

Control Spoilage of Dates

Effectiveness of Fumigants Checked

By GEORGE C. SHARPLES

Soft dates grown in the Salt River Valley usually are not allowed to ripen completely on the palm. The fruit is picked after it attains its full quota of sugar, but before normal ripening is completed.

At this time the fruit contains a large amount of water. After fumigation, the ripening and dehydration of the dates is completed artificially under controlled temperature and humidity conditions. During years of excessive rainfall, losses due to spoilage in the field and during processing are heavy.

Three general groups of microorganisms cause date spoilage: (1) yeasts, which cause fermentation by the conversion of date sugars to alcohol; (2) molds, which may cause fermentation, but are more objectionable because of their woolly type of growth; (3) certain types of bacteria which cause souring by the conversion of sugar to lactic acid or by the conversion of the alcohol of yeast fermentation to acetic acid.

Tests Conducted

Preliminary studies were made during the past year at the University of Arizona's Citrus Experiment Station to determine the effectiveness of the commercial fumigants, methyl bromide and ethylene oxide (now used to kill insects), in destroying date-spoilage organisms. Small lots of partly ripened dates were obtained directly from the field and fumigated in small chambers where dosages were accurately controlled. Agar-plate cultures of treated and untreated dates were used as a measure of effectiveness.

The picture (lower right) shows typical cultures after fumigation for 16 hours at about 75° F. Ethylene oxide at the rate of 0.1 cubic centimeter per liter (equivalent to the commercial dosage of 1 pound per 1000 cubic feet) completely destroyed all yeasts and molds on the fruit,

leaving only the bacterial type organisms.

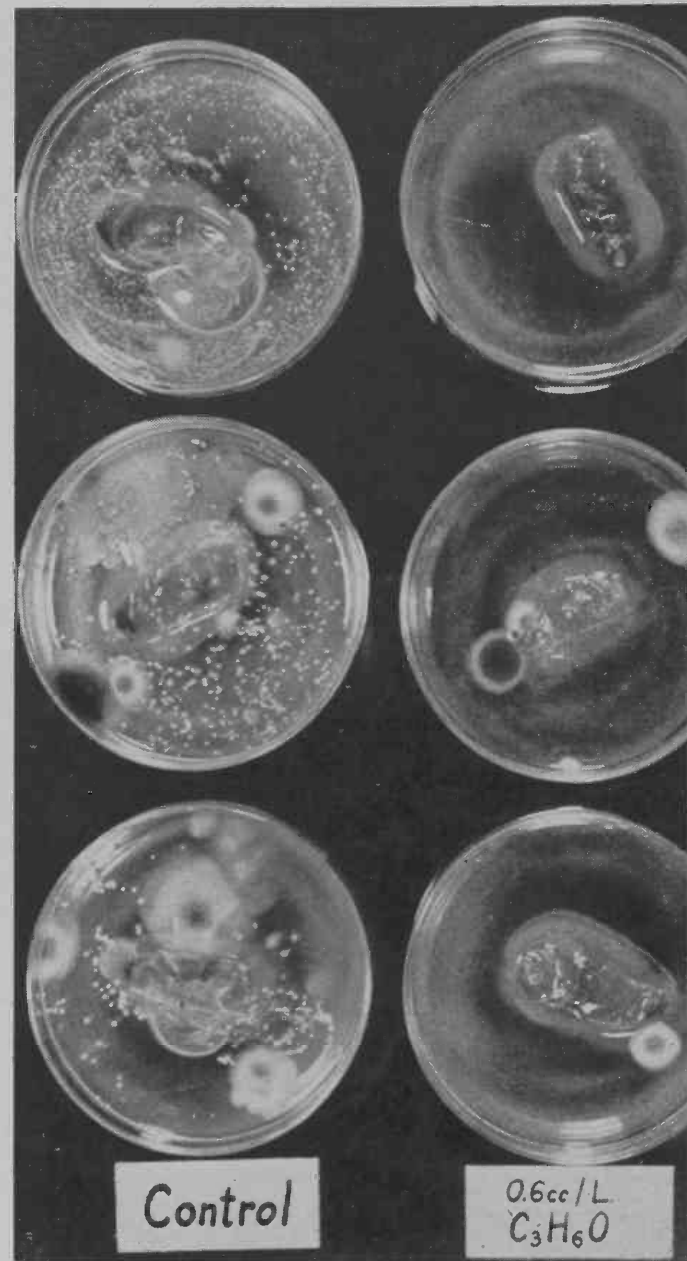
At a rate 10 times the commercial dosage, sterilization resulted. This concentration, however, caused tearing of the partly ripe fruit and reduced the grade. Equivalent concentrations of methyl bromide indicated this material to be slightly less effective. The higher concentration imparted bad flavor and stopped the ripening processes.

Commercial fumigants reduce the number of microorganisms found normally on the fruit, but the efficiency of these materials is limited at present because the fruit becomes recontaminated during washing, grading, maturation and storage. Methods of reducing these sources of contamination are under study.

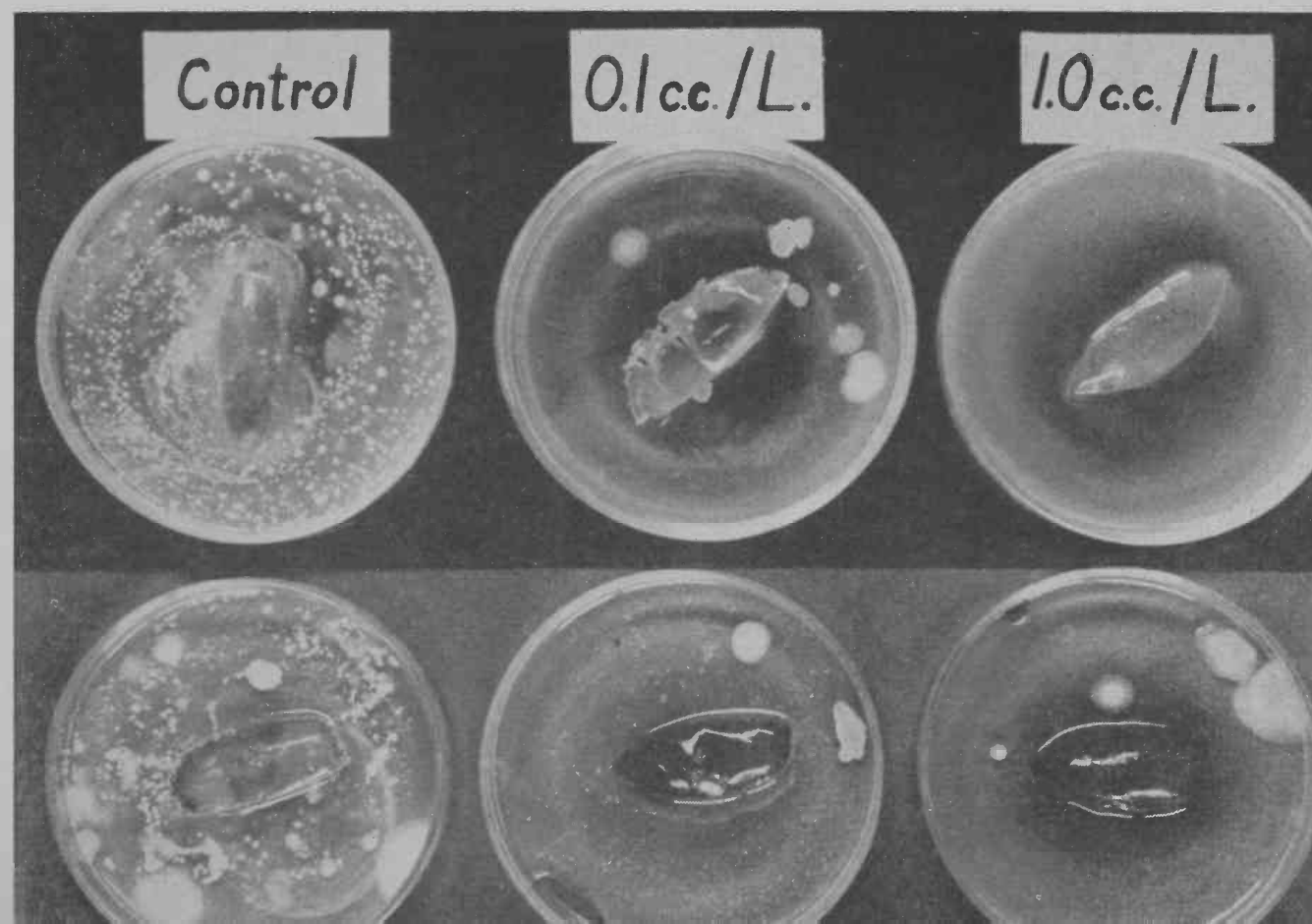
On the other hand, ethylene oxide and propylene oxide, a close chemical relative, are finding widespread use at present in many food-processing industries where spoilage during storage may occur. In the date industry it is common practice to store processed fruit under refrigeration in bulk until market conditions are favorable for retailing. Fruit is then packaged for shipment as the demand arises.

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Below are Cultures of Iteema dates showing fungicidal and bactericidal properties of ethylene oxide (above) and methyl bromide (below). (Scattered dots are colonies of micro-organisms.)



▲ Above are Cultures of Iteema dates showing fungicidal and bactericidal properties of propylene oxide. (Scattered dots are colonies of micro-organisms.)





Joan Hayman of Corpus Christi, Texas, studies different types of astringents.

By MILDRED R. JENSEN

American women spend a couple of billion dollars every year for cosmetics. Most women have to buy cosmetics rather blindly, relying upon recommendations from others who know little more about it than they do. The glamorous advertisements of cosmetics contribute beautiful pages to every woman's magazine, but are nearly blank as to real information. Cosmetics were added to the National Pure Food and Drugs Act as late as 1938, and the list still does not include soaps or the often-dangerous reducing agents.

For these reasons the girls in the costume-selection class of the School of Home Economics study how to buy and how to use cosmetics, as well as such subjects as becoming lines and colors, clothing budgets, and the care of clothing.

A little study of the chemistry of soap and how it is made usually explains to them that there are no precious ingredients in soaps. They learn that hard-water soaps usually contain water-breakers that are hard on skins; that medicated soaps often do not cleanse well and do not stay on the skin long enough to do much medication, and if used need to be chosen with a doctor's help.

They also learn that the large bars of cold-made soaps are likely to look like bargains, but usually contain extra water and uncombined alkali which is hard on skins; that castile soap is an excellent grade of soap, but expensive and not necessarily made from olive oil as it used to be.

From the occasional classmate who has allergy trouble, they learn that allergies to soap may be from dyes used to color the soap, or from perfumes. From the girl who hoarded some expensively perfumed soap, they learn that the perfume evaporates,

They Call It *Glamour Class*

Home-Economics Girls Study How to Buy and Use the Right Cosmetics

and that if one needs to pinch pennies it will be wiser to buy the perfume in a bottle and buy less expensively perfumed soap!

By the end of the first month even the laziest student is often stirred to start practicing a regular program of cold-cream cleansing and soap-and-water scrubbing after seeing the improvement in a classmate's complexion. By that time dozens of other cosmetics will have been studied and hundreds of questions asked and answered. The role of good health and good posture in good looks will have been pointed out many times.

Some of the most popular lectures

are the ones on makeup. After the girls have studied color and becoming colors for themselves, they are ready to pick colors in powder bases, powder, rouge, lipstick, etc. Picture lectures show both restrained daytime makeup as well as more dramatic evening makeup, and styles of makeup now in fashion, as well as tips for various facial types. Demonstrations that turn washed-out blondes and drab brunettes into more sparkling editions of themselves encourage the unskilled to recognize and practice good makeup techniques.

How do you know whether the
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Control Spoilage of Arizona Dates

(From page 5)

Tests have indicated that ethylene oxide and propylene oxide, when applied to sealed containers of dates, materially reduced the number of microorganisms present (See picture at top, page 5.) Applied in this manner, considerable loss might be avoided during shipping and other short periods of storage without refrigeration.

The use of these materials in the packaging of soft dates is recommended, but not without first mentioning a few important facts concerning their use.

Ethylene oxide is a gas at room temperature and must be mixed with a non-toxic, high-boiling liquid such as ethylene dichloride before use. Such a mixture is available commercially under the trade name "Fumold." Propylene oxide has a higher boiling point and may be used in the pure liquid form, though it vaporizes rapidly unless kept cool.

Both compounds are inflammable and therefore must be used with caution. Since their vapors irritate and cause damage to the mucous membranes of the eyes and throat, adequate ventilation is a prerequisite.

Commercial application is com-

monly done with automatic applicators in the packaging lines. However, hand applicators give satisfactory results. The recommended dosage is 0.5 cubic centimeter of propylene oxide or 1 cubic centimeter of Fumold per 1 pound box.

Rapid sealing of packages with moisture-proof cellophane is essential, since several hours are required for complete killing of all organisms. Furthermore, there would be little reason to apply such treatment to high-moisture fruits if they are to lose considerable moisture after packaging.

The best work available reporting on the toxic residues from ethylene oxide treatment indicate that it would be necessary to ingest more than 1000 pounds of treated fruit to obtain the lethal concentration. The same source reports no toxic residues from propylene oxide. From this standpoint, if any question arises as to selection of materials it would seem advisable to choose propylene oxide rather than ethylene oxide or Fumold.

—George C. Sharples is Assistant Horticulturist.