PRODUCTION OF SMOOTH DRY EDIBLE PEAS

Extension Circular 426

C.E. Otis, R.E. Rieder and Clyde Walker
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Close upon the heels of the declaration of war in December 1941 came a realization of the importance of certain food crops. Among these commodities finding themselves suddenly treading in the limelight were smooth dry edible peas. Because of their high food value and their ease of handling, smooth drys became a number one war crop, of which increased quantities are requested by the government in order to supply our armed forces and our allies.

While Oregon had long grown Austrian winters, cannery peas, and seed stock, the smooth dry edible varieties were a new crop, commercially, and presented many problems. In spite of this, 53.6 million pounds were produced on 37,200 acres in 1943, as compared with a quarter million pounds from 200 acres in 1941.

The importance of peas was again stressed when 75,000 acres was established as a 1944 production goal for Oregon farmers. If this mark is to be reached, the crop will move into new areas and be grown by producers with little or no experience. This bulletin has been prepared particularly for such growers, but others may find it useful also.

WHERE TO PLANT

Cool growing weather is necessary. While the dry edible pea plant can withstand light frosts in the spring, high temperatures reduce yields, particularly when occurring at blossom time and while the pods are setting. For this reason dry pea production will not normally be profitable in such areas as Douglas, Josephine, and Jackson counties.

Moisture is usually considered of secondary importance to temperature. Although abundant rainfall is desirable, a successful crop may be grown if the soil moisture content is high at planting time and if occasional intermittent showers occur during the growing season. Production becomes risky in the low rainfall non-irrigated regions of eastern Oregon if the soil moisture supply is low in the spring. This applies particularly to the dry land areas of eastern Oregon having less than an average annual precipitation of 13 inches. For example, the long-time average yield per acre of white Canada peas at Union is 2,226 pounds, while at Moro it is 786 pounds. In high moisture years both areas yield profitable pea crops, while in low moisture seasons wheat is a more dependable producer at Moro. Peas nearly always return satisfactory yields in Union and eastern Umatilla counties. Moisture supply in the Willamette Valley is usually adequate for pea production, but weevil, aphid, and weeds are other hazards that tend to reduce returns.

\[1\]From Oregon Branch Experiment Station reports.
A well-drained, fertile loam makes the most desirable soil for peas, and will, in almost all cases, out-produce the wet, heavy, or sandy soils.

Peas are poor weed competitors. It is, therefore, highly important that clean, weed-free land be selected.

Edible peas should not be grown in fields that grew Austrian winters or peas of other classes the preceding year. The danger of producing inseparable mixtures is too great.

**WHAT TO PLANT**

Although there are many varieties of smooth edible peas, White Canada, Alaska, and First and Best are recommended. They receive government price support. Seed supplies are available. Sizable acreages of each have been grown in various parts of Oregon, and the introduction of new varieties increases the danger of mixture, and a lowering of grade. Yield trials at Oregon Agricultural Experiment Stations emphasize the superiority of the three varieties named.

Plots grown at the Pendleton Branch Experiment Station\(^1\) during the years 1930 to 1943 rank five varieties as follows:

<table>
<thead>
<tr>
<th>Variety</th>
<th>Yield in Percentage of Alaska</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>100</td>
</tr>
<tr>
<td>O'Rourke (not eligible for government purchase)</td>
<td>120.4</td>
</tr>
<tr>
<td>First and Best</td>
<td>104.7</td>
</tr>
<tr>
<td>White Canada</td>
<td>106.9</td>
</tr>
<tr>
<td>Perfection (Wrinkled)</td>
<td>102.4</td>
</tr>
</tbody>
</table>

Including three years of low yield because of poor inoculation, the 14-year average yield per acre for Alaskas was 1,435 pounds.

According to D. E. Richards\(^2\), the 12-year average yield per acre of White Canada peas at Union is 2,226 pounds. Although it is recognized that 1 year's results are not conclusive, the 1943 yields, when Alaskas, First and Best, and Narrowfat were grown for the first time, were:

<table>
<thead>
<tr>
<th>Variety</th>
<th>Yield, Pounds per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>2,839</td>
</tr>
<tr>
<td>First and Best</td>
<td>2,373</td>
</tr>
<tr>
<td>White Canada</td>
<td>2,331</td>
</tr>
<tr>
<td>Narrowfat</td>
<td>2,028</td>
</tr>
</tbody>
</table>

With an average yield per acre of 852 pounds over a 21-year period, O'Rourke leads all other smooth pea varieties at the Sherman Branch Experiment Station\(^3\). This variety is not, however, eligible for government purchase. During the same period White Canadas averaged 786 pounds per acre. Other varieties gave lower yields.

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\(^1\)As reported by G. A. Mitchell, Superintendent, Pendleton.

\(^2\)Superintendent, Eastern Oregon Branch Experiment Station, Union.

\(^3\)Figures from M. M. Oveson, Superintendent, Moro.
In years of short moisture supply, the Alaska variety, in spite of its earlier maturity, has not out-yielded White Canada at Moro or either White Canada or First and Best at the Pendleton Station. According to observations made by Oveson and Mitchell, the latter two varieties make more vine growth, which facilitates harvesting.

Here is a brief tabulation of varietal characteristics:

<table>
<thead>
<tr>
<th>Variety</th>
<th>Approximate No. of Seeds Per Pound</th>
<th>Color of Seed</th>
<th>Color of Blossom</th>
<th>Time of Maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Canada</td>
<td>3,000</td>
<td>Cream</td>
<td>White</td>
<td>Late</td>
</tr>
<tr>
<td>First and Best</td>
<td>2,000</td>
<td>White to Cream</td>
<td>White</td>
<td>Early</td>
</tr>
<tr>
<td>Alaska</td>
<td>2,600</td>
<td>Greenish Blue</td>
<td>White</td>
<td>Very Early</td>
</tr>
</tbody>
</table>

High quality planting stock pays dividends. Strains differ markedly in uniformity, vine height, earliness, vigor, and other factors. In the Alaska variety seed developed for cannery purposes is also the best to plant when growing dry edibles. When a good strain is found, part of the field should be set aside for seed production and the off types rogued out.

Lots containing mixtures should be avoided. Edible peas are sold on the basis of U.S. grades. Those grades, listed below, emphasize the importance of mixture-free seed.

(These requirements apply to re-cleaned and/or processed peas)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Maximum limits of</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bleached and other classes</td>
</tr>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td>U.S. No. 1</td>
<td>1.5</td>
</tr>
<tr>
<td>U.S. No. 2</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Of course, seed with high purity and germination is essential to produce a good stand of clean peas.

**SEEDBED PREPARATION**

A fairly deep, pulverized, and reasonably firm seedbed is required. More seedbed preparation is necessary for peas than for spring wheat. Because of the necessity of early spring seeding, the land should be fall plowed, if possible, and left rough, except in western Oregon where high winter rainfall leaches fertility on fall-plowed ground and except in wind erosion areas of eastern Oregon. Harrowing the plowed land in the spring, as soon as it is sufficiently dry, with a desk or spring tooth harrow, followed by a drag or spike tooth harrow, will usually put the seedbed in satisfactory shape. On weedy ground it is advisable to work the seedbed down early and follow with a spike tooth after the weed seeds have germinated.
Where spring plowing is necessary, it should be done as early as the soil condition will permit. Plowing under a heavy stubble in the spring may result in a poor seedbed and in damage to the pea crop.

INOCULATION AND SEED TREATMENT

Seed inoculation is cheap insurance, although where peas follow well-inoculated crops of peas or vetch many operators do not inoculate the second year. On new ground inoculation is a must. If the nitrifying bacteria are not in the soil, and available soil nitrogen is not present in sufficient quantity to supply the plant needs, yields may be cut 50 percent or more. Commercial inoculation cultures have generally proved satisfactory. Cultures may also be obtained from the Bacteriology Department, Oregon State College, through county agricultural agents.

The treatment of seed with a fungicide is a debatable question. G. A. Mitchell\(^1\) observes that at Pendleton seed treatment has no particular value on smooth-seeded peas, and, in fact, all fungicides tried, except Spergon, may have impaired inoculation when the seed treatment and inoculation culture were applied at the same time. He adds, by way of explanation, that soil molds and pea seedling troubles on the smooth peas have never been a serious problem on his station.

Where molds and seedling troubles are a problem, and the ground is inoculated from a preceding year’s pea or vetch crop, seed treatment is advisable. This is particularly applicable in western Oregon with its wet, cold springs. Workers in the state of Washington\(^2\) recommend New Improved Ceresan at 1 ounce per bushel or Spergon at 2 ounces per bushel.

When it is necessary to inoculate the seed for new ground, preliminary trials indicate that seed treatment with Spergon will not seriously injure legume inoculant. Instead of treating seed many operators resort to heavier seeding rates to take care of seed rots and seedling troubles.

FERTILIZERS

It is probable that applications of gypsum (landplaster) at the rate of 50 to 100 pounds per acre at seeding time will increase yields, although experimental evidence is lacking for the state as a whole. In most sections of Oregon, sulfur (gypsum is a sulfur carrier) has produced beneficial results when applied to legumes.

Washington\(^2\) has this to say about the use of nitrogen, phosphorus, and potassium in the Palouse country: "As previously shown, nitrogen is acquired by means of nitrogen-fixing bacteria. While a nitrogenous fertilizer may promote growth during the early development of the plant, it may not always prove beneficial. Plants making excessive growth need more moisture to complete their development than normal plants. Large growth, induced by the application of nitrogen fertilizer, may actually cause burning and reduce the yield if the seedlings are not properly established.

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\(^1\)Superintendent, Pendleton Branch Experiment Station.
crop is subjected to drought or dry winds as it approaches maturity. The possible benefit of a nitrogen fertilizer would not seem to be worth the cost. Fertilizers containing phosphorus and potassium are not thought to be sufficiently helpful to warrant their use."

However, this statement need not necessarily hold true for irrigated lands or for western Oregon where average spring precipitation is greater than in eastern Oregon and the Palouse area. In fact, a light application of nitrogen fertilizer may be just what the doctor ordered for two reasons:

1. To give the peas a quick jump on weeds, and
2. To provide a nitrogen supply adequate for early growth while nitrifying bacteria are still inactive due to cold, wet soil conditions.

Barnyard manure will increase yields in western Oregon and on irrigated or sub-irrigated lands east of the Cascades.

**SEEDING**

**When to seed.**

Peas should be planted as early as it is practicable to get on the ground. This crop can withstand light frosts early in the season, while high temperatures at blossom time almost invariably lower yields. George Mitchell, Superintendent of the Pendleton Branch Experiment Station, has observed cases where frosty back caused much tillering, resulting in more peas at harvest time than probably would have been obtained otherwise.

Date of seeding trials at Moro1 show that March 16 plantings have given the highest average yields, followed by April 9 seedings. Earlier or later dates showed considerably less yields.

Klages2 says that "Over a period of 3 years, peas seeded on the University Farm each year as soon as the ground could be worked averaged 36.0 bushels per acre. Those seeded 2 weeks later gave a yield of 28.6 bushels, while the plots seeded 4 weeks after the earliest planting yielded only 20.1 bushels per acre."

Weedy land, however, should be planted a little later in order to allow time for the weed seeds to germinate and be cultivated out.

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1 From reports submitted by M. M. Oveson, Superintendent, Sherman Branch Experiment Station.
2 Klages, K. H. W., Field Pea Production, University of Idaho, College of Agriculture, War Circular No. 7.
How much to seed.

Approximate Rates of Seeding Recommended for Oregon (Solid Seeding)*

<table>
<thead>
<tr>
<th>Area</th>
<th>White Canada</th>
<th>Alaska</th>
<th>First and Best</th>
</tr>
</thead>
<tbody>
<tr>
<td>Umatilla (higher rainfall portion) and Blue Mountain counties</td>
<td>105</td>
<td>125</td>
<td>160</td>
</tr>
<tr>
<td>Lower rainfall section of Columbia wheat belt</td>
<td>75</td>
<td>85</td>
<td>110</td>
</tr>
<tr>
<td>Western Oregon and all irrigated land</td>
<td>120</td>
<td>140</td>
<td>180</td>
</tr>
</tbody>
</table>

*Seed somewhat heavier on weedy land to provide competition.
*If row seedings are used in the lower rainfall sections, less seed will be needed.
#Rates are based on number of seeds per pound as given earlier in this bulletin.

Idaho\(^1\) reports that four to five plants per square foot produce the highest yield regardless of variety and that six to seven seeds, weevil-free and carefully graded, must be delivered per square foot to produce optimum stands. These figures have been adjusted and correlated with Oregon results to reach the preceding recommendations. Rates for western Oregon are rather high to compensate for the seed rot that often occurs during the common cold, wet springs.

Before beginning the main seeding job, it is always well to drill out a measured amount of seed over a given area to determine the accuracy of the drill calibrations. Peas weigh 60 pounds to the bushel and 15 per peck.

How to seed.

Drilling is preferable to broadcasting because the seed is then scattered over the field evenly and at a uniform depth.

Row seeding is sometimes practiced in low rainfall areas. The usual method is to seed in double rows six or seven inches apart with a 36-inch spacing between the double rows. Advantages are moisture conservation, less weeds, and more vine growth, which facilitates harvesting. Disadvantages are:

1. Cultivation is necessary which adds to the expense.
2. Harvesting is more difficult following cultivation.

Farmers in Wasco, Sherman, Gilliam, Morrow, and parts of Umatilla counties may find the double-row method the best in years of low rainfall or when the preceding winter has been dry.

\(^1\)Hulbert, H. W. and Burkhart, F. L., Rate of Seeding for Peas, University of Idaho Agricultural Experiment Station, Bulletin No. 181, June 1931.
The preferred seeding depth is 2½ to 3½ inches, with the usual at two and a half or three. On heavy soils seed shallow, and on sandy soils seed deep. The objective here is to place the seed in a firm, moist seedbed that will insure prompt germination and a good stand.

Many operators follow the drill with a roller or cultipacker, either with a tandem hook-up or in a separate operation. This firms the soil around the seed and smooths the surface which makes for the best harvesting conditions. This packing is normally not required on early-seeded peas in western Oregon.

**WEEVIL CONTROL**

It is highly important that seed and food peas be given maximum protection from weevil damage during the coming season. Pea weevils may be controlled by timely applications of a dust insecticide.

The pea weevil lays its eggs on the green pea pods. The only known satisfactory method of controlling the pest is by preventing this egg deposition. This is done by thorough dust insecticide applications on the pea vines to kill the adult weevils before the eggs are laid.

**Method for Determining Pea Weevil Infestation.**

It is generally recommended that a sweep net survey be made of each field to determine the infestation and to determine the part of each field to be marked off for dusting. The average number of weevils collected in 25 field sweeps is generally employed in determining the infested areas. However, fields of 10 acres or less in the Willamette Valley will likely require dusting of the entire field.

Accurate results may be obtained by the following procedure in sweeping:

1. In sweeping, grasp the net firmly and walk through the peas parallel to the edge of the field, taking one stroke with each step. A series of four 25-sweep samples is usually considered adequate. After the first series of sweeps at the edge of the field, move into the field from 50 to 100 feet, and make another series of counts. Repeat this process until you find no more weevil, or until you reach the center of the field. This is done to determine the actual infested area which will require dusting.

2. The net should be swung vigorously through the vines and not above them. The net should swing hard enough to take off from 3 to 5 tips in 25 sweeps.

**Making a Sweeping Net.**

1. Bend 5 feet of heavy, stiff wire (barrel-hoop or #9 wire) into the shape illustrated.
2. Bore hole and cut grooves in a 3-foot wooden handle (broom handle) so that the base of the wire hoop will fit flush with the outer surface of the handle.

3. Cut a piece of cloth 24 by 50 inches (mosquito netting or better grade material) to the pattern illustrated. Fold a 2-inch wide strip of heavy muslin and sew it to the curved surface of the cut netting. Sew the bag up to, but not including, the muslin strip.

4. Slip the wire through the folded muslin strip and fasten to the handle by wrapping with cord or light wire.

5. For additional details, consult U.S. Department of Agriculture Farmers' Bulletin 1601, "Collection and Preservation of Insects."

Time of Dust Applications.

Timing of dust applications is of primary importance in pea weevil control. One or two dust applications may be required to control the pea weevil on dry edible peas. Growers will be notified through the Extension Service when the peak movement of the weevil occurs, and the first application should be made then. If substantial flights of weevil occur after the first dusting, a second dust application would probably be of value. Growers should check their fields a week or 10 days after dusting, and if populations have built up to one weevil per 25 sweeps the field should receive a second application.

Dry edible peas, to be graded as No. 1 or No. 2, must show less than 0.5% and 1% weevily peas, respectively. Dusting alone is not expected to give this degree of control in most cases. In order to eliminate the remaining weevily peas, it is necessary to allow the weevils to complete their development before cleaning. This procedure insures the weevily peas being light enough to be cleaned out effectively. Hence, such varieties should be allowed to fully mature before harvest, and should be held thereafter for a period of a month or more before fumigation and cleaning.

Insecticidal Dusts.

A dust containing \( \frac{3}{4} \) of 1% rotenone (\( .75\% \)) is the recommended insecticide for combating the pea weevil. Dust applications should be made under favorable conditions, i.e., in settled weather when the temperature will reach 70\(^\circ\) F. sometime within 24 hours following the treatment. Dusting should not be done in
wind of more than 12 miles per hour. Since rotenone supplies are limited, only those areas in each field that are infested should be dusted. The dust should be used at the rate of 20 pounds per acre.

Equipment.

Dusting equipment necessary will depend upon the area to be treated. Power dusters mounted on trucks, trailers, or tractors, and equipped with hoods or canvas drags, covering a swath 25 to 45 feet wide should be used on the large field plantings.

For further information on pea weevil control, see Oregon Agricultural Experiment Station Circular 126; and for details of duster construction, see Circular of Information 262.

HARVESTING

Methods of Harvesting.

Methods of harvesting smooth dry peas include (1) direct combining; (2) mowing, and combining from the swath or windrow; and (3) mowing, bunching, and hauling to a stationary thresher.

Regardless of the harvesting method used, a number of the peas will be lost by shattering. Losses up to 10 percent or more are almost unavoidable. While it is desirable to handle the peas in a way that will cut shattering losses to a minimum, the grower need not feel unduly concerned if he sees a considerable number of peas on the ground after harvest. Many of these can be saved by turning hogs into the field, if available.

Direct combining of smooth dry edible peas is the method preferred by most growers when circumstances permit, as it requires only one operation over the field. For successful direct combining the peas must be uniformly ripe and reasonably free from weeds.

When direct combining, the use of a special pea cutter bar and reel is desirable. The pea cutter bar is so constructed that it floats on the ground, being flexibly connected to the combine header platform. A space between the bar and platform permits rocks and clods to escape without being transported upward onto the platform canvas. The flexible connection of the bar also permits it to cut much more closely to the ground than would otherwise be possible. The special pea reel has spring wire fingers on the bats, which are operated by an eccentric connection in such a manner as to cause the fingers to remain in a near vertical position as the reel revolves. This enables them to enter the pea vines on the ground, lift them upward toward the platform and then release them without excessive wrapping.

Small "straight through" combines in the 5' and 6' sizes can do a reasonably good job without the special cutter bar, but should have the combination bat and tined pickup reel. Larger combines need both the special bar and reel for best results.
Special reels and cutter bars of this type are manufactured in the Pacific Northwest. Consult your county agent for further information.

**Mowing and combining.** Mowing the peas before combining permits starting
the harvest earlier than can be done if the peas are allowed to ripen enough
for direct combining. Mowing is also resorted to when an excessive growth of
weeds in the peas makes it inadvisable to harvest them by direct combining.

When peas are mowed, probably the most common practice is to windrow them
with a windrower attached to the mower cutter bar, which rolls the swath completely
out of the path followed by the tractor on the next round. This method of wind-
rowing is quite satisfactory except that the windrows are rather easily moved by
wind.

One practice which helps to eliminate difficulty due to windrows being
blown about or bunched by wind is to mow the peas with a tractor-mounted mower,
extending the wheels on the tractor to a width corresponding to the length of
the cutter bar. The divider board on the outer end of the cutter bar is adjusted
to turn the edge of the swath over enough to provide clearance for the tractor
wheels as the tractor straddles the swath on the following round. Thus the
major part of the swath lies flat in its natural position and the wind is less
likely to roll the windrowed vines into piles, as may occur when using the type
of windrower which rolls the swath completely over.

Another method of windrowing is the use of a tractor-mounted windrower
which cuts the pea vines, lifts them onto a platform canvas and deposits them
in a windrow at the side of the machine. Such windrowers are much like the
header platform of a large combine in construction and operation, and use the
same special pea cutter bar and reel equipment.

When the peas are combined from the windrow, regular cutter bars with
lifter guards, as commonly used for hairy vetch and similar crops, will ordinarily
prove adequate. The use of a revolving pick-up attachment is also generally
satisfactory. The special reel is recommended when combining either from the
swath or windrow, with both large and small machines.

**Mowing and threshing.** Growers who mow and swath or windrow their peas
and then haul to a stationary thresher claim that the crop can be harvested
sooner by this method than by combining, as the peas can be mowed, windrowed,
and bunched when still not ripe enough to combine. The peas can then be hauled
to a stationary thresher and threshed without delay due to heavy dew or light
showers, which would delay combining. The straw is also available as feed for
livestock, while weed seeds are not scattered over the field as much as when
the crop is combined. A recommended procedure when the peas are to be threshed
in a stationary thresher is to mow as green as permissible, using a windrower on
the mower. It is desirable to bunch them immediately after mowing. This may be
done as a separate operation, or in some cases it is done by attaching a dump
rake to a hitch extended to the left of the tractor on which the mower is
mounted, and bunching the peas as they are mowed.
Capacity of harvesting machines.

When estimating the acreage of peas that can be harvested with their combines, growers should consider the capacity of their machines to be about one-half as much as when harvesting wheat. In general, a 14- or 16-foot combine can harvest around 300 acres of peas during the season, though a favorable season may make it possible to double this figure. The capacity of 5- or 6-foot machines will be about half that of the larger combines.

Heavy dews or light showers will cause more delay in combining peas than wheat. Some growers report that they do well to average 6 hours of operation per day when combining peas. Many recommend having two combines; one equipped for wheat and the other for peas, the wheat combine for use on wheat in the forenoon and the pea combine for use on peas in the afternoon. The peas themselves are relatively easy to thresh, but the straw is hard to handle when damp and tough. In areas where conditions are more favorable the length of daily operation will more nearly approximate that possible with wheat, but as a rule the working day when threshing peas will be shorter than when harvesting wheat.

Threshing mechanism adjustments.

The grade requirements for U. S. No. 1 peas limit split peas to 0.5%, while cracked seed coats are limited to 3%. Split peas or peas with cracked seed coats are good only for feed; consequently such peas represent a considerable financial loss to the grower. Grain inspection records for the 1943 crop show that cracked peas were responsible for reducing the grade on samples more than any other grading factor. One report shows that 107 samples out of 386 were below No. 1 grade, and cracked peas were responsible for degrading 48 of the 107 samples. For these reasons it is important to have the threshing mechanism of the combine or thresher properly adjusted so as to hold the percentage of damaged peas to a minimum.

Cylinder speeds. One essential adjustment for threshing peas is to slow the cylinder down to about 400 revolutions per minute. Reports received during the 1943 season indicate that some varieties crack easier than others, necessitating a slower cylinder speed. For Alaska peas a cylinder speed of about 400 r.p.m. will generally be found satisfactory, while for First and Best and White Canadians the speed may have to be reduced below that figure. The exact speed required for best results will vary and will have to be changed from time to time to meet changing conditions. As a general rule, the cylinder speed for a combine should be reduced to half or less than half of the speed used for wheat. Further adjustments can then be made as conditions demand.

Concave adjustment. Machines using teeth on the cylinder and concaves should have most of them removed. Some recommend removing all of the cylinder teeth and replacing them with lengths of angle iron bolted to the cylinder. On a 28-inch cylinder from five to seven teeth are left in the concave bar. Some growers sharpen the front edge of the concave teeth, while others cut the tooth off near the hub, slit it and weld a mower knife section in the slit in such a way that the knife section will rest edgewise in the concave bar. This arrangement is especially helpful in cutting damp, tough straw so it will pass through the machine. Another practice is to replace metal concave bars with wooden bars.
On the rub-bar type of machine the clearance between the cylinder bars and concave is increased considerably over that required for threshing small grains. For the initial adjustment, follow the recommendations in the instruction book for each machine. Further adjustments will be determined by the results obtained.

Augers and elevators. Augers should either fit so close to the housing that peas cannot be cracked between the spiral and the housing, or sufficient space to clear the peas completely should be provided. Some growers rivet a strip of belting along the edge of the auger to give a tight fit between the auger and its housing.

Chain operated elevators are very likely to crack peas, and it is desirable to substitute belt and bucket elevators for the drag chain type wherever feasible. If this cannot be done, slowing down the drag chain may help decrease the number of damaged peas.

Pickers and beaters. Pickers above the straw racks will cause considerable trouble unless they are shielded or covered with sheet steel or wood. One practice is to use a board about one-half inch narrower than the length of the teeth, boring holes through the board edgewise to accommodate the picker teeth. Thus when the board is placed over the teeth, they project approximately one-half inch beyond it. Other operators cover the picker teeth with lengths of sheet steel folded so as to cover the teeth completely. Either method converts the picker into a beater, and reduces wrapping of the pea straw. Some new combines have as regular equipment removable shields for converting the pickers to beaters.

Screens and sieves. Screens and sieves must be of the proper size for peas. Punched steel screens are preferable to wire screens, as green weeds or vines have a greater tendency to hang up in wire screens.

Growers should contact their local implement dealer regarding the proper sieve and screen equipment for their combines, also making sure that they have the necessary pulley or chain and sprocket equipment for securing the required cylinder speed.