

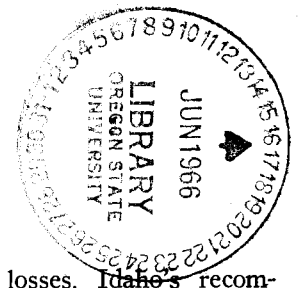
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Vegetable Seed Production

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Carrot and Parsnip

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CARROT

Most of the carrot seed produced in Oregon is grown in the irrigated section of Malheur County. While the better soil types in western Oregon will produce good yields of carrot seed, the widespread occurrence of wild carrot is a menace to the purity of the seed grown in this region.

Both the transplant method and the seed-to-seed method have produced satisfactory seed crops. The one most generally accepted by the majority of seed growers is the transplant method, which requires two full seasons. During the first year the roots are grown, selected for type, and then stored during the winter. The spring of the following year the roots are planted and the seed harvested during late summer.

Producing and storing roots

Roots for seed are produced in the same manner as for market or for winter use. They should be grown on well-drained, deep loamy, or sandy loam soils. Good drainage is essential for carrots since bacterial soft rot may develop in roots grown on soils that retain moisture too long. At least 2 years, or preferably more, should elapse between growing crops susceptible to Sclerotinia rot and Botrytis (such as beans, peas, and lettuce) and growing carrots for seed.

Seeding date, fertilization, thinning, and irrigation practices should be aimed at the production of uniform, medium-sized roots, 1 1/8 to 1 3/4 inches in diameter. Seeding should be made before mid-June on a moist, well-prepared, and weed-free seedbed. Row spacing will vary from 14 to 30 inches, depending on the method of cultivation to be used. Seeding rates vary from 2 to 4 pounds per acre, each acre providing enough roots to set out 5 to 8 acres for seed the next year.

The need for hand weeding in carrots has practically been eliminated. Follow the recommendations outlined in the *Oregon Weed Control Handbook*.

When the roots are dug in the fall, only those that are clean, sound, and well topped (not closer than 1/2 inch from crown) should be stored. Those which have been bruised, caked with soil, and topped carelessly are

the source of heavy storage losses. Idaho's recommendations for cellar storage point out the need for sanitary facilities. All refuse from previous storage should be properly disposed of. The floors, racks, and bins of the cellar should be sprayed thoroughly with a copper sulfate solution. If crates are not used for storage, the roots should not be piled more than 2 1/2 to 3 feet deep on slatted decks, leaving about 18 inches of air space between the top of the pile and the next higher deck. Temperature throughout the storage period should be as near 33 degrees F. as possible. If roots are stored in a pit, it is important to locate the pit in clean soil, on an elevated site, and on land which has not previously been planted in carrots.

Producing the seed

Soil types best suited for the seed crop year are deep silt loams and clay loams with good drainage and high fertility. They should be deeply worked and in good tilth at the time of transplanting.

Early in the spring when danger from severe frosts is past, carrot roots, called "stecklings," should be planted immediately after removal from storage. A drastic reduction in survival and yield occurs if roots are removed from storage more than 5 days prior to planting.

In the transplanting operation, the soil should be well firmed around the roots and the crown should be even with the surface or slightly under the surface of the soil. For rows spaced 36 inches apart, a spacing of 8 to 12 inches within the row is better than wider spacings.

Carrots respond to heavy applications of fertilizer, and high fertility is one of the most important considerations in insuring a satisfactory crop. Apply 30 to 60 pounds of N and 60 to 100 pounds of both P₂O₅ and K₂O in bands at time of planting. In May or early June make an additional light application of nitrogen fertilizer.

The blooming period of carrot plants is long. As a result, the seed clusters vary considerably in maturity. The crown set or top seed cluster matures first, followed by the secondary, and finally the tertiary bloom.



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As a result of this uneven maturity, a small percentage of the seed may be lost by shattering. In small plantings or in extremely weedy fields, individual seed heads should be picked by hand as they ripen. Three or four pickings are usually necessary to obtain all of the seed by this method. Under ordinary field conditions, however, harvest should be done at a time when the majority of the seed clusters are dark brown and before all the tertiary seed clusters are fully mature. This stage of maturity is usually reached about the first of September.

The crop can be swathed or bound into bundles and put in windrows or shocks for curing. When the seed is thoroughly dry, either the combine or stationary thresher, if properly set, is satisfactory for threshing. Scarification or the removal of spines on the carrot seed is necessary and may be accomplished during the threshing or as a separate operation after threshing.

Yields ranging from 600 to 800 pounds are considered good by experienced growers. Yields of more than 1,500 pounds of seed per acre have been reported on soils of high fertility.

PARSNIP

Parsnip is a hardy, tall-growing biennial particularly well adapted to Oregon for seed production purposes.

The root requires a long growing season, but in the second year it bolts quickly and the seed matures about the last of July in the Willamette Valley. Acreages have been small because of the small amount of seed required to meet needs. Yields as high as 2,400 pounds of seed per acre have been reported for the Willamette Valley and yields of 1,500 to 1,600 pounds have been common.

Parsnip varieties intercross readily and also cross with wild parsnip. Cow parsnip will not cross with the cultivated parsnip, but it is a host plant for the parsnip web worm, a very serious insect pest which may reduce the crop by as much as 75%.

Seed can be produced either by the seed-to-seed method or the transplant method. Seed-to-seed is the most economical and is preferred for commercial seed production. Where the main interest is one of growing stock seed, the transplant method is preferred. Seed-to-seed production has a yield advantage over the transplant method.

With the seed-to-seed method, parsnip is sown thinly in rows 3 to 3½ feet apart between May 15 and June 15 at 3 to 4 pounds per acre. Because parsnip seed is slow to germinate, it is usually advisable to prepare the seedbed early in the spring and destroy a crop of weeds just before seeding by light cultivation or use of a chemical. Chemical weed control is the same as for carrots.

Irrigation may be necessary to put the ground in a suitable condition for planting and seed germination and to soften the soil crust for seedling emergence.

Fertilize at seeding time with 40 to 60 pounds of N and 80 to 120 pounds of P₂O₅ per acre. Early the next spring (after overwintering) broadcast light applications of nitrogen. All fertilizing and cultivating work should be completed early in the spring because parsnip gains height very rapidly. Some growers make a practice of thinning the plants to a distance of 8 to 12 inches apart in the row, while others prefer to grow the plants to maturity in a relatively thick stand. Parsnip grown seed-to-seed usually grows taller but develops less lateral spread than when produced by the transplant method.

Roots for the transplant method of seed production are produced in the same way as in the seed-to-seed method, except that the rows should be spaced closer together and slightly heavier seeding rates should be used. Instead of going through to maturity in an undisturbed condition, the roots are plowed out either in late fall or in early spring, sorted for type, and transplanted without delay into freshly and deeply worked soil. Transplanting of roots may be done in the fall, but it is usually more convenient to transplant in early spring as soon as the ground can be worked. Rows are ordinarily spaced 3 to 4 feet apart, with the roots spaced 1 to 2 feet apart in the row. Spacing of plants within the row makes very little difference in the seed yield of transplanted parsnips. Roots over 1 inch in diameter are slightly superior to roots less than 1 inch in diameter.

Parsnip seeds are produced in umbels or heads with two seeds formed together flat against each other. Harvest when the seeds begin to separate and the majority of the seed in the center umbel turns brown and the remainder of the umbels begin to take on a brownish cast.

In small acreages the plants are usually cut with corn knives and laid in windrows to cure. For larger areas, parsnip is either cut with a swather or by hand. When a swather is used, the plants should be cut at a slightly immature stage to prevent excessive shattering. Parsnip seed threshes easily when dry and can be threshed with conventional equipment. Breaking up of the flower parts should be avoided insofar as possible because they are extremely difficult to separate from the seed except with the aid of special cleaning equipment. Even at best, parsnip seed is difficult and costly to clean.

Some farmers do not like to grow and handle parsnip because of its toxic effect on the skin—particularly from flowering time through maturity. The toxic substance may produce blisters on exposed skin. When working with parsnip after it has flowered, wear gloves and protective clothing.