Southern Pea

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Scientific Name and Introduction

Southern pea, or cowpea, (*Vigna unguiculata* [L.] Walp.) is a native of Africa and is adapted to hot, dry climates. The southern pea is not actually a pea, and thus differs considerably from the green or English pea *(Pisum sativum)* (Peirce 1987). Prized in the southern United States, southern peas are rich in folic acid, fiber, and calcium. Peas are distinguished by pod color, pea color and pattern, and hilum color. Five groups of cultivars are recognized on the basis of seed and pod coloration and seed packing in pod. They include black-eyed ('California Blackeye No. 5'), cream ('Elite'), purplehull ('Pinkeye Purple Hull'), crowder ('Mississippi Silver'), and miscellaneous other colored, noncrowder peas ('Dixielee'). 'Bettersnap' was developed specifically for edible pods (Fery and Dukes 1995).

Quality Characteristics and Criteria

Some cultivars have edible pods (similar to green beans) and should be harvested when the pods are 10 to 16 cm (4 to 6 in) long, flexible, and dark green. Shelled peas should be a mature size, have smooth skin, and exhibit characteristic color.

Horticultural Maturity Indices

Fresh-market southern peas are harvested when the pods are at the mature-green stage (peas are fully developed and the majority of the pods have undergone a color change). It is acceptable to have some pods that have not undergone a complete color change (green with some purpling in the case of purplehulls) provided the peas are mature size. Shelled peas should be light green in color.

Pea color is affected both by maturity and cultivar. Tan or white peas are perceived to be too mature (except for cream types). Blackeye cultivars exhibit the most difficulty in determining when to harvest for fresh use because the color of the black hilum does not fully develop until peak maturity. The color will be purple to chocolate-brown if harvested early. If southern peas are to be harvested for edible pod use, they must be selected when quite young and tender—no more than half of the expected diameter of mature green pods—unless it is a cultivar specifically developed for edible pod use.

Grades, Sizes, and Packaging

USDA grades of southern peas are U.S. No. 1 (95% of pods must be at least 12.5 cm [5 in] long), and U.S. Commercial (no minimum length). Shelled peas are marketed in 4.5- to 5.4-kg (10- to

12-lb) plastic bags (considered the equivalent of a shelled bushel) or in 0.45-kg (1-lb) bags. Some large operations package peas in vacuum-packed 0.45- and 4.5-kg (1- and 10-lb) bags. No grades exist for southern peas used as snap beans. Fresh southern peas may also be sold in the hull by the bushel. A USDA bushel is 11.4 kg (25 lbs); however, at the local market level the bushel weight varies widely from region to region or from 7.3 to 13.6 kg (16 to 30 lbs). Pods for shelling are packed primarily in mesh bags (cabbage sacks) or wooden bushel baskets (becoming less common).

Precooling Conditions

In both shelled and unshelled states, peas are very prone to decay if held at room temperature. Unshelled peas are best cooled using a forced-air system. Contact with water greatly accelerates their deterioration. Shelled peas should be blown free of foreign material and then hydrocooled in a solution of 100 µL L^{-1} chlorine to remove heat quickly, preserve green color, and slow microbial growth. Peas to be trucked for processing are shelled into field bins where temperatures may reach 38 °C (100 °F) (Hardenburg et al. 1986). Peas start to yellow and decay after a few hours at 25 °C (77 °F). Flavor deterioration and off flavor in shelled peas may be a problem if they are held for as much as 7 h at 30 °C (86 °F) before processing.

Optimum Storage Conditions

Southern peas in the pod can be held for 6 to 8 days at 4 to 5 °C (39 to 41 °F) with 95% RH. Without refrigeration, they remain edible only about 2 days and show extensive decay in 4 to 6 days. Shelled peas should be held for no more than 24 to 48 h at 4 to 5 °C (39 to 41 °F) (Jenkins 1954).

Controlled Atmosphere (CA) Considerations

Effects of CA are unknown.

Retail Outlet Display Conditions

Peas should be kept under high RH and refrigerated to slow decay and color loss.

Chilling Sensitivity

Unknown. Southern peas are probably sensitive when held at 5 °C (41 °F) or below.

Ethylene Production and Sensitivity

Ethylene production rate is unknown. Southern peas are probably sensitive to ethylene with effects characterized by yellowing of pods.

Respiration Rates

Temperature	Whole pods	Shelled peas
	------mg CO_2 kg^{-1} h^{-1}--------	
2 °C	13 to 36	26 to 33
5 °C	16 to 33	-
20 °C	145 to 151	90 to 161

Data from P. Perkins-Veazie (unpublished) from pods 15 to 23 cm long of cultivars 'Excel,' 'BetterSnap,' 'Early Scarlet,' and 'Pinkeye Purple Hull BVR.'

Higher respiration values are for less mature (more green) peas and pods.

To get mL CO_2 kg^{-1} h^{-1}, divide the mg kg^{-1} h^{-1} rate by 2.0 at 0 °C (32 °F), 1.9 at 10 °C (50 °F), and 1.8 at 20 °C (68 °F). To calculate heat production, multiply mg kg^{-1} h^{-1} by 220 to get BTU per ton per day or by 61 to get kcal $tonne^{-1}$ day^{-1}.

Physiological Disorders

Brown spots, cracking, and seed-coat splitting are problems with pods and peas.

Postharvest Pathology

Very little research has been done on postharvest pathogens of southern pea. *Botrytis cinerea* (gray mold) can quickly develop on pods and shelled peas (Roland E. Roberts, Texas A&M, 2002, personal communication).

Quarantine Issues

There are no known quarantine issues.

Suitability as Fresh-Cut Product

Snap pea or yard-long cowpea cultivars, such as 'Bettersnap,' can be used as a fresh-cut product. These types must be harvested at the immature pod stage.

Special Considerations

Failure to precool shelled peas prior to packaging results in condensation in the bags and rapid souring and spoiling of the peas. Insect damage can create major postharvest grading problems due to feeding damage and misshaped peas caused by stinkbugs and due to the presence of punctures and larvae inside peas as a result of cowpea cucurlio.

References

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