

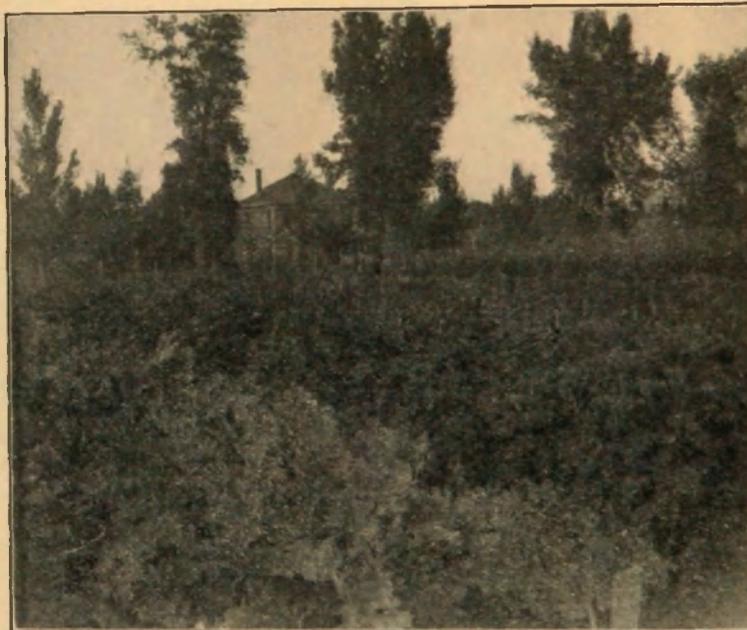
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GARDEN NOTES, 1910

By E. R. BENNETT

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GARDEN NOTES, 1910

By E. R. BENNETT

The garden proposition in Colorado, differs materially from that in the East. It is always a question in a new country as to what will succeed, and what fail. Many people have thought that because of the high altitude of Colorado, few of the garden crops that succeed in the East could be grown here. In fact this idea has been so prevalent that for years many of the ranchmen in the higher altitudes of the State, have lived on canned goods and have freighted potatoes from distant points at four cents per pound, when vegetables, (potatoes in particular), could have been grown better on their ranches than in most places in the East, or even in the lower altitudes of Colorado. Different places in Colorado differ so materially in altitude, and therefore in temperature and rainfall, that it is impossible for anyone to give definite directions, or make definite statements as to what may be done in the State as a whole. Even when certain truck crops have been failures in many places, we cannot conclude that the crop may not grow satisfactorily in a given place until we have tried all the methods possible for its culture. In other words, because a given crop will not grow as handled in Iowa or Ohio, it does not necessarily follow that it cannot be grown, even more successfully, here than there, when we know how to adapt the culture of the plant to our conditions. Many strange discoveries have been made in the State along these lines. For instance, it has been found that cauliflower, cabbage and potatoes may reach the acme of productiveness and quality in places where it was thought almost no crops of these kinds could be grown. Because of these peculiar conditions, it has been thought best, particularly for the benefit of new comers in the State, to discuss the possibilities of growing the various garden crops and the methods which we believe to be best adapted to our conditions. It must be remembered that the work done along these lines, at this Station, cannot be taken as a guide, other than in a general way for similar work in other parts of the State. Almost no two places have the same conditions, and methods employed must be changed accordingly.

During the season of 1910, as many as possible of the annual truck crops adapted to Colorado conditions, have been grown in the gardens of the State Agricultural Experiment Station.

In the work of truck gardening, that has been taken up at the Experiment Station, two ideas are being kept in mind. First the truck crop from a commercial standpoint is considered. This includes all the crops such as cabbage, cauliflower, celery and the like, that are grown for local markets, and also for shipping to

distant markets. These crops are adapted to certain districts and from a commercial standpoint are not adapted to all districts. On the other hand, the truck crops for the home garden may be grown in practically all parts of the State, even though certain ones are not sufficiently adapted to the conditions to produce a maximum of yield and quality. For this reason, we will take up the various vegetables that are in any way adapted to our climate in the alphabetical order, as a matter of convenience, rather than in the order of their importance.

Asparagus.—*Asparagus*, is one of the most satisfactory crops for the gardens of Colorado. There are comparatively few troubles or pests that interfere with growing this crop in the home garden. In fact, the vegetable easily becomes a weed and may be found growing wild along the creeks and ditches in nearly all parts of the State. There is no reason why every garden should not have a sufficient supply for family use. Whether this vegetable may be grown for a canning proposition, we are not prepared to say. An experiment is now under way to demonstrate this point.

April 12, 1910, about one-tenth of an acre in the College garden was sown to three of the leading varieties of asparagus, i. e. Conovers Colossal, Palmetto, and Barr's Mammoth. *Asparagus* is slow in germinating. Five weeks elapsed before this seed germinated sufficiently to be seen. It has been thought that asparagus would not do well in this climate. This, however, has made a perfect stand and has grown as well as could be expected at any place. In fact, some of these plants have attained a height of more than two feet. At present, the one year roots are being dug for storage and planting next spring. The yield will not be less than 15,000 plants, or at the rate of 150,000 plants per acre. The culture of asparagus for the garden is very simple. It is only necessary to have the soil thoroughly prepared by deep plowing, and well fertilized by mixing with the soil not fewer than twenty to thirty loads of decomposed stable manure per acre. If the asparagus is to be planted in a small plot in the garden, the plants may be set in early spring in the ground in a trench, with the plants from one foot to eighteen inches apart. The plants should be set in a trench at least six inches deep, and covered with not more than two inches of soil at the time of setting. The roots should be spread out in the bottom of the trench with the crowns up. During the season, the trenches may be gradually filled so as to level the ground. When frost kills the tops in the fall they should be cut, and when sufficiently dry should be burned. This will help destroy the insects and fungus pests that trouble the plants. After the plot is cleared, it should be covered with a good coat of stable manure, which should be harrowed into the soil the following spring.

Beets.—All the different varieties of beets, including table beets, mangel wurzels, and sugar beets do well in Colorado. The table beets are easily grown. For early growing they should be planted as early in the spring as the soil can be worked. In high altitudes these are good for table use even into the winter. For the lower altitudes second plantings should be made in June, as those planted early in the season tend to overgrow and become pithy. No particular pests trouble the beets to any extent. The beets in the College garden were ready for market during the months of June and July.

Brussels Sprouts.—One of the vegetables that is almost unknown in the State, but is particularly adapted to the climate of Colorado is the Brussels Sprout. This vegetable is to all intents and purposes a cabbage and may be grown in the same manner as the cabbage. This plant instead of forming a single terminal bud or head forms small heads in the axil of the leaves. For success with this vegetable, it is best to grow it from seeds in hot beds or cold frames, and transplant to the open ground as soon as the weather will permit. The culture is the same as for the cabbage, and insect pests that work on cabbage also work on this plant the same as on cabbage, except that the Green Aphis is more prone to attack the sprout than cabbage. For treatment see cabbage.

Beans.—Theoretically, the bean family should be well adapted to the dry climate of Colorado. It has been found at least in Northern Colorado that the bean has more serious insect enemies than in most other parts of the country. Ordinarily the crop can be grown satisfactorily when the depredations of the striped flea beetle, and lady beetle can be controlled. Care must be taken in the culture of beans not to give more water than is necessary for the development of the plants.

Cabbage.—The cabbage is well adapted to Colorado conditions, particularly the higher altitudes. Growing this crop is becoming one of the commercial industries of the Greeley, Fort Collins, and Denver districts. Owing to the bulkiness of the crop, it has not been grown to any great extent in the mountain valleys of the State, although it is as well or better adapted to those conditions as on the warmer lands of the plains. Early cabbage should be started in cold frames or hot beds, and may be transplanted to the field or garden as soon as the soil can be worked in the spring, provided the plants have been sufficiently hardened off by exposure to the cold. In the College gardens, the Winningstadt variety of cabbage was set May 9th. These cabbage were ready for market the middle of July. Practically every plant made a firm head that weighed from two to four pounds. Cabbage for late use should be set in the field from the latter part of May until the first of July,

depending on the length of season of the place. At Fort Collins Cross cabbage set from the 25th of May until the 5th of July make a crop that is usually matured at the end of the growing season. For market cabbage, it is best to set plants sufficiently close to keep the size of the heads down to five pounds. At Greeley, where 50,000 pounds per acre have been grown, these cabbages are set in rows from 24 to 28 inches apart, and about 14 inches apart in the row; thus using 12,000 to 14,000 plants per acre. Cabbage require a maximum of fertility, particularly of nitrogen.

Two serious cabbage insects are found in Colorado. The most serious one is the so-called cabbage worm, the larva of a white butterfly. In reality there are two species of these worms. Their habits are so nearly alike, however, that they may be treated as one. The best remedy for these worms is to dust on the plants a light application of Paris Green or some of the other arsenical mixtures diluted with flour or lime. If this work is done before the plants are too large, there will be no danger from poisoning either human beings or stock. The green aphid is also frequently destructive to the cabbages. These are best controlled by spraying the plants when the aphid first attacks them, with some contact poison as tobacco decoction or kerosene emulsion. Ordinarily these aphids do not cause sufficient injury to warrant any treatment.

Cauliflower.—Cauliflower is one of the crops that is especially adapted to Colorado conditions, and should be in every garden, even if not for commercial purposes. Cauliflower matures even at an altitude of 8,500 feet. For the past three years this crop has been experimented with in a small way at the Agricultural College and in various parts of the State. This vegetable is peculiar in its demands of soil, climate, etc. In the East, where it is grown for market purposes, it is thought to be doing well if one-half the plants make heads that weigh from one to two pounds. In the high altitudes of Colorado, as in the San Luis Valley, Middle Park, and Aspen, it is not uncommon to find heads that measure 12 to 14 inches in diameter and weigh six to eight pounds. We believe this vegetable in a short time will be grown, not only for home use, but for shipping East to the big markets of the United States. The only difficulty in growing cauliflower in mountain districts is that where gardens or fields are near uncultivated areas, the prairie dogs, ground squirrels, and other small animals are apt to find the vegetables toothsome and are not willing to wait until the crop is ready for harvest.

During the season of 1910, plants were grown at the Experiment Station for experiments in different parts of the State. About 1,000 of these plants were sent to Del Norte. About the same to Grand county, and an equal number was set in the fields

of Fort Collins. Owing to accidents, neither of the lots sent out proved as satisfactory as was hoped. Better than 90% of those that were planted at Fort Collins made marketable heads. Two varieties, Early Snow Ball, and Extra Early Dwarf Erfurt, were used. The late planting was set June 15th and 16th. Up to the present, from one-tenth of an acre of cauliflower 785 pounds have been sold, bringing \$42.30. A part of the crop is being held in storage to determine the advisability of keeping cauliflower after the season closes. Cauliflower demands cool weather and a soil that is fairly strong in nitrogen and also well supplied with phosphorus and potassium. The culture for this vegetable is the same as for cabbage, with the additional work of going through the field every day or two after the heads begin to form and tying the leaves together to prevent the small white heads from coloring. If this is neglected until the head is colored by the sun, the vegetable is injured both for market and family purposes.

Corn.—Corn is a crop that is not well adapted to Colorado, except in the lower altitudes. Corn, requires warm days and nights to make its best development. While it is not advised to grow corn for market purposes, it may be grown in the home garden satisfactorily, except in the higher altitudes. The culture is the same as in other districts. It is well to give corn as little water as possible, as over watering serves to retard the maturity of the corn. The worst enemy of the corn is the so-called boll weevil, or corn worm, which feeds on the immature grain in the husks. No remedy is known for this insect. A succession may be maintained from the latter part of July until frost, by planting such varieties as Corey, or Catawba, for early, Crosby's 12 Row, second crop, and Country Gentleman, for late. At Fort Collins, these three varieties did very well during the past season. Stowell's Evergreen and like varieties are too late to be satisfactory with our length of season.

Celery.—Celery is one of the crops that is not only being grown for home use, but is being extensively grown in Colorado for market. Until within a comparatively short time, it was thought that celery could not be grown in the so-called arid West. It has been found, however, that celery not only can be grown in the West, but that the texture and flavor of Colorado celery is much superior to that grown in either Michigan or California. The celery crop this year in the so-called Denver district will probably amount to 400 cars. This does not include that grown in the Pueblo district, or for numerous markets in other parts of the State. There is no reason why celery should not be grown in every garden. Considerable complaint has been made by celery growers that the tendency of the plant to make seed stalks the first year is a serious

menace to the industry in the State. As a working hypothesis we have assumed that this trouble is due to some of the changes which the plant has undergone in being brought from a humid to a dry climate. In order to investigate this, a small area of both early and late celery was set in the College gardens at Fort Collins. The plants for this experiment were sown in flats in the green house, then pricked from the flats as soon as large enough into benches, $1\frac{1}{2}$ to 2 inches apart each way. This gave sound, stocky plants for setting in the field. Great care was taken from the time the seed was sown that these plants did not suffer for water. Plants were set in the field May 27th and 28th. This date is rather early for Giant Pascall, which is intended for late crop, but was set early in order to induce the plants to go to seed if there was any tendency in that direction. The Golden Self Blanching, was set on either side of a ditch, making two rows about 12 inches apart. Plants were set 8 inches apart in rows. The Giant Pascall was set in single rows six feet apart, eight inches apart in the row. These plots were given clean cultivation at intervals of about one week, with a twelve tooth Planet Junior cultivator. The soil in these plots was kept thoroughly moist. In order to do this, irrigation was given at intervals of from three to five days during the whole summer. This kept the soil more moist than would be desirable for most plants. The Golden Self Blanching was bleached by tying up the plants individually with old news papers. This method of bleaching proved satisfactory, except where the papers were tied so tightly that the new shoots in the center of the plant were prevented from making their way to the top. In these cases the new shoots doubled up and in crowding started decay. No plants of this variety showed any signs of sending up seed stalks. Nearly all of this was marketed during August. The Giant Pascall was left to grow until rather late in the season. In September furrows were turned to the rows and left for two or three weeks, then early in October the larger part of the plot was taken up and set in a trench for bleaching. This trench was prepared by throwing out a double furrow with a plow and then shoveling out the loose soil so the trench was made about 18 inches deep, and two feet wide. In this the celery was trenched, three plants wide and as close together lengthwise in the trench as the roots of the plant would permit. After setting in the trench water was allowed to run through the trench to firm the soil around the roots. The trench was then covered with corn stalks, and later with straw, old tomato vines and earth. A part of the plot was left where grown. These plants were banked sufficiently high to bleach, then as cold weather approached were covered with tomato vines, straw, etc. A few plants were also taken from the soil and placed in half barrels in the

cellar. This system may be utilized where only a few plants are used, and cool cellar room is available. Although the Giant Pascal made large plants because of having a longer season for growth than is usually desirable for the crop, there were but four or five plants in the whole plot that showed any tendency to go to seed. This would indicate that the cause of celery going to seed prematurely in Colorado is because of drying out of the soil sometime during the growing season. Celery in its natural condition grows in swamps, in other words it is a semi-aquatic plant. It is also a biennial, that is, it should make growth in one season, and develop seed the next the same as the carrot, parsnip, etc. The theory is that, in Colorado, the growth of the plants becomes checked by lack of water sometime during the summer season. This corresponds to the resting season over winter in its natural habitat. When growth starts again after the check the plant sends up its seed stalk. This experiment has not been carried far enough to demonstrate this theory beyond a doubt, but we believe that at least a large part of the trouble experienced by Colorado growers comes from this cause.

Celery growers in Colorado are troubled very little with fungus diseases or insect pests. Occasionally we hear of trouble from decay of the stem. This is undoubtedly caused by fungi. This has not been serious enough up to the present time, however, to lead to any particular investigation of the subject. Celery rust occasionally occurs, but this is not ordinarily serious. Few insects give any trouble.

Cucumber.—The cucumber is a semi-tropical vegetable, and is not supposed to be very well adapted to Colorado conditions. For all places, except the very high altitude, however, this vegetable may be grown with perfect success. While the cool nights are not particularly favorable to the growth of the cucumber, the absence of diseases that cause trouble in other places offset this difficulty to such an extent that the yields are on the whole practically as good as in the so-called cucumber districts of the East. The cucumber needs considerable moisture, and yet care should be taken not to cause a cooling of the soil from too frequent or heavy irrigation. In order to avoid this while the plants are small, the harrow should follow as quickly as possible after irrigation. Where the season is short, the seed should be planted early. The early varieties are to be recommended rather than the larger growing late varieties. The greatest danger to the crop is from poor germination of the seed, owing to the cool nights in the spring. It is well to plant plenty of seed and depend on thinning the plants down to the required number. In the Experiment Station plots, both Coy's Cumberland, and the Fort Hook Famous cucumbers made

good growth until the heavy frost of August 24th, killed the vines.

Egg Plant.—The Egg Plant is one of the least known garden vegetables and one that deserves being better known. This plant is related to the tomato, and requires the same conditions to make its best growth. As it is a warm climate vegetable, it is best to start the plants in the green house or hotbed and have them in blossom when the weather will permit setting in the field. This, at the altitude of Fort Collins, is usually about May 25th to June 10th. These plants should be given as little water as possible and frequent shallow culture. In the Experiment Station plots, Black Beauty proved to be the most valuable variety. Plants may be set two feet apart with rows three feet apart. The little black flea beetle and striped potato beetle are the most serious insect pests of this vegetable. The best remedy found in our plots was to spray the plants with a rather strong application of arsenate of lead. This should be done as fast as the plants are set out, as the flea beetle is apt to be at its worst about the time the plants are ready to be set in the field.

Melon.—Melon growing in Colorado, is so well known that little need be said in regard to it. The melon requires a warm climate and thrives best on a sandy loam soil. The Arkansas Valley district has been noted for several years for its high quality melons. Other sections of the State, notably the Lower Grand Valley and the Uncompahgre Valley, are rivaling the Rocky Ford district. The Greeley district is also producing melons in a commercial way. The soil of Fort Collins is not well adapted to melon culture, and none have been tried in the Experiment Station gardens.

Onion.—The onion is another vegetable that is becoming of commercial importance in various districts of the State. The requirements for the onion are rich loamy soil that can be easily irrigated and worked, and where sufficient stable manure can be obtained to keep the land in the very best condition. For this reason the onion industry is largely confined to areas close to the cities of the State. The greatest drawback to onion growing is the uncertainty of the market. The yields in the State are fairly uniform, and failures are rare. Yields of 300 to 400 sacks, that is, 600 to 800 bushels are not uncommon, but the average is much less than this. The onion requires a fairly long season to mature, therefore is best planted as early in the season as possible. In fact onion seed may be planted in the fall. In the Uncompahgre Valley where the spring is early the seed is frequently sown in February. The ground should be prepared by being preceded by potatoes or some other hood crop that will free the land from coarse vegetable fiber and weeds. It should be thoroughly harrowed and leveled

after being plowed, so as to make a fine smooth seed bed. Two systems of growing are used in the State. One, the flat system has rows 12 to 14 inches apart. The other is known as the double row system. That is two rows are close together, with a wider space between. In the Greeley district, irrigation is given by means of flooding. Few diseases trouble the onion crop. Occasionally some loss is sustained from onion rot. A small insect known as "thrips" cause considerable injury to the onion in this State. This insect is so small as not to be ordinarily noticed. A grayish appearance of the leaves and stems; together with a tendency of the leaves to twist, indicate the presence of this insect. This pest is not easily destroyed. About the only means of control is by spraying with some contact insecticide as black leaf sheep dip or a soluble oil. These are seldom very satisfactory, owing to the fact that the insects are for the most part between the leaves, where they are protected from the spray. The varieties mostly grown in the State are the Red Globe, Red Wethersfield, Yellow Globe Danvers, White Globe, and Prize Taker. Onions for family use may be grown in all altitudes and soils of the State. In heavy soils there may be trouble from the seed not being able to prick through the crust. This may be overcome by keeping the soil moist at the time plants are appearing through the ground. In keeping onions for winter, it is best to have them in a cool dry place.

Peas.—Peas are well adapted to practically all districts of Colorado. Northern Colorado is becoming noted for its production of the garden pea for canning purposes. Factories have been established at Longmont, Loveland, and Greeley. The cultivation of this plant is very simple. For garden use it only need be planted early in spring, in drills from two to four inches deep. The wrinkled varieties are somewhat prone to rot in the ground when planted in heavy soil. Few insects or plant diseases trouble peas in Colorado.

Pepper.—The pepper is similar to the egg plant and tomato, so far as soil requirements are concerned. The plant does its best in a rich warm soil. It may be grown, however, in any of the agricultural districts of the State, provided the plants are started early enough to have good sized plants to set when the soil is sufficiently warmed for planting in the field. The seed of the pepper is very slow to germinate, so that plants should be started earlier than for tomato, or cabbage.

Salsify.—This vegetable is comparatively little known, but is desirable as a winter and spring vegetable and is recommended for the home garden. The culture of this plant is very simple. Seed may be sown in drills in the garden at any distance apart that may be desired. The seeds are almost sure to grow, so that a good stand

may be expected. In the fall the roots may be dug and stored in the cellar, or left in the ground until wanted for use. When stored in the cellar they should be covered with soil or sand to prevent shriveling. It is thought by some that freezing improves the quality of the root. Rust frequently attacks the leaves of this plant, but is not usually serious enough to make an appreciable difference in the size of the roots.

Squash.—The squash is somewhat uncertain from a standpoint of production. Some years this vegetable produces so heavily as to be exceedingly profitable, even though the price is not high. Other years the yield is scant. This seems to be more a matter of the season, than from any organic difficulty. The culture of the squash is simple. A warm dry soil is most favorable to its development. Some particularly good specimens of Warty Hubbard, have been grown in Northern Colorado districts. The smaller varieties as Burpee's Ford Hook, are better adapted to the higher altitude and short seasons. One of the worst enemies of the squash is the so-called squash bug. This insect is hard to destroy as it cannot be poisoned. The best remedy, where only a few plants are grown, as in the garden, is to lay pieces of boards on the ground near the plants. The insects will collect under these boards during the night, and may be killed early in the morning.

Tomato.—Tomato growing in Colorado is becoming one of the agricultural industries. This crop has been grown in the Arkansas Valley for quite a number of years, but in the past few years, tomatoes have been grown in the Northern Colorado district from Denver to Greeley for canning purposes. Until recently, nearly all the canned tomatoes of commerce were put up in the eastern states, as Michigan, Delaware, and New Jersey. There the seasons are somewhat more favorable for securing larger yields than in Colorado. However, the yield here is oftentimes equally as good as in the eastern states, and the quality is superior. The tomato thrives in a warm, sandy soil. For that reason this plant demands frequent shallow cultivation. Tomato growing in a commercial way is confined to the lower altitudes in the State. For home use this vegetable may be grown at an altitude of 7,000 to 8,000 feet. In the high altitudes, particular care should be taken to have the plants as large as possible when the ground is ready for setting in the open field. In the Experiment Station gardens, tomatoes were set this year on several different dates. The first setting, made May 10th, was injured by the freeze of May 16th to such an extent that it was necessary to reset plants although the plants first set were well hardened. The second setting was made May 25th. June 4th, two rows of Earlina plants were set that had been grown in six inch pots in the green house. These toma-

atoes were in blossom at time of setting, and were not disturbed sufficiently to check the growth. The first tomatoes picked, July 23rd, were from this plot. June 15th another plot of Earlina tomatoes was set. These plants being set so late, never reached a sufficient size at maturity to make the yield that the earlier set plants made. The area of the whole plot was 28/100 of an acre. From this two and one-half tons of tomatoes were picked. The soil of these plots is not well adapted to tomatoes, nor is the climate of Fort Collins considered to be as well adapted as places farther out on the plains. As a result, few tomatoes are planted in this district, and prices are always higher than in Greeley or the other canning centers. For this reason it is an incentive for the enterprising gardener to grow this vegetable where it is not ordinarily grown. For the high altitude, it is best to select the earliest maturing varieties as Burpee's Early, Spark's Earliana, June Pink, etc. The seed should be started in the green house or hot bed about April 1st. As soon as the plants are sufficiently large to prick out, they should be put, either in other flats one or one and one-half inches apart, or they may be transplanted directly to the hot bed or cold frame as the case may be. They should be, at least, one inch apart, and two inches apart each way is better. These plants should be from six to ten inches high when set in the open ground. If space is available so that plants may be grown individually in four to six inch pots, two or three weeks may be gained in securing early fruits. In any case, great care must be exercised to see that the plants are thoroughly hardened by exposure to the outside air, before being set in the field. Otherwise, a cold wind even several degrees above freezing, when first set, will frequently kill the plants. On the Eastern slope, the potato flea beetle, and the striped potato beetle are serious pests to the tomato. Our experience in this line so far has led us to favor spraying the tomato plants with a strong mixture of arsenate of lead and water, as fast as the plants are set in the ground. This either prevents the insects from working, or kills them if they attack the plants. None of the leaf fungi that are so destructive to the tomato in the East are troublesome in Colorado, nor is there any serious trouble from rotting of the fruit. One soil fungus, *Fuserium*, occasionally causes losses in the fields. As yet, we are not certain whether this fungus is native in the soils, or is carried to the fields with the plants from the cold frames. The first indication of the trouble is a yellowing and withering of the leaves, followed by shriveling of the plant. If the plant be examined, it will be found that the stem under the ground and above ground also is discolored throughout the vascular system, or sap wood. There is no known remedy for this disease. It may be partly prevented by making sure that the seeds are sown and

plants grown in soil which has not grown tomatoes before, and in rotating the crops, so that tomatoes do not follow tomatoes.

A CABBAGE BREEDING EXPERIMENT.

The Cross cabbage, which is extensively grown in Greeley for shipping, is believed to be an accidental cross between the Winningstadt, and Henderson's Flat Dutch. This cabbage is globe shape in form, and is about half way in season between its two parents. Since the origin of this variety at Greeley by Mr. John Levy, the seed has been grown at that place, so that the variety has been kept practically as first introduced. This cabbage has proved very desirable in the district, but has had one serious failing. Great care has been exercised by those who grow the seed to select heads that were true to type for growing the seed. Notwithstanding this precaution, there is quite a per cent. of the crop that has reverted each year to one or the other of the parents, that is, there are always in the field, many heads that are flattened as the Flat Dutch, and many that are pointed as the Winningstadt. Some of the growers have laid this to uncongenial soil or climatic conditions under which the cabbages were grown. According to Mendel's law, some of these plants should have an inherited tendency to revert each year to the original parentage. In order to ascertain if this principal were true with cabbages, and also to eliminate the trouble if possible, an experiment was started a year ago. First, individual heads of this type were selected in the fall of 1908 for growing seed the following year. In the spring of 1909, several of these heads were planted separately in different places where there would be no chances for the seed to cross pollinate. The rest of the heads were planted in a single row in a garden. All the plants that were set by themselves were sterile or practically so; only a few small seed being developed. Seed was saved from all of the other plants separately, as well as from the several plants from a field at Greeley. These seed were sown separately in the spring of 1910. Later they were transplanted to the field, and stakes set so as to mark off the progeny of each separate plant. Some interesting and valuable results have followed. Of the fifty plants whose progeny was set in the field, only four plots produced heads that were all true to the Cross type. Great variations occurred in the rest of the plots. Some were pointed, following the Winningstadt type, both in shape and earliness; others followed the Flat Dutch, the other parent. In many plots flat, pointed and globe cabbages all came from the same plant. The plants from the plots that were all true to the type have been saved for further experiment, as have also some of the heads of good type from the plots that had various types. Theoretically these plants that are all true to type this year, should continue true to this type. If this proves true, the trouble from changing the type of head will be at an end.

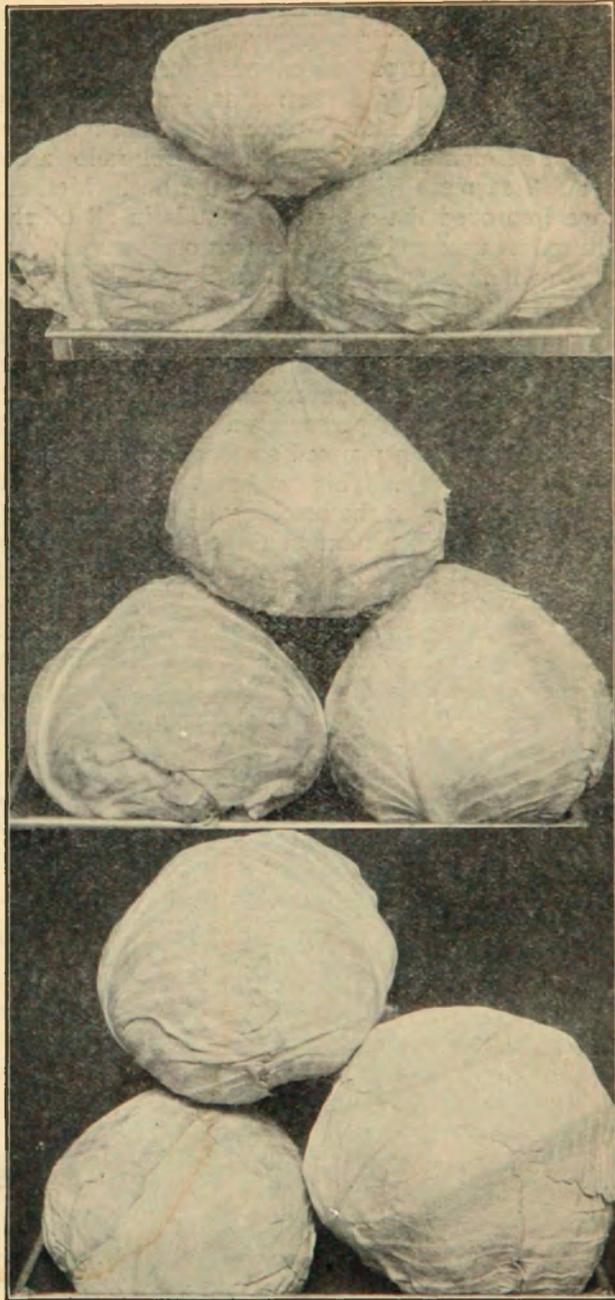


PLATE II.—CROSS CABBAGE.—Upper and middle figures, reverted to Flat Dutch and Winningstadt; lower figure, true type of Cross.

HINTS FOR GARDENING.

Colorado ranchmen have the reputation of not liking the so-called intensive employment. A trace of the old horse-back farming is still to be found in the ideas of most Colorado farmers. For this reason few farmers take kindly to the hoe. Methods in gardening have improved the same as methods in all other branches of agriculture. It used to be thought that onions, strawberries, etc., should be grown in a so-called bed; a little space of ground ten feet wide by twenty feet long. It is found to be much more economical of time and labor if all garden vegetables are treated in more or less the same way as our field crops. The ground should be prepared as for a crop of potatoes or grain. If a garden is to be made with several of the perennials as rhubarb, horse radish, asparagus, etc., it should be planned so these may grow all together on one side of the garden. This strip may be left without plowing and will not interfere with the breaking of the rest of the plot. It is well to start the garden next to these plants and run the rows in the same direction. Not less than three feet of space should be left between rows of all garden crops, including onion, lettuce, etc. Where it is desirable to economize space, many of these smaller vegetables may be put in what is known as the double row system. That is, two rows are planted from six to twelve inches apart, then a space of three feet is left for cultivating. There is always a tendency to crowd all vegetables, with the result that the size and quality is frequently sacrificed. The first row should be marked with a line. If a garden drill is to be used the marker will mark the rows ahead so that the line need not be used further. Where a garden drill is not used, it may be desirable to stretch a line and then make a mark by running a bicycle over the ground under the line. If a single wheel is used for this purpose the row will be more or less crooked. Where the bicycle is used, the second wheel corrects the inequalities of the front wheel so the mark will be pretty straight.

Where irrigation is practiced there is always a tendency to use a great deal of water, and to do little cultivating. It is always better to use little water and more cultivation. Thorough frequent cultivation prevents evaporation, and makes plant food available as well as keeping the weeds from getting started. The garden should be cultivated not less than once a week until the plants are too large to get through with a horse. For corn and vine crops as squash, cucumber, etc., it is well to make the space between the rows greater than three feet. An abundant supply of well decomposed stable manure will help to warm the soil and mature the vegetables where the altitude is high and the seasons short.