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Home Storage of Apples

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Home storage of apples can provide convenient, ready access to fresh fruit for most of the winter. However, home apple storage is not as simple today as it used to be. Most newer homes, apartments and condominiums do not include locations suited to proper apple storage, making recurring purchase of small quantities of fruit from an orchard, roadside market, or grocery store a more feasible alternative. However, if home apple storage is desired, any home can, with some effort, provide the necessary conditions.

Apples are best stored at 30°- 32°F, with a relative humidity of 90 percent and some air circulation. These conditions provide the greatest delay in the normal ripening and aging process of the fruit.

Such conditions are necessary because an apple is not dead at the time of harvest. It remains a living, respiring organism and continues to take in oxygen and give off carbon dioxide and another gas, ethylene. Since the apple is no longer receiving nutrients from the tree but is still respiring, it must use up the food it has stored over the growing season. As this food is gradually used up during storage, the sugar, starch, and acid content of the apple changes. Eventually the tissues break down (a process enhanced by ethylene gas), water is lost, and the apple withers and decays. The low temperature, high humidity, and exchange of gases through air circulation serve to slow those natural events as much as possible.

Selecting Proper Fruit for Storage

Cultivars

Whether buying fruit or planting trees, the proper choice of cultivar (variety) is essential for long-term apple storage. Some cultivars are excellent keepers, while others have a short storage life even with good storage conditions. Table 1 lists apple cultivars recommended for Indiana. It gives a typical ripening date and an approximate storage life under good home conditions.

Fruit Quality

When harvesting home grown apples for storage, select only those fruit which have reached maturity but are not yet fully ripe. A mature apple is full-sized and has a sweet flavor. It should have a greenish-yellow undercolor and

be firm and crisp. Avoid over-ripe fruit which detaches too easily from the tree and which has a completely yellow undercolor, softened flesh, and a mellow flavor. Such fruit will break down rapidly in storage.

If purchasing fruit, buy only good quality fruit free of bruises, cuts, and decay. Ripeness should be as described above. However, consider purchasing less expensive fruit (utility grades) if you intend to use the stored fruit primarily for baking or processing. Remember to purchase only as much fruit for storage as you can realistically use during the storage period. For variety, consider storing more than one cultivar. Different cultivars have varying best uses, and Table 1 lists them for some popular Indiana cultivars.

Containers for Apple Storage

Small quantities of apples are best stored in plastic bags. The bags should have some holes or perforations for air circulation to avoid excess moisture build-up and allow gas exchange.

Large quantities of apples can be stored in crates or other containers if the overall storage environment is maintained at 90 percent relative humidity. The containers should be clean and have smooth inner surfaces. Protrusions such as staples or nails can cut or bruise fruit and cause early breakdown. Stackability is important for large quantity storage. Containers should stack so that air can circulate freely and so that the weight is borne by the container and not the fruit inside.

Storage Facilities

The most practical home storage device for apples is a refrigerator. Approximately 8/10 bushel of apples will fit in one cubic foot of space. However, only about 3/4 of that space should be filled with fruit; the other 1/4 volume should be left as air space for circulation. Use the available shelves so that air space is distributed around all the apples.

Relative humidity in refrigerators is quite low, particularly in "frost-free" types. It is therefore essential that apples be placed first in plastic bags as described above. Also, maintaining proper temperature is an important consideration. Optimum storage is 30°-32°F, but some refrigera-

tors tend to “drive down” the temperature if they are not opened over a period of time. In addition, the bottom of the refrigerator will tend to be colder than the top. A tiny fan placed in the refrigerator and run continuously will minimize this problem. Apples freeze at a temperature between 27.8° and 29.4°F, and frozen fruit deteriorates rapidly.

Apples can be kept satisfactorily in cellars that are humid and cool (below 40°F). They may also be stored in unheated outbuildings if properly insulated with hay or straw to prevent freezing. During those storage periods when daytime temperatures are well above 32°F but night temperatures fall below 32°F, ventilation of outbuildings

during hours of darkness can be beneficial. Vents near the ground and on the roof of the storage building are most efficient for the escape of warm air and its replacement by cooler night air.

Straw-lined pits and in-ground tiles have historically been used for apple storage. They function satisfactorily in some years and some areas. The convenience and efficiency of ready access to electricity and modern refrigeration, however, compared to the inconvenience and unreliability of pit storage, have made the earlier method obsolete.

Table 1. Home storage period and uses of popular Indiana apple cultivars. (Listed in approximate order of ripening).

Cultivar	Central Indiana Harvest Period	Storage Period (months)	Uses			
			Eating	Pies	Salads	Sauce
Yellow Transparent	July 10-July 20	1/4-1/2	—	G	—	—
Lodi	July 15-July 25	1/4-1/2	—	—	—	E
Redfree	Aug 5-Aug 20	2-3	E	—	E	G
Pristine	Aug 10-Aug 20	1/4-1/2	G	G	G	E
Paulared	Aug 15-Sept 1	1-3	G	G	G	G
Gala	Aug 20-Sept 10	1-3	E	G	E	G
Prima	Aug 25-Sept 5	1-2	E	E	G	F
McIntosh	Aug 30-Sept 15	2-4	E	G	G	G
Cortland	Sept 5-Sept 20	3-4	G	E	E	G
Spartan	Sept 5-Sept 25	3-4	E	G	G	G
Jonathon	Sept 5-Sept 25	2-3	E	E	G	F
Jonafree	Sept 5-Sept 25	2-3	E	E	G	F
Grimes	Sept 5-Sept 25	2-3	G	E	G	G
Priscilla	Sept 5-Sept 25	3-4	E	G	G	E
Red Delicious	Sept 10-Sept 30	3-4	E	—	E	—
Empire	Sept 10-Sept 25	3-4	E	E	E	G
Melrose	Sept 25-Oct 10	4-5	E	E	G	F
Fuji	Sept 25-Oct 10	4-5	E	G	E	G
Enterprise	Oct 1-Oct 20	3-4	G	G	G	G
Sir Prize	Oct 1-Oct 15	2-4	E	G	E	E
Golden Delicious	Oct 1-Oct 15	3-4	E	G	E	E
Idared	Oct 1-Oct 20	3-4	E	G	G	G
Northern Spy	Oct 1-Oct 20	4-5	F	G	G	G
Mutsu	Oct 5-Oct 20	4-5	E	G	E	—
Gold Rush	Oct 10 - Oct 30	1-3	E	E	E	—
Stayman	Oct 10-Oct 20	4-5	E	G	F	G
Turley	Oct 15-Oct 30	4-5	G	E	F	G
Winesap	Oct 15-Oct 30	4-5	E	G	F	G
Rome	Oct 15-Oct 30	4-5	F	E	F	G
Granny Smith	Oct 20-Nov 15	4-5	G	—	G	—

E= Excellent, G=Good, F=Fair, —=Not recommended.

For more information on the subject discussed in this publication, consult your local office of the Purdue University Cooperative Extension Service.