

SOY BEANS—THEIR CULTURE AND USES

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A Successful Field of Soy Beans.

"My clover failed on account of dry weather," or "My clover froze out." "Now what shall I do or what can I sow to make up for the clover failure?" This is a question that has been put to the soils and crops department many times. Until within the last ten or fifteen years this question was hard to answer, but the department now knows the value of some of the annual legumes as substitutes for clover. One of the most important among these is the soy bean.

The soy bean, being a legume that matures in one year, is subject, more or less, to the same conditions and the same treatment as any of the other annual plants. Being subject to frost and freezing, it becomes necessary to delay the planting until all danger of frost has passed by. As a general rule, it is safe to plant soy beans immediately after the corn has been planted or from the fifteenth of May on. For seed production, the soy bean should be planted not later than the tenth of June and, if then, only the earlier maturing varieties should be used. The earlier maturing variety used, the smaller will be the yield of seed.

There are three methods of planting soy beans: drilling in rows, drilling solid, and sowing broadcast. The seed may be sown in rows, not over thirty-six inches apart for largest seed yields with a corn planter, setting the drill attachment to drop, on the average, one seed every two inches, or with a grain drill set to sow one and one-half to two bushels of oats per acre. The seed should not be covered deeper than one or one and a half inches. A heavy rain may pack the ground so firmly that the plants cannot push their way through, when covered deeper. Broadcasting is the least desirable method of sowing soy beans of any, because of the poor germination that may occur due to insufficient covering and moisture and the consequent large percentage of weeds that grow up. The average of several years' experimentation at this station shows that, when sown in rows, a slightly larger yield of seed and hay has been secured from the rows sown from twenty-four to twenty-eight inches apart than from rows over thirty-two inches wide. Drilling solid with a wheat drill at the rate of 60 pounds of seed per acre produced a bushel of seed and nearly seven hundred pounds of hay per acre more than sowing in rows twenty-four to

twenty-eight inches apart. Drilling solid also produced 8½ bushels of seed and 1,300 pounds of hay more than the broadcasting method produced, and greatly lessened the percentage of weeds. Weeds are quite troublesome, even where the seed is drilled solid, when the season is wet, but on the average the best yields of both grain and hay can be obtained by drilling solid so far as experiments at this station indicate. If the ground is foul it probably would be best to sow in rows.

The soy bean crop, of course, can be cultivated only when it is growing in rows, and up until harvest time it may be handled as one would cultivate corn. A corn cultivator with adjustable wheels can be used on rows not less than twenty-eight or thirty inches wide.

Soy beans, as well as the cow peas, are adapted for use in the rotation when clover fails. Instead of sowing the field due for a legume to a grain crop, either soy beans or cow peas may be sown in the spring, and the crop cut in the late summer either for seed or hay. An average yield of seed is fifteen to twenty bushels. Many farmers are able to produce from twenty-five to thirty-five bushels of seed per acre. It is also possible to obtain from three to four tons of soy bean hay, while a yield of less than two tons would be considered unsatisfactory. Soy beans are excellent feed for hogs in the early fall when balanced up with corn. Young animals make good gains and a large amount of vegetable material is trapped into the soil.

Soy beans make a good growth when sown after the wheat crop is harvested, provided there is sufficient moisture to keep the plants growing. Under favorable conditions ten tons, on the average, of wilted green material can be produced. If an early variety of seed is used, and the season is unusually long, a fair crop of seed can be harvested by sowing after wheat harvest. The chief purpose of an after harvest crop of soy beans is for plowing under.

Soy bean oil is coming into prominence for a variety of purposes, such as soap making and as a partial substitute for linseed oil in paints, and it is safe to predict that the manufacture of this product will be one of the new industries of this country which will be a source of considerable profit and at the same time build up a profitable market for soy beans for the farmer.

LIMING OF THE SOIL

By JOHN B. ABBOTT, Department of Soils and Crops, Purdue University Experiment Station.
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The kind of lime to use and the amount are matters of distinctly secondary importance. Essentially the same effect will be produced by 100 pounds of marl, ground shells, ground limestone or air slacked lime as by 75 pounds of hydrated lime or 56 pounds of fresh burned lime, and it makes very little difference which is used. Choice should be based mainly on relative cost and purity, but may be influenced to a certain extent by the facts that burned lime and hydrated lime are more disagreeable to handle than the other forms and probably somewhat more exhaustive of the organic matter in the soil.

The question of real importance is whether to use lime at all or not. The answer depends absolutely upon the chemical reaction of the soil. If the soil is basic or alkaline in reaction lime need not be used, but if the soil is acid lime is needed badly.

Acids and bases are exact opposites chemically, and when brought together as they are in the soil they combine and form chemically neutral, and generally harmless, compounds. This chemical combination goes on until all of the acid or all of the base is used up. Of course it is only seldom that the amounts of acid and base are just equal, so after the reaction is complete there is some of one or the other left over. Whichever one is thus left uncombined governs the character of the soil. If acid compounds are left over the soil is said to be "sour" or acid in reaction.

Investigation and experience have shown that the acid condition is very unfavorable to crop production. This is particularly true of clover and alfalfa, which fall to develop root nodules in acid soils, and in consequence soon sicken and die. In the case of rich soils these crops may survive in spite of acidity, but in such cases they draw their nitrogen from the soil just as other crops do instead of taking a large part of it from the air, as they are capable of doing under more favorable conditions.

Maintenance of a supply of nitrogen in the soil for the grain crops is dependent upon fixation of atmospheric nitrogen by legumes, so the failure of legumes to fix nitrogen is a serious matter. It means soil exhaustion.

To correct this very unfavorable condition the reaction of the soil must be changed from acid to alkaline, and lime is the basic or alkaline material to use for that purpose. No other treatment whatever is practicable. The laws of chemistry are just as immutable as the law of gravity. Acid soils contain an excess of acid compounds, and can be rendered alkaline only by adding basic or alkaline material enough to combine with all the acid compounds and have some left over. It makes little difference whether the amount left over be large or small—within reasonable limits—hence it makes little difference whether the application of lime be two tons to the acre or four, except that the smaller the application the sooner it will have to be repeated.

Consistent success with clover or alfalfa is proof that the soil does not need lime. Persistent failure of these crops is a good indication that it does. A simple confirmatory test may be made with blue litmus paper, which can be purchased at any drug store. Break open a moist clod, insert a strip of the blue litmus paper, press the soil firmly together again, and leave for ten to fifteen minutes. Pronounced reddening indicates acidity.

LAYING OUT A GARDEN

ERRONEOUS IDEA THAT MUCH TIME IS REQUIRED.

Plot 150 by 100 Feet Will Produce Enough Fruit and Vegetables for Family of Six—Run the Rows North and South.

(By E. PARKER.)

There is an important economical side to this question of a garden. Reef, for instance, in its various forms is notoriously expensive, especially where it is eaten twice or three times a day, whereas beans, peas, spinach, etc., when served with meat would make up half the amount eaten, thus reducing the cash cost of the whole. And the impression that a vegetable garden requires much time and care is such an erroneous one! Two or three hours a week will suffice for a garden 150 by 100 feet, which is capable of producing fruit and vegetables enough for a family of six, provided the rows are three feet apart so that a horse may be used.

In laying out such a garden the rows should be run north and south, for planted thus vegetables receive the greatest amount of sun. The first four rows should be six feet apart, and the first of these might contain twelve currant and twelve gooseberry bushes set six feet apart. In the second row plant a hundred raspberry canes three feet apart, with two canes at each place. The third row will be for strawberries and will hold 150 plants grown in hills set one foot apart, no runners being allowed to grow. The next thirteen rows will be three feet apart and may be planted to the following vegetables in the order given: Asparagus plants, 50 one-year seedlings, set three feet apart in the row; parsnips, 50 feet; then a hundred feet of onions, of which 25 feet may be young sets for early summer; beets and lettuce, 50 feet; early cabbage, a hundred feet; late cabbage, a hundred feet; cauliflower, 50 feet; peas, three full rows, corn, four full rows; tomatoes, a hundred feet; beans, 50 feet; okra, ten feet; then 50 feet more of string beans and 150 feet of dwarf lima beans. The remaining four rows should be eight feet apart to allow the vines to spread. In the first row plant 25 muskmelons six feet apart, then a row of cucumbers set six feet apart, five eggplants and ten early squash, all six feet apart. The next row may be planted to eight Hubbard squash and twelve rhubarb plants, set six feet apart, and the last two rows may very properly be given over to herbs and flowers for cutting.

It is frequently forgotten that a great many people abroad, notably the drawers of water and hevers of wood, live almost entirely on vegetables, considering meat a luxury only to be indulged in once a week, while we in America, having the most delicious and greatest variety of vegetables grown anywhere, discard them for meat.

RAISING BEST DAIRY BREEDS

No More Profitable Line of Stock Growing Than Raising Good Cows for the Dairyman.

Any farmer is safe in breeding and raising for sale large milking or butter-producing cows. As an industry there is no more profitable line of stock growing than raising good cows and selling them to the dairymen who are making a specialty of producing market milk or selling their milk to



A Good Milk Producer.

condensing plants where they do not have the by-product returned to their farms to feed out to the calves that are being raised to replace the cows that are annually discarded from their herds.

The keeping of more cows for creameries and cheese factories is also encouraging and many men are willing to pay a good price for well-bred dairy cows.

SUNLIGHT AS DISINFECTANT

Most Disease Germs Are Killed by Direct Light, as Repeated Tests Have Demonstrated.

(By H. PRESTON HOSKINS.)

Sunlight is one of the best and cheapest disinfectants at our disposal, and we should take advantage of this fact at every opportunity. In the construction of barns or shelters of any kind for animals, ample provision should be made for the admission of the maximum amount of sunlight. Southern exposure is desirable, that is, having the majority of the windows facing the south. The warmth thus provided in cold weather is desirable, and much of the excessive heat in summer can be avoided by providing suitable curtains or screens. Most disease germs are easily killed by direct sunlight, as has been repeatedly shown by experiments.

NOTES OF THE POULTRY YARD

Whitewash Improves Looks of House and is Good Disinfectant—Give Turkeys Free Range.

(By MRS. A. J. WILDER.)

Lime is a very good thing to use about the poultry houses. An occasional coat of white-wash on walls and on the nest boxes greatly improves the looks of the house, besides being a good disinfectant and vermin killer.

Pullets hatched in April or the first of May, make late fall and winter layers, and they are the ones that pay. Hatch all you can of them.

If a sitting hen leaves the nest, do not throw away the eggs unless they are cold. If you have another broody hen, put her on the nest. She will finish the hatching, and it will save her just so much time, as well as saving the eggs.

Give the little chicks skim milk to drink. It is very good for them, as well as for the older fowls. The more milk your poultry drink, the less meat it will be necessary to feed them.

Do not keep too many hens in one flock. Much better results are obtained from the smaller flocks, and it is the results that count.

If you want the pullets to mature early, and begin laying at five or six months old, feed them properly and well from the start. Give them a properly balanced ration, and crowd



A Nice Sunny Yard for the Chickens is Necessary.

them as fast as you can. There is no need having to feed pullets from eight to ten months, before getting any returns.

Hasten the growth of young cockerels, by feeding them all they will eat. Keep them fat enough for the table all the time, and they will reach the required weight for the market much sooner. It is the earlier markets that pay the best prices.

Don't make the mistake of thinking you can half feed your hens and make a success of the poultry business. The wants of the hen's body comes first. If there is any surplus it goes into the eggs. Where there is no surplus there are no eggs. It is your business to provide enough food for the body and the eggs.

If you are keeping hens for egg-production only there is no need for keeping any males. It costs about \$1 to feed each one, and their room might better be given to that many more hens.

Turkeys must have free range in order to do well. Do not keep them closely confined. If you have fed them regularly, they will continue to come up at that time for their feed, even if allowed to run free.

PRODUCTION OF GOOD EGGS

Wisconsin Expert Emphasizes Importance of Clean, Whole Food—Keep Nests Clean.

Just because an egg is freshly laid by an apparently healthy hen it can not be assumed that it is a good egg, according to James G. Halpin of the College of Agriculture of the University of Wisconsin, who emphasizes the need of clean, wholesome food for the production of first-class eggs. Hens that are forced to obtain the greater portion of their living as scavengers and given a poor range to work on cannot produce eggs of as good quality as can a flock which regularly is fed a good ration.

Eggs lacking in protein have a watery white and the shell is apt to be thin owing to the partial absence of lime. Such eggs, besides being of less value as food, are more than likely to bring forth young chickens of low vitality, subject to white diarrhea and an early death. With proper quantities of wheat, bran, clover, oyster shell and sound grains in the ration fed to laying hens, eggs with firm shells, rich in protein and delicately flavored are sure to result, providing of course, that the flock is given clean nests and runs and is kept free from mites.

No Use for Cholera.

If it were not for hog cholera pork raisers would be living in the lap of luxury. The time will come when there will be no more excuse for hog cholera than for human cholera that until a century or so ago periodically devastated Europe and America. Both are essentially filth diseases.

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As One Who's Been Humbled.
The head of the family drank his coffee uncomplainingly, although its strength brought tears to his eyes. "Why, father," remonstrated his son, "how could you swallow that lye?" "My son," replied the old gentleman, "it's not the first lye that I have had to swallow, by any means."

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