DRIY PE A PRODUCTION
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The success of a crop of dry peas in eastern Washington depends upon many factors. Some of these factors, such as climate, cannot be controlled. But others can be controlled and need careful attention. These include seedbed preparation, fertilization, seeding, weeds, insects, and—to some extent—diseases. How and when one deals with these success factors is most important.

A fine, firm seedbed is necessary for peas. Cultivating or rod-weeding when too wet will compact the soil.

Fields to be used for peas should be plowed in the fall if possible. If not, plow early in the spring, just as soon as fields are dry enough to work. When heavy stubble must be plowed under in the spring, it is difficult to prepare a firm seedbed.

Finish the seedbed with a spring tooth harrow. Avoid deep cultivation. It causes too much moisture to evaporate from the soil.
Fertilizers are recommended to increase pea yields in eastern Washington.

Dry fertilizers and non-injected liquids should be applied early in seedbed preparation and worked into the soil.

Injected liquid and gas fertilizers should also be used early in seedbed preparation. Space injectors not more than 9 inches apart and operate at a depth of 3 to 6 inches.

Applications of sulfur (S), molybdenum (Mo), and phosphorus (P) are commonly made. The need for potassium (K) may be determined in unusual cases by soil test.

**Sulfur:** Sulfur is essential for maximum yields. Apply fertilizers to supply 10 to 15 pounds of sulfur per acre annually.

The fertilizer may be applied yearly, or every second or third crop year. Thirty to 45 pounds per acre are needed if used every second or third year.

**Molybdenum:** Molybdenum fertilizers are recommended for pea crops on Athena, Palouse, Couse, and Thatuna soils only. The application is conveniently done as a seed treatment.

For Athena soils, apply ¼ ounce sodium molybdate to the seed per acre.

For Palouse, Couse, Thatuna, and associated soils, use ½ ounce per acre.

The fertilizer should cover the seed completely. To assure this, apply with a “sticker.”

**Phosphorus:** Severely eroded and depleted soils respond to phosphorus fertilizers. The amount to apply should be based on soil tests.

If the Washington State University soil test is Very Low or Low, apply 40 pounds of P₂O₅ per acre. Phosphorus fertilizer is not recommended for soils testing Medium or High. Best results will be obtained by either plowing down this fertilizer the previous fall, or drilling it into the soil before spring planting.
Potassium: Again soil tests indicate the need for this nutrient.

Soils testing Very Low or Low need 40 pounds of K₂O per acre. No potassium fertilizer is recommended if the soil test is Medium or High.

Nitrogen is necessary for pea growth but generally need not be applied. Most of the nitrogen for the plant is fixed by the Rhizobia bacteria in the root nodules. These nitrogen-fixing bacteria must first be present in the soil or on the seed before the plant will nodulate.

Seeding

Use the best seed available. Use seed inoculated with a Rhizobia culture for the first crop of peas on a field. Do the same on fields that are not known to have produced well-nodulated peas during the last four or more years.

Peas develop during cool weather. They should be sown as early in the spring as the seedbed can be prepared. Early seeded peas develop before the heat of early summer can harm them and usually produce higher yields.

The proper seeding rate means a greater opportunity for high yields. In eastern Washington allow about 16 square inches of ground for each plant.

Of course, not all seeds will produce a plant. A germination test will show how many seeds are viable. Only about 75 per cent of the viable seeds will produce a plant.

A seeding rate that will give one seed every 2 inches in 7-inch drill rows is a minimum.

To check the seeding rate for each seed lot, drill the seed on the surface for a short distance. Count the peas dropped in two or more rows over a distance of at least 3 feet.

Peas should be seeded 2½ to 3 inches deep. After the seed is planted, roll the soil immediately to firm the seedbed and aid germination.
Wild oats and other grassy weeds often infest dry pea fields. They can be controlled by treatment before planting or after emergence of the plants.

**IPC:** Apply as a pre-planting treatment at the rate of 4.0 pounds of active ingredient per acre. Apply not more than 10 days before planting and disk into the top 4 to 6 inches of soil. IPC may be applied as a wettable powder in 10 to 40 gallons of water per acre or as an IPC-gypsum mixture.

**Avadex:** Use as a pre-planting treatment. Apply as a spray at 1 1/4 to 1 1/2 pounds of active ingredient per acre. Use 1 1/4 pounds with small seeded varieties.

Use immediately before planting and thoroughly mix with the top 1 to 2 inches of soil.

**Barban (Carbyne):** Apply as a foliage spray when the wild oats are in the two-leaf stage (4 to 9 days after emergence) and the peas have less than six leaves (10 days after emergence).

Use 1/3 pound active ingredient in 5 to 10 gallons of water per acre. Do not allow livestock to graze on the stubble (lower 3 inches of stem) of treated peas.

Dry pea growers in eastern Washington are mainly concerned with controlling the pea aphid and the pea weevil. Recently the pea leaf weevil has been found in the Columbia Basin area and may spread to other pea-growing areas of eastern Washington.

**Pea Aphid**

The adult pea aphid is small—about 3/16 inch long—light green, and long legged. The insect may be wingless or have prominent, nearly transparent wings.
The aphid overwinters as an egg attached to the stems or leaves of alfalfa or clover. In early spring the eggs hatch. The young aphids feed on the newly sprouted alfalfa or clover plants.

During April and May, depending on weather and host plant conditions, the insects develop wings and fly, with the aid of wind currents, to the pea fields.

The pea aphid weakens the plant directly by sucking its sap. Indirectly, the aphid is harmful for the virus diseases it transmits.

Use an insect-collecting net to measure aphid infestation. Make half-circle sweeps with a net about 15 inches in diameter, in five representative parts of the field. The stroke should be heavy enough to knock a large number of the aphids into the net. It should not be so heavy as to injure the plants.

Count the aphids collected in each sweep. If 30 to 40 are collected in one sweep, or if one aphid per plant is found on plants too small to sweep, apply an insecticide at once.

The insecticides used for pea aphid control include parathion, metacide, malathion, TEPP, Systox, and Di-syston. Because of its safety, malathion is preferred where fields are close to town or residences.

Malathion: Apply as a spray using either wettable powder or emulsifiable concentrate. Use 16 to 18 ounces of actual ingredient in 6 to 10 gallons of water per acre. Do not apply within 3 days of harvest. Do not apply within 7 days of harvest if forage is to be fed to livestock.

Parathion and metacide: Apply either chemical as a spray using 0.4 pounds of actual ingredient in 6 to 10 gallons of water per acre. Use the wettable powder or emulsifiable concentrate. The same amount of parathion applied as a 1 per cent dust is acceptable. Do not apply these chemicals within 15 days of harvest.

TEPP: Apply TEPP at the rate of 1 pint of 40 per cent concentrate in 6 to 10 gallons of water per
acre. Do not apply within 3 days of harvest. A 7-day interval between last application and feeding is required if vines are to be fed to livestock.

**Systox:** Apply as a spray using 1 pint of the emulsifiable concentrate in 6 to 10 gallons of water per acre. Do not apply Systox within 21 days of harvest.

**Di-syston:** Apply 10 pounds of the 10 per cent granules by drilling alongside the seed or by broadcasting at planting time only.

**Pea Weevil**

The adult pea weevil is a brownish colored insect flecked with white, black, and gray patches. It is about 1/5 inch long.

The weevil develops within the pea seed from eggs deposited on the green pod. It emerges late in the summer or fall, and spends the winter in and about buildings, in crevices of fence posts, in the bark of trees, and in field rubbish. In harvested peas, the weevil may remain in hibernation within the container of the seed, escaping when the seed is removed for planting or processing.

During the first warm days of spring, about the time the earliest peas begin to bloom, the weevils break their hibernation, move to the pea fields, and feed on the pollen of the blossoming peas.

Sweep the field with an insect-collecting net soon after the first blossoms appear. Pay particular attention to the borders and low areas of the field.

If any weevils are found, control measures should start immediately, before any pods have formed.

Pea weevils may be controlled with DDT, methoxychlor, rotenone, parathion, metacide, or malathion.

Several applications of insecticide are usually required. Weevils entering the field 4 or 5 days after treatment will not be killed by the insecticide residue left.

**DDT:** Apply 20 pounds of 5 per cent dust per acre at blossoming time. Treated vines *must not be fed* to dairy animals or livestock being finished for
slaughter. Do not apply DDT to pea varieties with edible pods after the pods begin to form.

*Methoxychlor:* Apply 20 pounds of 5 per cent methoxychlor dust per acre. This insecticide may be used on vines that are to be fed to dairy animals or to livestock being finished for slaughter. But do not apply within 7 days of harvest.

*Rotenone:* Apply 20 pounds of 0.75 per cent rotenone dust per acre. This may be used on vines fed to dairy animals or to livestock being finished for slaughter. Do not apply rotenone within 1 day of harvest.

*Parathion, metacide, and malathion:* These chemicals give good weevil control when applied during bloom before pods have formed. Apply as recommended for aphid control.

**Pea Leaf Weevil**

The adult insect is slender, grayish brown, and about 3/16 inch long. It has large inner wings and is a strong flier.

Pea leaf weevils overwinter in vegetative litter and move to leguminous crops in the spring.

Larvae, hatched from eggs scattered mostly on the ground, penetrate the soil until they hit a root nodule. As the larva grows it eats its way into the nodule.

When full grown (about 35 days), the larva leaves the nodule and forms a cell in the upper 2 or 3 inches of soil. There it pupates. The adult emerges after about 15 days (in June or July) and begins feeding.

The insect eats the plant leaves and causes them to appear scalloped along the edge. The damage potential of this insect in eastern Washington is not yet known; however, in other areas heavy infestations have been known to completely defoliate a crop.

If control measures are required, use DDT or methoxychlor as for weevil control. Vines treated with DDT must not be fed to dairy animals or livestock being finished for slaughter.
Some of the major diseases of peas in eastern Washington are root rot, wilt, powdery mildew, pea streak, and pea enation.

**Root Rot**

Root rot is the most destructive disease of peas in eastern Washington. This disease can be caused by any of several soil-inhabiting fungi which destroy tissues in the stem and root, eventually killing the plant.

Early symptoms of root rot include a discolored stem at the point of seed attachment and a darkened stem at or below the ground level.

Since the root rot fungi live in the soil, they are not easily controlled. The severity of the disease may be reduced by means of crop rotation. Fields with a high amount of root rot should not be re-planted to peas for 4 to 6 years.

In general, any cultural practices which favor both plant emergence and strength will reduce the damaging effect of root rot. These include proper seeding, fertilization, and weed control.

Treating seed with effective fungicides such as Captan, Arasan, Spergon, or Phygon delays fungus invasion of the root system. **Do not use treated seed as food or feed.**

**Captan:** Apply 1.2 ounces of actual ingredient as a dust or 1.8 ounces of actual ingredient as a slurry for each 100 pounds of seed.

**Arasan:** Apply up to 1.7 ounces actual ingredient as a dust or 1.5 ounces actual ingredient as a slurry per 100 pounds of seed.

**Spergon:** Apply 6 ounces actual ingredient per 100 pounds of seed.

**Phygon:** Apply up to 1.0 ounce actual ingredient as a dust or slurry per 100 pounds of seed.

**Wilt and Near-Wilt**

Wilt and near-wilt are similar diseases caused by two races of the same fungus. The conductive
tissues of the root and stem are invaded. Infected plants are stunted and have yellow foliage. If either disease is severe, a distinct wilting may occur.

Near-wilt more closely resembles root rot. It causes the stem to be a brick red color and plants may die prematurely.

Some of the common processing varieties such as Resistant Alaska, Thomas Laxton 251, Wisconsin Perfection, Wisconsin Early Sweet, and others are resistant to wilt but not to near-wilt. Delwiche Commando is reported to be resistant to both diseases. New Wales, New Season, and New Era are canning varieties also resistant to both wilt and near-wilt.

The use of resistant varieties is the only practical means of controlling wilt, but crop rotation may help to prevent a rapid build-up of the wilt fungi in the soil.

**Powdery Mildew**

This disease causes a white or gray powdery coating over the leaf and small brown spots or streaks on the pods. It may be controlled by dusting with sulfur at rates up to 50 pounds per acre.

**Downy Mildew**

Downy mildew causes a water-soaked appearance with a cottonlike coating on the undersides of the leaves and inside the pods. Usually, no control measures are needed, but in extreme cases, 5 pounds of basic copper sulfate in 50 gallons of water per acre will help to control this disease.

**Pea Streak**

Pea streak is a virus disease, but the carrier of the virus has not yet been definitely determined. Aphids are believed to be the carrier but the pea aphid is reported to be an inefficient carrier. Forage legumes, including alfalfa and red clover, may be sources of the virus.

The disease is characterized by brown to purple streaks scattered along the stems and leafstalks. Plants infected shortly after emergence may die.

A definite method of controlling pea streak is
not known. Because the virus may be carried in forage legumes, it is advisable to avoid planting peas in fields that are adjacent to these crops.

**Pea Enation Mosaic**

Pea enation mosaic is a virus disease transmitted by several different aphids. The virus may also be carried in a number of forage legumes. It is rarely or never carried in the seed.

Terminal leaves of infected plants have a pale yellow mottling. Plants may be stunted and leaves distorted.

An effective aphid control program and not planting peas near fields of forage legumes are the best means of controlling this disease.
PESTICIDE RECOMMENDATIONS

Recommendations for the use of certain pesticides are subject to frequent change because of new research on their use and new regulatory requirements. Check with your county Extension agent or Washington State University for current pesticide recommendations.