

CA Storage Development Analyzed by Horticulturist

Editor's Note: This is a slightly condensed version of a talk on controlled atmosphere storage and handling of pears given by Elmer Hansen, OSC horticulturist during the recent Northwest Perishable Shippers conference held in Medford.

It's difficult to tell how far the trend will go toward commercial use of controlled atmosphere storage but there was a phenomenal increase in its use during the past two seasons, said Elmer Hansen, OSC horticulturist.

"However, the purpose, limitations and problems must be clearly understood so its development can proceed on a sound practical basis consistent with the best interest of the fruit industry," Hansen said. "This is particularly true for winter pears, since less is known about the specific requirements for these fruits. We do not have a background of commercial experience in working with CA storage for pears as we do for apples."

Five Considerations Given
Five major considerations should be given careful thought and attention before CA storage is attempted on any scale for any particular fruit, Hansen emphasized.

This is not an evolutionary development destined to replace general storage methods. It is supplemental, too, to refrigeration which can be used for specific problems.

After the specific problem is found packing house operators should determine whether sufficient research data could be obtained to show if the problem can be solved successfully by this method. It is not a cure-all for all fruit storage disorders.

"We do not have sufficient basic research information now to predict how changes in carbon dioxide and oxygen content will affect biochemical and physiological changes in keepability, flavor and texture of the fruit," the horticulturist added.

Some changes or side effects discovered so far in CA storage are loss of flavor in some apple varieties and increase in acid content. This may be desirable in some fruits but objectionable in others. Pears in CA storage ripen slower but shelf life greatly increases.

Lower Oxygen

Also, apparently pears can be stored at lower oxygen levels than apples. Suscepti-

bility of apples and pears to various types of disorders vary from season to season and according to variety. Reactions in controlled atmosphere storage should be observed over several seasons. Five years experience is required before safe recommendations for variety can be made.

Economic feasibility should be considered also. CA storage costs more to build. It requires constant daily checking and careful attention throughout the storage period. The important question is could the logical line of development be toward the relatively small CA storage owned and operated by individual shippers or toward the larger co-op or custom storages. No single answer seems logical, Hansen said.

Choice of materials and equipment is another important factor. Success will depend directly on whether ceilings, and the floor are adequately sealed against leakage so the required atmosphere can be attained and maintained after the room is loaded with fruit and closed. Builders are inexperienced generally in this construction. Packers must make them aware of the need to take extra pains and precautions to obtain a seal that will perform. A tight seal is even more important for pears since they must be stored at lower temperatures and have a lower breathing activity which determines the rate at which excess oxygen is removed from the storage room atmosphere.

Sheet Metal Recommended

Sheet metal should be used as a liner for remodeling storage rooms for CA. California and Washington packers who have tried it have all been successful with metal lining. However in new construction, especially concrete construction gas - proof liners other than metal can be used satisfactorily. A smooth surface is needed for application of gas-proofing material.

Pears are different from apples in handling since they must be ripened after removal from storage and before they are eaten. The fruit must be delivered to the consumer in good, edible condition with as much of the original quality as possible. Pears must be removed from storage and marketed while they still can be ripened with good quality. Residual life which fruit must

have after removal from storage so it can ripen properly must be considered.

A warning sign that the allowable storage period is ending for Bartlett's is a color change from green to yellow. D'Anjou pears do not show such a marked color change when they reach the end of this period and suffer a loss of eating quality. Generally, D'Anjou pears can be kept until early March at storage temperatures of 30 degrees without serious quality loss.

However, the same varieties in different pear-growing districts may vary in this way. Generally, past experience has shown that D'Anjou pears marketed toward the end of the season tend to become dry and mealy, lack shelf life and often scald severely. Conventional methods used in good handling and storage practices have not always been successful in correcting this problem, Hansen noted. And this is the type of pear problem for which CA may offer a practical solution.

Polyethylene Liners

By using polyethylene film liners the atmosphere in each box has been modified enough to boost keepability and eating quality, according to early results. However, offsetting this benefit is occurrence of brown-core when carbon dioxide concentration in the sealed bag in the box becomes too high.

"Until we have films of uniform permeability to carbon dioxide and until we know more about the seasonal variations in susceptibility of fruit to carbon dioxide injury, use of sealed film box liners cannot be used safely, generally," the horticulturist warned.

Favorable To D'Anjou

The D'Anjou variety responds very favorably to CA storage, according to experience during the last four years. The late season development of dry mealy condition has been successfully controlled. Fruit can be ripened with excellent flavor and texture as late as May, Hansen reported. Shelf life has been improved greatly, also. Scale is not a problem where the oxygen has been maintained at 2 to 2.5 per cent. No flavor loss has been suffered under these conditions. This makes it possible to market the variety over an extended season without any appreciable loss in original quality from the time the fruit is harvested.

"We do not have adequate information on some problems involving actual handling practices in CA rooms," Hansen stated. "More experience is needed commercially."

One difficulty is inspecting the fruit for decay and condition during the storage period, Hansen pointed out. In CA rooms boxes are loaded in so only those near the door can be reached.

"In the final analysis, economic feasibility of CA storage can be determined only by industry and the individuals concerned," the horticulturist concluded. "Fundamentally, the industry must decide how much importance can be attributed to eating quality and how far it is willing to go in preserving this quality for the benefit of the consumer during handling, storage and marketing of the fruit."

Traces History

In tracing the history of CA storage, Hansen remarked that controlled atmosphere storage has been practiced in the New England apple growing region for 20 years. Only recently has this method been used commercially on the Pacific coast, he pointed out.

"Three years ago there were no CA storages in our area (Oregon). This season approximately half a million boxes of apples and 75,000 boxes of pears are being handled in this way in California, Washington, Oregon and in British Columbia," the horticulturist continued.

"Gas storage" was developed in New England for handling apples subject to tissue injury when stored in cold temperatures, Hansen said. When stored at higher temperatures, 38-40 degrees, injury did not occur but storage life of the fruit was too limited for commercial purposes. By combining the modified atmosphere feature with 40 degree temperature, fruit could be kept satisfactorily over a prolonged period of time.

"Due to this method Eastern-grown McIntosh apples are strongly competing with Northwest Delicious apples and possibly pears," Hansen pointed out. CA storage has been used also to control Jonathan spot in the Michigan fruit district.

CA storage also made it possible to control internal browning in Newtown apples in areas with cool growing seasons such as the Watsonville district in California. First commercial use of CA atmosphere storage in the west was for Newtown apples in California and McIntosh apples in British Columbia.

If feeder cattle have been eating high-shrinkage feeds like silage and beet pulp, condition them for several days before shipping by reducing the amount of grain and rich feeds and replacing with dry feeds.

Farm and Garden

6 MAIL TRIBUNE, Medford, Or. Tuesday, March 8, 1960

--- CHIT CHAT ---

Annual Meets Set By SCS

Two soil conservation districts will hold their annual meetings this week and next, according to district spokesmen.

Annual meeting of the Rogue Soil Conservation district will be held at the Central Point Grange hall Thursday, March 10, at 8 p.m., according to C. W. Jensen, chairman of the board of supervisors.

The program will include a report on progress of the Talent Irrigation project and expected impact of the project on agriculture of the area by Walter Hoffbahr, Talent irrigation district manager, and Jack Nichols, bureau of reclamation office, Medford.

Election of two supervisors will be held, also.

The annual meeting of the Sams Valley-Beagle Soil conservation district is scheduled for 8 p.m., March 21 in the Eagle Point Grange hall, according to Elwood Abbott, district chairman.

Three supervisors will be elected, 1959 progress will be reviewed and 1960 plans for soil, water and plant conservation will be discussed.

Best results have been obtained with an atmosphere of less than 2 per cent carbon dioxide. A low level of carbon dioxide is required to prevent brown core, Hansen said. From the standpoint of scald control oxygen concentrations below 3 per cent have been most successful. A storage temperature of 32 degrees has shown satisfactory results some seasons, the horticulturist noted. However, when mealy breakdown has been serious some years best results have been obtained at 30 degrees.

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By JOE COWLEY
Mail Tribune Farm Editor

When you bought a few cans of baby food perhaps you looked at the wee tins and thought as we did. What a deal! Wish I'd thought of this! And you probably thought as we did that cull fruits and vegetables are used to make this baby food-fruit and produce with slight defects causing its discard.

But, that's not true! Gerber Baby Foods company, for instance, not only uses only the top grade raw materials but hires a large staff of agricultural specialists, field men and laboratory research men to make sure that fruits and vegetables produced for them are top quality, and transported and processed in the best, most economical way.

We learned all this from a pamphlet sent us by George W. Jones, principal horticulturist, Gerber Products company, Oakland, Calif. We were writing a letter to the horticulturist for a copy of his speech in handling Bartlett pears in bulk bins given in Medford before the Northwest Perishable Shippers conference. We had long been curious about this baby foods company, so asked for some general information on the company. From Jones's speech we learned that the company has a large farm operation to back up its processing plants. The company processes more than 100 items and most of the processing techniques used are trade secrets, the company horticulturist hastily assured us.

Right here the little wife snorts and remarks, "What's baby food got to do with farming? Why don't you write about farming?" Little Bit, one of Mr. Gerber's leading consumers, had just pulled half the typewriter ribbon off the machine, giving the wife a chance to review our work.

The Gerber agricultural people are working on at least two developments which the local pear industry is watching closely. One is controlled atmosphere storage and the other is use of bulk pallet bins instead of the smaller lug boxes. Briefly, this new type of storage is aimed at controlling the atmosphere or air surrounding the fruit in the warehouse so it will keep a high peak of quality longer. The pallet bins are equal to several of the smaller lug boxes. Using this method, the pickers dump the fruit from their buckets directly into the bins. The bins are designed to cut down on fruit handling, bruising, and time in getting the fruit to the processor.

The company is also experimenting with mechanical fruit and vegetable harvesting equipment. Its agricultural research department has developed an improved strain of Pink Banana squash. This variety has a high yield per acre and has a high quality and good color, consistency and flavor to make it highly suited to baby food processing. The company is also making fertility and irrigation studies.

The Gerber plants are located in Fremont, Mich.; Oakland, Calif.; Asheville, N. C.; Niagara Falls, Ont.; and Rochester, N. Y. These plants naturally cover a wide variety of agricultural conditions.

The newest plant is at Asheville. It was put in operation last fall. First packs there included applesauce, sweet potatoes, soups and other items. Peas, green beans, spinach, carrots, beets Irish potatoes, quah and sweet potatoes are scheduled for processing. Fruit will include peaches, apples, and eventually pears and apricots.

Canada, too, has its experiment stations. The Gerber pamphlet mentions the horticultural experiment station and products laboratory at Vineland near Niagara Falls, Ont. Growers who supply Gerbers rely on it heavily, according to the pamphlet. This station studies varieties, pruning, soil management, planting, fruit maturity, pest control and phases of processing, marketing and related cultural practices. In this area the Amber Gem peach was developed, noted for its fine flavor, texture, color and consistency.

The Fremont, Mich., plant is located in the Great Lakes area which covers a variety of soil types, has adequate rainfall and available water. In the section under Fremont, the pamphlet mentions that produce procurement is a year-around operation. Growers sign contracts with the company.

As we have mentioned often, 4-H clubs and Future Farmers of America are important to agriculture's future. The company apparently feels so, too. The Gerber company actively supports these youth organizations. "Many of these youngsters have held contracts with the company and continued them as they gained their own farms," according to the company pamphlet.

The Watsonville orchardists who send their apples to the Oakland plant were interested in extending their market season when Gerber, university and construction representatives started work on the controlled atmosphere storage. The company claims to have pioneered this storage method in California.

A spinach variety raised especially for baby food comes from the Alba and Walcott districts near the Rochester plant. Researchers have found mineral soils can possibly be used for spinach. New York state spinach growers normally raise it in muck soils.

Another development at Rochester was the mechanical harvesting of all the white seeded green beans needed for the plant.

This plant also processes carrots, green beans, pears, plums, apples, sweet potato and Irish potatoes.

So, when you buy some cans of baby food next time you will know of all the work and research which has gone into producing and processing that baby food.

The Ford Farm Almanac suggests you start performance testing records now, mark the young livestock so they can be matched with their mothers later, remember fertilized pasture starts first, lasts longer, last chance for soil tests, get manure hauled, broadcast fertilizer before you plow.

Meadow Mice Study Conducted

Corvallis - Oregon's real-life Pied Piper is doing more than playing a tune to rid farmers of meadow mice. He's conducting long-term research near Klamath Falls to pinpoint years mice are expected to do most damage, and thus save money for Oregon agriculture.

Edward L. Hansen, Oregon State college biologist, is trying to discover as much as possible about habits of this pesky animal. By learning to predict ups and downs of meadow mouse populations, he hopes to save farmers from a heavy infestation like 1957 when mice cost the state's agriculture millions of dollars.

During peak population cycles, meadow mice can damage a great percentage of a crop, and also may damage range vegetation. When survival conditions are ideal, the mouse population increases rapidly.

In years when an increase is expected, spring would be the best time to start a control program because of breed-

ing habits of the mice, he points out. Reducing cover probably will reduce their numbers, Hansen believes.

Mouse populations last year were quite low. Dry weather may have helped this. In some areas, less food was available and many mice failed to survive.

In the current issue of the OSC agricultural experiment station's research magazine, "Oregon's Agricultural Progress," Hansen tells plans to construct mouse-proof enclosures to determine effects of population levels on breeding activity and movement. In years ahead, work for prediction of population increases will be intensified, and a simple method of forecasting sought.

If a method to evaluate intensity of conditions excellent for reproduction survival and dispersion of young mice can be developed, scientists will have other important clues to the possibility of a damaging plague.

Special Seeder Developed for Range Lands

Corvallis - A special grass seeder that may revolutionize seeding on rough range lands and cut-over forest lands has been released by the Oregon State college agricultural experiment station for commercial use.

Further development of the new-type seeder so it can be used on a wider variety of range and forest lands was recommended at a recent meeting of the inter-agency range seeding equipment committee, reports Dean E. Booster, OSC agricultural engineer. The committee is made up of representatives from the bureau of land management, U.S. forest service, bureau of Indian affairs, USDA agricultural research service, and other governmental agencies.

The seeder will now be sent to the Arcadia Equipment Development center of the U.S. forest service, Arcadia, Calif., Booster said. There, it will undergo further development so it can be used on range and forest lands of the 11 western states.

The special grass seeder, known as "Desert Flower IV," was invented by Booster using principles developed by D. N. Hyder and F. A. Snea, range researchers at the Squaw Butte-Harney Branch experiment station near Burns, Calif.

Before seeding with the new machine, brush on land needs to be killed by plowing or discing, Booster said. The wide wheels on the seeder use its great weight to pack the soil to make a firm seed bed, and at the same time open small seed furrows in the packed soil. Seed is dropped in the furrows, and covered with loose soil by heavy drag links.

In tests on Oregon range and sagebrush lands, the special soil firming and furrow placement of seed has given faster sprouting, 2 to 3 times more survival, and higher yields after grass stands are established than grass planted with conventional equipment.

A one-quarter horsepower motor can do the work of 210 men.

Seed Producers To Meet Friday

Talent alfalfa seed producers will meet in the Jackson county courthouse auditorium Friday, March 11, at 8 p.m., according to Gene Winters, county extension agent.

Wallace Rice, manager of the Josephine Growers Co-op, will give an up to date report on the outlook on the Greece market for the next few years. Weed and insect control for the next few years will be discussed, also.

Progress on the program to introduce alkali bees into prepared beds as a means to improve alfalfa seed yields will be reported on, Winters said.

After nine years of study, scientists at Kansas State university conclude that grain is not necessary in the winter ration of heifer calves if the heifers get good quality roughage and a protein supplement.

It's a good idea to identify heifer calves. Dairy scientists point out the calves may be identified by ear tags, photographs or sketches showing color markings.

Grazing on good legumes for 20 minutes is the best vitamin pill for a pig.

Deputies Forced To Shoot Prowler

Dallas, Ore. - [AP] - A Polk county sheriff's deputy finally had to shoot a prowler Sunday at the post office here after firemen, police and even civil defense workers failed to scare the culprit off.

The intruder was spotted outside the post office and authorities feared he was attempting to get in. After a fruitless chase around the building, Deputy Virgil Taylor dispatched the unwanted visitor.

It was a skunk.

House Passes Bill Naming McKay Dam

Washington - [AP] - The House has passed a bill designating Detroit dam on the North Santiam river as Douglas McKay dam in honor of the late Oregon governor and secretary of interior.

Detroit, or McKay, is one of the army engineer dams in the Willamette basin project. McKay, as secretary of interior, was present at its dedication.

Sen. Richard L. Neuberger (D-Ore.) proposed last year that the name of Green Peter dam on the middle fork of the Santiam be changed to McKay. A change was made later to apply the name to Detroit dam.

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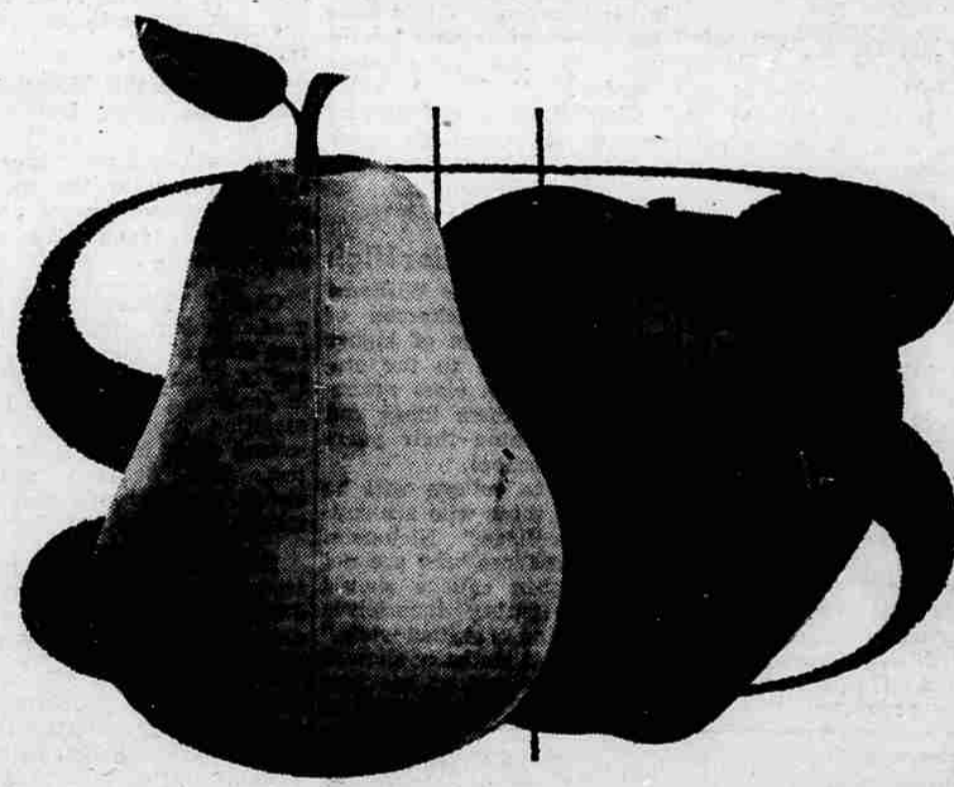
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