

Commercial Onion Production in Oregon

Onions are produced in Oregon in three major areas. In the Milton-Freewater and Walla Walla areas onions of the Sweet Spanish type are grown by direct seeding and from transplants. In the Ontario and Nyssa areas, the Sweet Spanish type is grown from seed, mostly for fresh market. Some are frozen into french fried onion rings and into special packs with other vegetables. A few are dehydrated. In western Oregon, Yellow Globe Danvers is largely grown on muck soils in the Lake Labish area near Salem and in the Gaston and Sherwood areas west and south of Portland. A few onions are grown in the Medford-Central Point

area. Limited amounts of bunching, pickling and onion sets also are grown in Oregon.

Onion Varieties for Oregon

Area	Type	Varieties
Milton-Freewater, Walla Walla	Sweet Spanish	Local strains, El Capitan, Treasure, and other hybrids
Ontario-Nyssa and Medford-Central Point	Sweet Spanish	Peckham strains, El Capitan, Amigo, Monarch, Bronz Wonder, Early Shipper, Treasure, and other hybrids
Willamette Valley	Storage Onion	Yellow Globe Danvers, local strains, Spartan Sleeper, Mucker, Spartan Banner, and other hybrids
General	Bunch. Onions	Beltsville White, White Portugal
	Pickling	Crystal Wax, White Grano, Eclipse, and Barletta



Onions are Oregon's number one fresh market vegetable crop.

Varieties grown in Oregon for bulbs are of the long day type. Sweet Spanish types are large (4-5 inches) in size and the Danvers are medium (2-3 inches) in diameter. Picking onions are short day varieties which are planted at very high seeding rates, with Crystal Wax being the most common variety.

Planting

Onion type	Pounds seed per acre	Seeds per foot	Spacing between rows
Bulb (Danvers)	2-3	6	12-14 inches
Bulb (Sweet Spanish)	1½-2	5	12-14 inches
Bunching	20-30	14	12-14 inches using split or scatter shoe
Drying Onion Sets	50-80	30	12-14 inches using split or scatter shoe
Pickling (pearl onions)	100-120	Solid	3-4 inch multiple rows using split or scatter shoe. Planted in beds

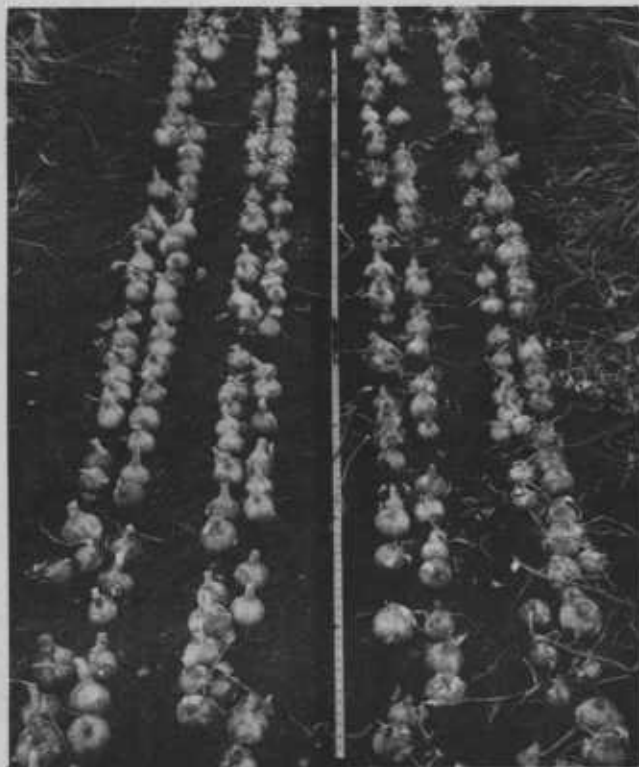
Extension Circular 817

Revised May 1979



OREGON STATE UNIVERSITY
**EXTENSION
SERVICE**

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Double-row planting pattern at Les Klampe farm, Lake Labish, Oregon, shows high degree of planting precision, resulting in outstanding uniformity in size of onions. This was a flatland planting with overhead irrigation. Seeds were spaced $2\frac{1}{2}$ inches apart and staggered in lines to provide size required by grower. *Photo courtesy Germain's, Inc.*

Experiments on the Danvers type have shown that closer row spacings would be very effective in increasing yields of bulb onions. Row spacings down to six inches providing 24-30 square inches per plant have returned the highest yields of onions three inches or larger.

Precision planters are available to uniformly distribute the proper quantity of seed along the row. This results in the highest percentage of large



Some precision planters can accommodate pelleted onion seed. This tractor also is equipped with fertilizer and pesticide tanks.

onions. In precision planting, uniformity of seed size is extremely important. Seed may be sized or pelleted for use in various types of precision planters.

Planting dates in the areas are: Eastern Oregon, March 15 to April 15; Medford, March 1 to April 1; Western Oregon, April 1 to May 10. When onions are grown in Western Oregon for early fresh market using the late maturing Sweet Spanish type varieties or the early mild Bermuda, they must be started from transplants to obtain early maturity, adequate size, and enough time for curing.

Pest Control

The most common insects are the onion maggot and thrips. Wire worms occasionally cause some loss of stand.

Pink root, downy mildew, and onion smut are the major field diseases with botrytis, neck rot, sour skin, and other disorders appearing during the curing and storage periods under certain conditions.

Chemical weed control is available to reduce the need for cultivation on both mineral and muck soil. The preparation of a uniform, smooth seedbed is important in obtaining an even distribution of seed, uniform emergence, and good herbicide incorporation. Proper seedbed moisture is necessary to insure good seed germination and to activate most weed control chemicals.

Onions are extremely sensitive to most herbicides just after emergence and until after formation of the second true leaf. Since they grow very slowly during this period, chemicals are usually applied prior to emergence. A stale seedbed technique might be useful on new ground. This involves preparation of a seedbed allowing the crops of weeds to emerge, killing these with a suitable contact herbicide without disturbing the soil. The onions are then seeded with minimum soil disturbance and herbicides are applied as recommended for pre-emergence weed control. Because of the time required for this practice, it is useful only for fields planted in the mid or latter part of the planting season.

Disease, weed, and insect control recommendations are revised annually as new pesticides become available. Consult Oregon State Disease Control, Weed Control, and Insect Control handbooks for the latest information.

Fertilization

Excessive rates of nitrogen can make onions difficult to cure. In Western Oregon it has been shown that copper and sulphur addition are also

sometimes necessary. In Eastern Oregon zinc is sometimes deficient and is broadcast before planting. Other fertilizer nutrients which may be needed are indicated in the following table.

Suggested Fertilizer Rates			
Nutrient	Total Pounds per acre		Remarks
	Mineral soil	Organic soil	
N	100-160*	20-40	Banded at planting.
P ₂ O ₅	60-80	80-120	Banded at planting.
K ₂ O	as needed	80-140	Amounts in excess of 60 pounds broadcast before planting.
pH	6-6.5	Not critical	Avoid pH's below 5 on muck soil.
Cu	6-12	25-50	Broadcast before planting. Not to be applied annually.
S	40	40	Include in fertilizer in western Oregon.
Zn	4-5		Eastern Oregon. Broadcast before planting on basis of soil test.

* Sidedress 80-100 pounds before plants are 6 inches high depending on amount of N banded at planting.

If all N, P₂O₅, and K₂O are broadcast, use 20 percent higher amounts than those rates suggested above.

Irrigation

Either sprinkler or furrow irrigation can be used. Frequent light irrigation to keep the soil surface moist may be necessary to secure good germination and prevent crusting. Solid set sprinkler systems are ideal for this purpose. After emergence, the young seedlings are easily killed by drying and must be continuously supplied with

adequate moisture. Continuous growth from germination to maturity is necessary and requires that this crop never suffer from lack of moisture. Moisture must be maintained in the top six inches of soil regardless of sub-soil moisture supply or total rainfall. About three inches of water per irrigation by furrow or two inches per irrigation by sprinkler is usually applied. A total of 15 inches of irrigation water is usually required. Irrigation requirements are reduced as onions begin to mature. When the tops of the onions begin to break and fall over, irrigation is terminated to prevent second growth in the bulbs and to allow the tops to dry out. Any moisture or rainfall during maturing and curing increases the severity of neck rot during storage.



Onion diggers with roller toppers are often used to harvest sweet Spanish onions in eastern Oregon.

Harvesting

The harvest period for seeded onions usually begins in late August and continues through October. They are ready to lift after 25-50 percent of the tops are down. Crops intended for short-term storage may be lifted when the tops are 15-25 percent down, but onions intended for longer storage should have about 50 percent of the tops broken over. Pickling onions are harvested when the bulbs are ¾ to 1½ inches in diameter.

Bulbs are lifted by machine or by hand and placed in windrows or slotted cases to cure. The leaves of the plants, or the crates are arranged to protect the bulbs from sunburn. Bulbs are sufficiently cured when the scales are dry and brittle and juice cannot be squeezed from the neck at the



Irrigation is an integral part of Lake Labish onion production.

points where leaves break over. Tops are often left on bulbs intended for long-term storage. Tops are always removed before grading and packaging. Harvesting and handling machinery is available for complete mechanization. Use of tote bins for ease of handling is a common practice. Bulk storage of onions in specially designed buildings is increasing. Such buildings use forced air, which may be heated, to properly cure the onions and then hold them under optimum conditions using optimum flow rate of air having the proper temperature and humidity.

Storage

Temperature of about 32° F and a relative humidity of 50-75 percent are optimum for long-



Modern bulk onion storage utilizes self-unloading bins and a fan system. Fans control moisture and temperature and help insure maximum storage life.

term storage. Common storage in a waterproof shed or barn is used extensively in Oregon. High humidity in storage causes root growth, thus air circulation is important. A common rule of thumb is to allow at least ten cubic feet of air per minute of forced ventilation per ton of onions. It is important that the air passes uniformly through the storage area. This is best accomplished by storing the onions on slatted boards or in tote bins with slatted bottoms. Bins can be made to hold 1,000-1,300 pounds. This type of storage is most suitable for hard onions such as Yellow Glove Danvers. Maleic Hydrazide (MH-30) has been effective as a sprout inhibitor. It is applied when 50 percent of the tops are down and tops are still green to all onions intended for long-term storage.

Long-term storage costs and weight loss of from 10-13 percent by dehydration must be considered against any possible increase in the price of onions during the storage period.

Marketing

Onions are usually sold through brokers or through chain stores directly. Aggressive activity and effort is imperative in marketing the fresh onion crop. Japan is becoming an increasingly important market for Oregon onions. Processing of onions and new product development are increasing in importance. French fried onion rings, chopped frozen onions, and dehydrated onions are becoming more commonplace in the kitchen. Onions also are being used more in processed specialty dishes, as well as the snack food industry.

Onions have a very inelastic demand and command high prices in the fresh market when stocks are low. Conversely, prices plummet when there is over-production.

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