Sweet Potatoes

care required during storage between harvest and market

P. A. Minges and L. L. Morris

Sweet potato harvesting in California occurs mainly during October and early November. Much of the crop is marketed immediately resulting in relatively low prices during this period. During the winter and spring months, California becomes a deficit area and sweet potatoes are shipped in from other states. With good storage practices, sweet potatoes can be held for six months. Increased storage could permit larger California production and a more stable price structure.

Both temporary and overwinter storage are attempted in California. The results obtained are variable and need of improvement in practices is obvious. Last winter many growers suffered severe losses in storage. The unusually low winter temperatures together with poor structures and inadequate heating were important causes.

Successful storage depends on careful harvesting, selection of disease-free, high-grade potatoes, providing good storage conditions and avoiding the chilling of sweet potatoes either before or during storage. Tests conducted in Merced and San Joaquin counties during the past five years show that curing is very desirable for storage periods of over six weeks, especially with the Porto Rican and Hawaiian varieties.

Chilling Injury

Sweet potato roots may be injured by exposure to temperatures below 50° F either before or after harvesting. The time of exposure required to cause injury is shorter as the temperature lowers. Freshly dug or uncured potatoes are more sensitive to chilling than cured potatoes or those removed from storage. Potatoes injured by chilling are more subject to rotting and in storage may develop an unattractive color and surface depressions sometimes called *cold spotting*.

Injury from chilling may occur in the field after the soils have become cold and wet, and during or following periods of heavy frosts. There appear to be no toxic substances involved with frosted vines and it is not necessary to remove the frosted vines until the potatoes are to be dug. The important thing after a frost is to dig and move the potatoes to a warm place as soon as possible. Harvested potatoes definitely should not be left exposed in the field when night temperatures are dropping below 50° F.

Several days of exposure to chilling temperatures may be necessary to give definite injury symptoms but it is best to avoid all unnecessary exposure to temperatures below 50° F. Potatoes that have been subjected to chilling temperatures definitely should be cured at the start of the storage season.

Temporary Storage

Sweet potatoes for market may be held for four to six weeks in various shelters if temperatures are maintained above 50° F and the humidity is kept high. Curing may be of less value for such storage than for long storage. It is important to protect the potatoes from cold drafts and from the sun and rain.

In the San Joaquin Valley field piles are often used for temporary storage. From 250 to 500 pounds of potatoes are carefully stacked in piles about 2½ to three feet high. The piles are covered with wrapping paper and then sweet potato vines or straw are placed over the paper.

Sweet potatoes are not cured in field piles and their use is undesirable for potatoes going into regular storage. Chilling injury has been reported frequently when potatoes have been held in field piles too late in the fall.

Regular Storage

Only sound, disease free, marketable roots or good seed should be placed in storage. Unmarketable roots should be discarded in the field and badly bruised potatoes sorted out for immediate sale.

Potatoes harvested while the weather is still warm and before the fall rains begin are the most desirable for storage. It is advisable to move the potatoes directly to the storage house the day of harvest.

The potatoes may be stored in containers or in bulk bins.

The use of containers has several definite advantages over bin storage. There is less handling of the potatoes which eliminates some bruising; less labor is required in filling the storage; circulation of air around the potatoes is improved; and repacking for market is faster. Containers may require a little more space though this may be compensated by using higher stacks. Apple boxes, field crates or baskets are suitable. The containers should be filled level full as the potatoes are snapped and taken directly from the field to the storage.

The purpose of curing is to encourage the development of new skin or *periderm* at wounded surfaces. A good layer of skin over the entire surface of a sweet potato prevents excessive moisture loss and acts as a barrier against the invasion of storage diseases. At a temperature of 85° F and with the relative humidity above 85% the new skin layer forms in eight to ten days. At ordinary storage temperatures it forms very slowly if at all. Curing is not a drying process.

The curing process should begin as soon as possible after the potatoes are harvested. The storage house or compartment should be filled quickly, closed and the temperature raised to 85° F. Fans may be used to create air circulation to maintain uniform temperatures throughout the house. In order to maintain high humidity it is necessary for the house to be kept shut. Usually water should be sprinkled on the floor each day. Low humidity during curing results in excessive losses from shrinkage.

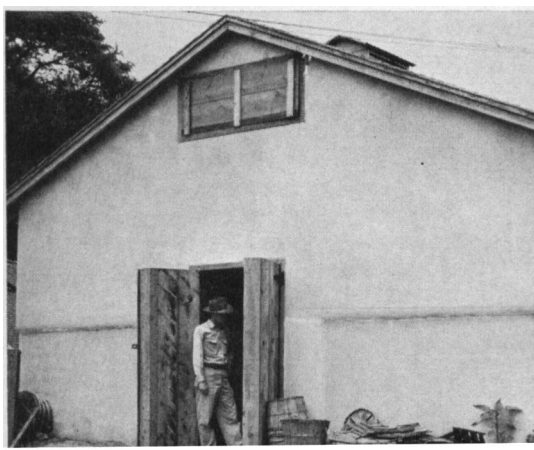
After eight to ten days the temperature should be lowered as rapidly as possible to 55° F. Holding temperatures at 85° F longer than 10 days or failure to cool the potatoes quickly results in excessive sprouting. To cool the house ventilate during the night and close it during the day.

Conditions for Storage

During the storage period a temperature of 55° F with a relative humidity of 80% to 85% is most desirable. Temperature above 60° F or below 50° F should be avoided. Cold drafts on the potatoes must be avoided. Condensation normally can be prevented by good insulation and proper circulation of air within the storage so potato or wall surfaces do not get cold. Ventilation is necessary only to prevent excessive condensation.

Continued on next page

A remodeled, heated, sweet potato storage house. The potatoes can be stored in containers and cured at the start of the storage period.



CELERY

Continued from page 13

acre are necessary to produce a good yield of high quality celery.

Six hundred pounds of nitrogen per acre resulted in slightly increased yields, but it is doubtful that applications exceeding this rate would be paid for in higher yields. The addition of large quantities of phosphorus and potash appear to be unnecessary on these soils.

The results of these tests indicate that celery growers in southern California could make a substantial saving in fertilizer costs.

Disease and Insects

Disease and insect control methods and costs also varied widely. Some growers used a combination of sprays and dusts in their pest control operations while others applied only sprays.

The number of applications ranged from five to 25, and costs were from $39.00 to $146.00 with an average for all of $75.00 per acre for labor and materials.

Close watch on disease and pest conditions by careful field examinations at frequent intervals, and the use of the most effective pest control materials should enable growers to keep these at a reasonably low figure.

The use of boom-type sprayers, which cover eight to ten rows at one time, can effectively reduce the labor cost of insect and disease control.

Irrigation

The amount of irrigation water used varied from 19½ to 104 inches and frequency of application ranged from 13 to 31 irrigations.

Soil types make a great difference in the amount of water needed to produce this shallow-rooted crop. Lighter soils could easily require several times as much water as some of the heavier silt and clay loams.

H. W. Schwalm is Associate Agriculturist in Agricultural Extension, Los Angeles County.

WHITE POTATOES

Continued from page 14

have shown that excessive amounts of water may lower grade, but such was not true of these experiments.

Irrigation affects the composition of potatoes. An insufficient amount of soil moisture causes an increase in the percentage of dry matter and of nitrogen in the tubers. Analyses of vegetables have shown that if growth is reduced because of a deficiency of some element, there is an increase in the other elements and usually in carbohydrates.

Irrigation treatment produced a noticeable effect on the appearance of the lenticels of the tubers. The nonirrigated potatoes have a normal, small appearing lenticel. The heavily irrigated potatoes exhibit a large, whitish tissue at the normal location for the lenticel.

John H. MacGillivray is Professor of Truck Crops and Olericulturist in the Experiment Station, Davis.

SWEET POTATOES

Continued from precedi..g page

Either above ground houses or cellars may be used. The important consideration for a storage house is to be able to maintain uniform desirable temperatures. The roof needs good insulation or a false ceiling should be provided to prevent condensation of moisture on the roof.

Provision for heat is necessary for curing and to prevent chilling during unusually cold periods.

It is advisable to divide large storages into compartments so the potatoes from a few days harvesting can be closed up and cured without delay.

Ventilators are essential for temperature and humidity control and should be arranged to avoid direct drafts on the potatoes. Storages should be rodent proof.

Windows should be covered to exclude light during the storage season.

P. A. Minges is Associate Agriculturist, Truck Crops, in Agricultural Extension, Davis.

L. L. Morris is Assistant Professor of Truck Crops and Assistant Olericulturist in the Experiment Station, Davis.

NEW PUBLICATIONS

—now ready for distribution—

Each month, new publications of the College of Agriculture are listed in this column as they are received from the press.

Single copies of these publications or a catalogue of Agricultural Publications may be obtained without charge from the local office of the Farm Advisor or by addressing a request to: Publications Office, 22 Giannini Hall, University of California, College of Agriculture, Berkeley 4, California.

CALIFORNIA GREENHOUSE PESTS AND THEIR CONTROL, by A. Earl Pritchard, Bul. 713, May, 1949.

A handbook for both professional and amateur greenhouse operators with descriptions and many pictures of the insects and mites attacking their crops; methods of control; and an appraisal of all the new insecticides and their effectiveness in the control program.

SUN-DRYING FRUITS, by E. M. Mrak and H. J. Phaff, Cir. 392, July, 1949.

Good sun-drying practices for the farmer who has a drying yard for stone fruits, raisins or currants. Covers methods for drying apricots, freestone peaches, nectarines, clingstone peaches, pears, prunes, raisins, currants, cherries.

GROWING STRAWBERRIES IN THE HOME GARDEN, by Richard E. Baker, Ext. Cir. 151, May, 1949.

Designed to help the home gardener have better success with strawberries.

DONATIONS FOR AGRICULTURAL RESEARCH

Gifts to the University of California for research by the College of Agriculture accepted in July, 1949

BERKELEY

Carbide and Carbon Chemicals Corp. — 2 lbs. CRAG potato Fungicide 658
Division of Plant Pathology

Hercules Powder Company — 1 bag toxaphene
40–50# bags toxaphene
Division of Entomology and Parasitology

Merck & Company, Inc. — 50 micrograms of crystalline vitamin B12
Division of Poultry Husbandry

Naugatuck Chemical — 1 pt. N57–25E and 1 pt. 83N–25E
Division of Entomology and Parasitology

Niagara Sprayer and Chemical Division — 3–48# ctns. Kolofog
3–1 gal. jugs Hexamite
1–25 cap. jar Soilfume Caps
3–48# ctns. Niatox Crop Spray
1–24# ctn. Phoskil
Division of Entomology and Parasitology

S & W Tool Company — 1 quart Dianol insecticidal plaint
1 lb. Dianol Paint insecticide
Division of Entomology and Parasitology

Tobacco By-Products Company — 1 carton of dry nicotine concentrate
54 pounds 14% dry nicotine concentrate
Division of Entomology and Parasitology

R. T. Vanderbilt Co., Inc. — ¼ lb. Veegum
Division of Entomology and Parasitology

LOS ANGELES

Department of Recreation and Parks of the City of Los Angeles — $600.00
Division of Ornamental Horticulture

RIVERSIDE

Rohm and Haas Company — $3,000.00
Division of Entomology