plants that are started in the fall and wintered out of doors. Hardiness, or at least ability to endure extreme cold weather, is no longer regarded as an important attribute of a variety of lettuce in New England. The quality of outdoor lettuce is extremely variable and determined largely by the preparation of the soil, which must be made very rich to produce first class heads, or crisp and blanched leaves on the nonheading varieties. There is not a kind of lettuce among many varieties cultivated capable of producing a superior product on a poor soil.

Lettuce also thrives better in the cool spring and fall weather than during the summer months. Successive plantings of the seed are made from the 1st of May until July. The heads are in condition for cutting in from 12 to 14 weeks after the seed is planted, but the heading varieties do not remain in this condition more than one or two weeks before the blossom stalks start.

In quality the black seeded Tennis Ball is still the standard of excellence. It is extensively grown in market gardens. The Early Curled Silesian, or Simpson, is a popular nonheading kind, but is grown mainly for private use. The Iceberg, New York, Hanson and Deacon, all heading varieties, are grown on a small scale both for private use and for market. The merits of the Cos lettuce are not yet generally recognized. This kind seems to require even richer soil than the black seeded Tennis Ball to form good heads. When the soil is properly prepared, the heads are very large and firm, and the leaves are white, crisp and free from bitterness. The Paris White Cos is the standard variety of this class. The Trianon Cos and the Paris Self Folding Cos are slightly modified forms of the above, but are scarcely distinguishable either from it or from each other. In order to insure firmness of the heads it is customary to tie the leaves of the Cos lettuce together one or two weeks before the heads mature. This operation is not always necessary. The ordinary garden fertilizers are adapted for the production of lettuce, but two or three times as much of them should be applied as is necessary for the growth of beets, cabbages and most garden vegetables.

A Home Supply of Nitrogen.

Nitrogen is the most costly of all the manurial elements, and the farmer should seek to raise a home supply by crops of red clover, field peas, etc. The value of red clover as a manurial crop is well known, but the "catch" is sometimes uncertain. A crop of field peas with oats, hogged down in midsummer and plowed under, is a good preparation for a wheat crop, and the pigs by increased formation of muscle will get a good start toward bacon.—R. C. Kedzie.

Contrary to Popular Belief.

Corn thickly sown in an experiment at the Michigan station contained but little more water than where the stalks were larger and farther apart. It is the popular belief that where corn is planted so thick that the stalks are thereby made small and weak the crop is "watery." The results of this experiment do not confirm the belief. The corn was drilled with an ordinary grain drill, every tube sowing. The rows were therefore but seven inches apart.

Agricultural Brevities.

A bill has been prepared for the New York legislature in line with the recommendations passed at the meeting of the Apple Shippers' association. This provides that the standard or legal barrel for the state of New York shall be of a capacity of the flour barrel, or 17⅛ inches in diameter of head, 28½ inches in length of stave, and bulge not less than 64 inches outside measurement.

"The earliest potato in the world" is one of the claims made for the Early Fortune potato.

Professor Beach of New York advises that bordeaux mixture should be freshly made or not more than two days old when used.

To avoid mildew of lima beans try planting on high ground, as early as possible, and not immediately following a similar crop.

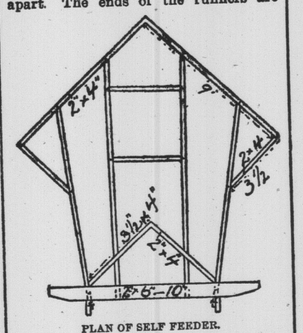
For planting where hardiness is the principal consideration Professor Waugh of Vermont recommends Yellow Transparent, Red Astrakhan, Long Field, Oldenburg, Fameuse, McIntosh, Wealthy, Scott Winter, Pewaukee and Arctic apples.

LIVE STOCK

PORTABLE SELF FEEDER.

Ingenious Structure In Use on an Illinois Farm.

C. H. Gardner of McDonough county, Ills., describes in The Breeder's Gazette a self feeder in successful use on his farm. The framework is all bolted together, as nails would not withstand the strain when pulling the feeder from field to field by four horses. The runners are made of heavy 3 by 10 oak plank, each 16 feet long, and placed 6½ feet apart. The ends of the runners are



PLAN OF SELF FEEDER.

rounded at both ends, so that the feeder may be pulled either way. Nine 2 by 4 joists each 9 feet long are bolted on to the runners about two feet apart. These joists are then fastened together by 2 by 6 joists which project over the runners far enough to support the feed trough. The trough is built about the width of a scoop. This permits of easily removing the grain from the trough should you choose to do so. This, however, is seldom done. Used in this way, however, the feeder makes a very cheap granary The bottom of the feeder is built high in the middle and slopes to the feed trough on either side. The roof projects a little over the sides and measures about 14 feet from eave to eave. A door or cover is provided at either side for the feed trough. If one has cows in the lot at night, but wishes calves to eat grain from the feeder during the day, he can simply drop the lid when the cows are in the lot and raise it on turning them out. Calves can then eat oats or shelled corn or whatever you may have in the feeder for them. Cut the rafters for the floor out of 14 foot 2 by 4's, making them each 3½ feet long. Thirty-six rafters of this sort will be needed for the bottom and the drop on sides.

After the feeder is sided up with ship lap or flooring the roof of 1 by 8 sheeting is then put on, which is afterward covered with shingles. It is a good idea to put several braces across the feeder from eave to eave. Bolt these to the upright 2 by 4's. Strength will be given to the structure by running a one-half inch rod the length of the feeder and making it fast just below the grain doors. The feeder is about 16 feet long and has a capacity of about 1,000 bushels of corn. Total cost, including lumber, labor and hardware, will be about $50 or $60. From 50 to 60 head of cattle can be fed at one of these feeders. In adjusting the slides at the feed trough I place them so that I can just run my finger under them at the bottom. The cattle then have to lick the grain with their tongue. They get but small quantities in this way and clean it up before reaching in for more. Feeding from these troughs results in their thoroughly masticating the grain. Timid cattle will come up to the trough after the fighters have had their fill.

In order to show the value of the self feeder I herewith give the data concerning the feeding of 37 head of pure bred Angus steers and heifers. They were put to the feeder filled with oats on Nov. 15, 1896, eating what oats they wanted through the day and nursing the cows at night. Dec. 15 they were weaned. In March shelled corn was put in feeder on top of a few bushels of oats. The feed then until May was oats and corn. Corn was fed from

EXTERIOR OF SELF FEEDER.

this time on until they were taken to the stock show in November, 1897 Fifteen steers, about 19 months old, were shown there. They averaged about 1,140 pounds and sold at $5.40. They dressed out 62.86 per cent beef. The remaining 17 heifers and 5 steers were shipped Dec. 14, 1897: weighed 1,045 pounds at an average age of 17 months and sold at $5.40 and dressed 62.6 per cent These two lots were fed nothing but corn, oats, hay, grass and rock salt We visited the feeder but once in ten weeks, when we put in feed, and an occasional trip was necessary to supply rock salt.

Frozen Meat.

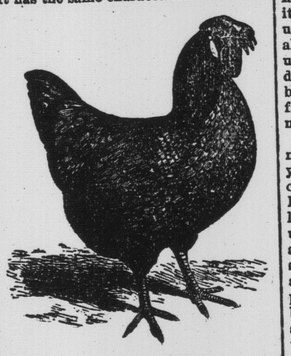
Fresh meat may, as all farmers know, be kept a long time if thoroughly frozen. It should, however, be hung in pure, cold air until a thaw comes, when it should be at once cooked or salted. Freezing the meat has opened its pores to air, and so soon as this begins to be tainted putrefaction soon sets in. Hence the pork that has once frozen through is harder to keep than that which was packed when only the animal heat was out of it.

GREAT LAYERS.

New Breeds of Belgian Hens and Their Characteristics.

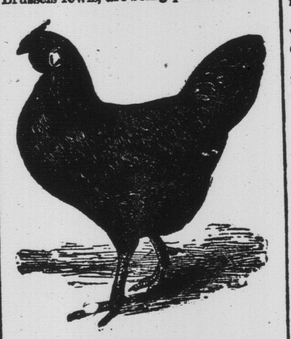
One of the new Belgian breeds of poultry, says the American consul in Antwerp, is the Herve chicken, which is black and has a moderate single, straight comb, reddish brown eyes, red gills and ear lobes, small roundish wattles, stocky neck and abundant flesh. The breast is rather strongly developed, and the vertical tail is quite well feathered. The legs, of a very dark bluish or blackish color, are not long. This fowl is healthy, active and rivals the best layers. It is originally from the district of Herve—hence its name—in the province of Liege, where it has long been known to farmers. It has, however, been much neglected and bastardized with breeds of lesser value.

The Manheid is similar to the Herve. It has the same characteristics and differs only in its plumage and its height, both of which are less developed. In color it is blue black or light ash blue. Its comb is single, straight, not too large and slightly notched. Its eyes are reddish brown, its ear lobes bright red, and its wattles are not highly developed. The shading of the neck is darker than the remainder of its plumage; the breast is rather wide, the tail slightly developed, the legs bluish gray and mostly covered. It is a good layer. The Herve and the Manheid weigh about 4½ pounds each.



BLACK HERVE HEN.

Within a few miles of Brussels the breeding of the Coocoo of Malines is becoming daily more and more important. Fattened specimens of this race, called Brussels fowls, are being perfected marvelously. The breeding and fattening of these fowls give employment to hundreds of peasants. There are specialists who thus prepare as many as 1,000 to 1,500 chickens every three weeks. The sale price varies from 58 cents to $1.35 apiece, according to the season. The Coocoo of Malines sits summer and winter, and as a result of great care by skilled breeders a sufficient number is raised for the demands of the annually increasing trade. In the vicinity of Merchtem there is found a variety of Coocoo of Malines known as the Coocoo of Merchtem, which is gradually surpassing the other varieties in weight and delicacy of meat.



MANHEID HEN.

Under the direction of the Belgian minister of agriculture lectures on poultry raising are given to every group of aviculturists who express a desire for them. Under the influence of this instruction it is now remarked that the coops are much better kept than formerly; that much greater care is given to the nests, and that the food is much better prepared. Thus corn, formerly almost exclusively used as food at all seasons, is being replaced by a more varied diet, according to the time of year and its products—cooked potatoes mixed with grain and milk served tepid in winter, buckwheat, barley, wheat, oats and occasionally in summer hemp seed. The use of crushed oyster shells is scarcely known.

MALINES CHICKEN.

Soft Eggs.

The laying of soft eggs—that is, eggs covered with a membrane rather than a shell—is easily ascribed to overfatness, but some hens persist in the habit, whether fat or lean, even if well supplied with lime, and such fowls are doubtless affected with chronic disorder of the organs of reproduction. While these are all right for table poultry, they are good for nothing else. If several hens in a flock lay soft eggs, it is a sure sign of overfeeding.—Live Stock.

DAIRY & CREAMERY.

PRIVATE BUTTER MAKING.

Is It Waning Before the Competition of the Creamery?

As a rule the private butter maker is losing caste and losing his standing in the markets, says The Creamery Journal. The exceptional dairyman never had a better show in competing with the creamery, but the great mass of them are coming up against the stone wall of fate. But a few years ago the private dairyman had practically the home market at his control. Now the creameries are taking this and to the better satisfaction of consumers. The farmer with a few cows is seeing that it is not practicable to churn for family use and sell to a few friends. They are all shifting over, cow owner and all, to using creamery butter. In the best dairy portions of the state creamery butter is on the farmers' tables, on the farmers' friends' tables in town, in the mansion and in the cottage.

To sell at top prices in the general markets all the farmer had to do a few years ago was to put good butter up in creamery tubs. More is necessary now. He must make enough to have a fairly large and a regular supply and of a uniform grade. Otherwise it will sell about 2 cents less than practically the same grade in creamery butter. There are still many retail dealers who will pass by creamery butter and take dairy butter in standard packages if it is of about the same quality and will sell unchallenged to most of their patrons who ask for creamery butter—that is, these retailers will take the dairy butter instead of creamery butter if the price is 2 cents less—otherwise they will take regular creamery in regular lines and save the strain on their conscience occasioned by dishing out creamery butter from a standard tub filled on the farm. As we noted above, the large dairyman can provide machinery and laugh at creameries, but the others find it anything but mirth provoking to be discounted 2 cents a pound in the large markets and be frozen out in their markets.

Ropy Milk.

In the Pennsylvania Bulletin Secretary Thomas J. Edge names the following as among the peculiarities of ropy milk:

That the trouble is often not apparent when the milk is first drawn from the cow.

That, after standing a short time, the ropiness commences to develop and increases rapidly in extent and viscidity.

That in many cases it is scarcely to be detected in the milk, but is shown to an unusual extent in the cream.

That it is more likely to show itself during hot weather following an unusually dry time.

That it is more prevalent during that portion of the season when the difference of temperature between day and night is most marked, or when we have a succession of hot days followed by cool nights.

That it is most prevalent when the animals are not provided with the proper shade or other shelter from the hot sun.

That it is most commonly absent or least prevalent during cool and moist summers and autumns.

That animals having plenty of running water, shade and regular supply of salt are rarely affected.

That the theory that small doses of saltpeter administered every other day will cure or prevent the evil has no foundation in fact.

That all of the surroundings of the disease lead to the conclusion that, whether caused by fungoid growth or not, it is in fact a species of partial decomposition.

That it is due to a disease in the system of the animal, and that to be effective all cures must begin there, and that external remedies, while they may possibly mitigate the trouble, are not to be depended upon.

That a careful examination of each cow's milk will usually show that the whole mixed milking is infected by the milk of a single cow, and that the evil is not as widespread as some are inclined to suppose. That the fact that, without any changes in the local surroundings, it will disappear as rapidly as it came warrants the conclusion that it is due to some temporary derangement of some of the animal secretions.

Cheaper Production of Butter.

The cost of butter, and indeed of all dairy products, is dependent mainly on the character of the herd. The same feed given to the best cows will make twice as much milk and butter as it will with ordinary scrub animals. The farmer cannot make the price of butter higher. But he owes it to himself and family to get the very best cows that he can buy, so as to make the cost of producing butter less. Of course these better cows must be better cared for and better fed than are the cows he has been used to keeping. But when a farmer makes the right beginning by purchasing the best cows all the other requisites for successful dairying will follow naturally in their course.—Boston Cultivator.

Parsnips For Cows.

There is no better root for cows than the parsnip, says the Boston Cultivator. It has the advantage that part of the crop may if need be be wintered in the ground where it has grown. The parsnip, unlike the beet, makes a rich milk. It is equal to the carrot in this respect, and undoubtedly, like that root, helps to color winter made butter. Parsnips are a favorite winter feed of Jersey and Guernsey farmers, who by its use have been able to breed cows whose high butter color has become hereditary in these breeds. No doubt the parsnip feeding is in part responsible for the color of Jersey butter.

THE NATURAL SIZE.

A Veteran Poultryman's Protest Against Forcing For Large Birds.

In the Dec. 15 number of Farm Poultry you have an article on "The Natural Size," which contains as much good gospel for practical poultrymen as I have ever seen in like space.

There is no doubt that there is a continuous call for White Wyandottes of extra size and weight. It mostly comes, in my experience, from young fanciers and those who keep only a few hens and who know little about poultry in the sense of profit makers in a practical market way.

The demand is fostered most largely by a class of judges in our poultry shows who sacrifice the standard weight bird in favor for one of heavier weight and larger frame. It seems to me that where the standard calls for 7½ pounds for a cockerel, one weighing 8½ or 9 pounds would be as far off as one weighing only 7 pounds, but the larger bird invariably gets the ribbon, without there is some defect so glaring it cannot be passed.

There can be no question that the medium sized Wyandotte is the true type of business bird. They will lay more eggs, a larger percentage of the eggs will hatch and more chickens can be raised to maturity. We believe this to be true of all breeds—when we begin to force the size we begin to weaken the vitality and lower the egg yield and power of reproduction. If this is true, it would seem reason enough why they should be bred to not overstandard size, if not a little under. When to this we add the fact that it injures the breed as a market fowl, there is still greater reason why the size should be kept where it is.

As you have so many times said and as every man who has ever made a business of handling dressed poultry knows without telling, the demand is not for the large, oversized carcass, but for a medium sized fowl or chicken, plump and meaty and not overfat. Hens weighing 4 to 5 pounds each and chickens from 7½ to 9 and not over 10 pounds per pair are the quick selling sizes and most in demand for fine family trade. This being the fact, and it can easily be proved, where is the sense in pushing to heavier weights and lankier frames a breed, or variety of a breed, which is acknowledged to be the most practical market bird now in existence? There is a certain class of new men in the business whose first ambition, as soon as they can tell one breed from another, is to originate something new or else to monkey with some of the already established breeds, and always to the detriment of the breed. The White Wyandottes stand today as the best all round up to date business birds living. They are gaining ground in every section of the country and are bound to lead wherever choice poultry and a plentiful supply of eggs are the considerations for which fowls are kept. But if the practical man must necessarily sacrifice color of leg and skin to get good show specimens it is to be hoped that in the future he shall not have to also sacrifice the other important market features in order to satisfy the eye of the judge, who is apt to know much of the Greek and Sanskrit of the business, while he is sadly shaky on the everyday alphabet.—George H. Pollard in Farm Poultry.

Poultry Notes.

The only way to succeed with poultry is by giving fowls attention, proper food and a good warm house, and keeping young stock, either pure bred or grade.

Potatoes, onions, carrots, beets, turnips and cabbage make good winter food for hens. Cinders from burned bone as well as raw bone are good for the poultry. Send all refuse table scraps to the chicks. They like a variety of food.

Every farmer's family should have a good flock of hens. There are possibilities for a good education for the son or daughter with the product of a full sized, well cared for flock of poultry.

Give the layers a little cayenne pepper in a warm mash made of vegetables, wheat bran and meal two or three times a week. A bone cutter will soon pay for itself. Give the biddies bone meal twice a week and watch the returns in the egg basket.

Keep geese, ducks and turkeys in different compartments from the hens.

A small flock, with plenty of room and well cared for, will yield larger returns than a large flock left to shift for itself or crowded into small quarters. Keep only the best of the flock for breeding purposes. Aim to improve, not to retrograde.

There is no secret in getting plenty of eggs in winter. Good, young stock, good, warm quarters, a variety of good food and plenty of exercise, with fresh warm water to drink and cleanliness to insure good health in the flocks, are all there is about it.

Why Fresh Bones Make Eggs.

The different parts of ordinary market bones upon analysis were found to contain in abundance the ingredients which go to make up the growing chick and in wonderfully close proportion the different parts of the complete egg. The lean meat and gristle form the white of the egg and about 16 per cent of the yolk. The marrow and other fat on the bones supply the remainder of the yolk. The lime phosphates in the bone yield all the necessary lime salts for the shell and the requisite phosphates for the interior of the egg.—A. C. Pickering in Farm and Home.

Langshan Club.

Langshan breeders in the state of Illinois not members of the American Langshan club are requested to send their names and addresses and they will receive by mail a pamphlet giving the rules of the club, a list of members and its objects and advantages. Address the vice president for Illinois, W. W. Hoglo, Evanston, Ills.