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ONION GROWING  
In the Cache a la Poudre Valley.

—BY—

WENDELL PADDOCK.

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Plate I. Three hundred and twenty sacks per acre.

# ONION GROWING IN THE CACHE A LA POUDRE VALLEY.

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BY WENDELL PADDOCK.

Colorado is remarkable for its special crops which have been developed to a high degree of perfection in certain localities. And of these, few have attracted more attention than onion growing in the Cache a la Poudre valley. As early as 1880 a few gardeners in the vicinity of Laporte, began to grow more onions than were required to meet the local demand. Much of the surplus was hauled by wagon to Cheyenne, Wyoming, or it was disposed of to ranchmen, and in small towns where there was no local supply. At this time onions brought from \$1.75 to \$1.90 per hundred pounds. Commission men from Greeley were not slow to recognize in this crop a valuable means of supplementing the sale of potatoes. These men soon became the principal buyers. With the advent of the commission men, the acreage devoted to this crop increased rapidly, until now onions are grown in varying amounts on the bottom lands adjacent to the river from the foot hills to its junction with the Platte at Greeley, a distance of forty miles; the territory adjacent to Fort Collins still continuing to grow the largest acreage.

While the price of onions has been reduced to a minimum, 65c to 75c per hundred pounds being the average price in the fall, yet the crop is usually a paying one. Owners of small tracts of land find it profitable to put in small patches of the best soil, and perhaps the larger part of the onions is grown in this way. But occasionally a twenty-five-acre field is seen, and ten-acre fields of onions are not at all uncommon.

*Soils.* The onion thrives best in a cool, moist soil, the surface of which is easily kept in a mellow condition. Such soils are mostly confined to river bottoms, and they contain more vegetable matter and more sand than is commonly found in Colorado soils. Large amounts of decayed vegetable matter seem to be essential to the best development of this crop. Many of the best onion districts in the East, as well as in California, are located on reclaimed swamp land. One very important effect of the vegetable matter is that it improves the physical condition of the soil,

and if this is combined with a certain amount of sand a loam is formed that is easily made into the proverbial onion bed.

Heavier soils are not suitable for onion growing, for the following reasons: It is difficult to make a good seed bed, free from lumps. The seeds do not germinate quickly and the young plants are fragile, consequently much damage is done if the ground bakes or cracks, as it is liable to do, before the plants come up. Germination may be seriously interfered with, or the young plants killed or injured so that their development is checked. Such soils are difficult to cultivate, especially when the plants are small, and after irrigation is begun the tendency to bake is greatly augmented. The percentage of scallions, or thick-necked onions, is much greater on such soils.

The onion plant is a surface feeder, consequently it must have an abundant supply of readily available plant food in the surface soil. If the ground is compact the roots cannot nourish the plant properly, even though plant food is abundant. Then, too, the bulb must be free to expand naturally on the surface of the ground, which it can only do when the soil is loose. If the soil is compact, development is arrested and the onions are small and many scallions are formed. Many onions are grown on soils that are heavier than is desirable, but special care is taken in irrigation and cultivation.

*Preparation of Land.* In preparing land for onion growing, the growers are divided in their opinions and practice in regard to spring and fall plowing. Perhaps the majority plow in the spring or late winter. Fall plowing has advantages for certain soils, as it tends to kill out weeds, such as wild oats, and if the ground is inclined to be lumpy the action of frost tends to reduce the lumps and thus much time and labor is saved.

After the ground is plowed it must be harrowed and gone over with a clod crusher until it is in a fine state of tilth. Ground as ordinarily prepared for wheat will not do for onions. After the soil has been thoroughly prepared the surface must be leveled so that there will be no possibility of water standing on any portion of the field.

*Fertilizing.* Rotation is not usually practiced, the same land being planted to onions for several years in succession. Comparatively large amounts of manure are required to keep up the fertility of the soil under these conditions. The practice of some growers is to apply from 30 to 40 tons of sheep or horse manure per acre once in two years, while others make a similar application every three years. Of the two kinds, sheep manure is preferred. Commercial fertilizers have probably not been tried in this valley.



Plate II. Single row system of planting.

*Seeding.* Seeding is begun as early as March 15, and is continued as late as April 20, though it is desirable that all seed be in the ground by the 10th of April. The importance of early seeding should be emphasized, as it is essential that the bulbs make as much growth as possible before the hot weather of mid-summer comes on. The seed is sown about one inch deep, with hand seed drills, using from three and one half to four pounds of seed per acre. The distance between the rows depends on the system of irrigation to be followed. If the field is to be flooded the rows are usually made 12 or 14 inches apart (Plate II). But if the furrow system of irrigation is adopted, the ground is plowed out in ridges after it has been thoroughly prepared. The ridges are made 30 inches apart and then flattened to about nine inches on top. Two rows, three inches apart, are planted on each ridge; the furrows between the double rows being used for irrigation and for cultivation (Plate III). Most growers try to plant the seed so that the plants will be one and one half inches apart in the row, so as to avoid thinning. In fact, but little thinning is done in this vicinity.

*Cultivation.* Cultivation and weeding is begun by hand as soon as the plants appear above ground. Cultivation is given with a hand wheel hoe, while weeding and thinning, if thinning is necessary, must be done by hand. The number of hand weedings that are necessary will depend on the season, but usually three are sufficient. The ground should be cultivated after each weeding, and at such other times as the season indicates. Four or five cultivations are required in the vicinity of Fort Collins.

It is important that weeding be attended to promptly, lest the plants become weak and spindling from the crowding of the weeds. Many plants may be killed during the process of weeding, and others may soon dry out and die as a result of being suddenly exposed to the sun.

*Irrigation.* Specific directions for irrigating onion fields cannot be given, since methods must necessarily differ in different fields and in different seasons. In the first place, damp, but not wet soils, are selected, when possible. Such a soil does not need much water in the fore part of the season, and when of the proper texture the fields may be flooded, when water must be applied without damaging the crop by subsequent baking of the surface. In the vicinity of Fort Collins irrigation is not begun before the first of July, and is continued at intervals of ten days or two weeks, according to the conditions of the season. Further down the river, where heavier soils are used, the ground is irrigated by running the water in furrows between double rows, as mentioned above. In this case irrigation is started the same day that the

seed is planted, if the ground is dry, or as soon after as possible. Subsequent irrigation will depend on weather conditions, but close attention must be given to see that the ground is kept moist. On the other hand, too much water must not be applied, as it results in the formation of scallions and of spongy bulbs.

*Harvesting.* Onion harvest is commonly begun by the 15th of September, and the crop is usually out of the field by the middle of October. Harvesting should begin promptly when the bulbs are mature, as is indicated by the withering of the tops and the yellowing of the necks.

The onions are pulled by hand and thrown into windrows, where they are allowed to remain for several days to cure. After the curing process is complete the bulbs are topped, sorted and sacked. Topping is done by cutting off the tops about half an inch above the bulb, care being taken to make a smooth, clean cut, and not to injure the outer coverings. If more top is left on it detracts from the appearance, and if cut closer the bulb is liable to be injured.

The onions are now sorted and sacked in the field, making but one grade. The small and unmarketable bulbs, together with the scallions, are left on the ground. Gunny sacks which hold about 100 pounds are the only packages used.

Ordinarily damage by rain is not feared after the onions are sacked, but if they do become wet they should be left in the field until dry. The sacks should be turned as soon as the tops are dry in order that the bottom of the sacks may have an equal chance to dry out. This is especially true if the ground is wet.

The growers do not usually attempt to hold their crop, but haul it directly to the car or to the dealer's warehouse. All onions should be out of the field by the first of November.

*Markets.* The principal market for Colorado onions is in Texas, though some are sent to Oklahoma and Indian Territory, and occasionally they are sent as far east as Kansas City and St. Louis. A portion of the crop is disposed of by the dealers soon after it is delivered by the growers, but perhaps two thirds of it is held until February. Onions that are held any length of time in storage must be resorted before they are placed on the market.

*Varieties.* A great many varieties of onions have been tested by the growers in this district, but none have been found that meets all requirements as well as the Yellow Globe Danvers. It is practically the only variety grown. A few Red Danvers are grown, but the amount is scarcely worthy of mention. The Yellow Globe seems to be well adapted to our conditions of soil, altitude and climate; it yields well, keeps well, and its size and appearance meet the demands of the market.



Plate III. Double row system of planting.



Several years ago Mr. A. T. Gilkison, of Laporte, experimented with transplanting Prizetaker onions, as is extensively practiced in other states. The onions yielded well but the bulbs did not keep well, and were larger than the market demands. Judging from this experience, the so-called new onion culture is not adapted to our conditions.

*Seed.* Too much attention cannot be given to procuring good seed. If the seed is old, its germinating powers may be lost or impaired, and if close attention is not given to selecting the best bulbs for seed, the stock deteriorates rapidly. Poor seed may be accountable for a poor stand, many small and immature bulbs, or a large per cent. of scallions. Onions grown from seed as commonly supplied from seedsmen, are so greatly influenced by our conditions of altitude and climate that the growers soon began to raise their own seed. The larger part of the seed now sown in in this valley is home grown.

*Cost of Growing.* Onion growers differ in regard to the cost of producing this crop. Of seven growers consulted, one estimated the expense at \$90 an acre; another at \$50. The other five gave figures varying between these extremes. It is probable that on an average \$60 will cover all the expense, excepting the cost of manuring, from plowing the land to loading the onions on the cars.

*Storing.* It has been found that onions keep better in rooms above ground than in cellars. Such rooms should be open so as to admit of a free circulation of air until there is danger of freezing. When severe weather comes on a stove should be placed in the room if necessary to keep the bulbs from freezing. There is always more or less loss in storing onions, as many of the bulbs sprout, especially if they were not thoroughly cured; and others will decay, even though they have been only slightly bruised. In any case there will be a large shrinkage, and if the ventilation and temperature are not closely attended to, large losses may result.

Onions are sometimes kept by allowing them to freeze. If they can be kept frozen and allowed to thaw out gradually just before marketing, no harm results. But successive freezing and thawing injures the bulbs. In general this method of keeping onions cannot be commended.

*Insects and Diseases.* Fortunately but few insect pests or plant diseases have appeared in Colorado. Grasshoppers occasionally feed on the tops, but they do not often appear until comparatively late in the season, after alfalfa and similar crops have been harvested. They may be successfully combated by scattering poisoned bran along the sides of the field. The mixture is made

in the proportion of one pound of Paris green to twenty pounds of bran, with enough water to thoroughly moisten the mass.

A minute insect known as thrips is present every year. It sucks the juice from the leaves, causing them to have a sickly, blighted appearance. These insects do considerable damage, especially in hot, dry seasons; but as yet no method of combating them is in use.