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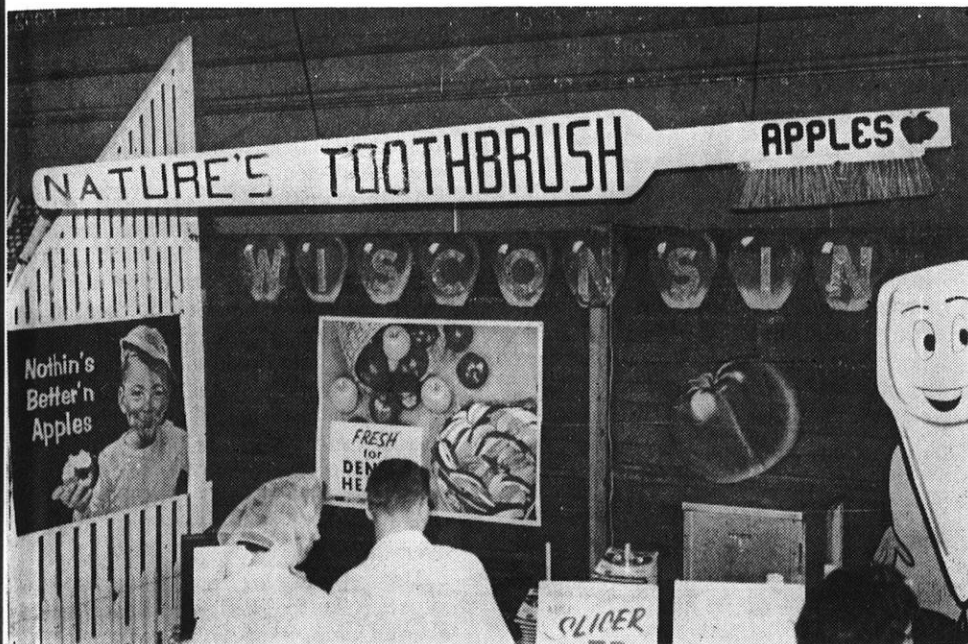
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SEPTEMBER, 1966  
Volume LI  
Number 1

# Wisconsin

# Horticulture

35¢ a single copy



A partial view of our attractive Apple Booth featuring the oversize specially designed toothbrush.

## STATE FAIR APPLE BOOTH

The apple booth down at State Fair Park in West Allis Aug. 12-21 increased its popularity again this year under the able direction of Henry Mahr, Leroy Meyer and Elroy Honadel and the assistance of daughters and other helpers. The educational theme was "Apples are Nature's toothbrush" featuring an oversize toothbrush and continuous showing of appropriate slides. Cold cider, cider popsicles and apple turnovers as well as our recipe books and apple corers were sold. Unfortunately it was too early for good eating apples and many potential customers were disappointed.

# WISCONSIN HORTICULTURE

Published monthly except July and December by the  
Wisconsin Apple and Horticultural Council, Inc.

Subscription — \$2 per year

(Mrs.) Nancy Knight - Executive Secretary and Editor  
5514 Dorsett Drive, Madison, Wis. 53711 Phone 233-9359

## OFFICERS AND DIRECTORS

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## Coming Events

Sept. 18-24 — "Wonderful Wisconsin Week" proclaimed by Gov. Knowles with special shorts on apples.

Sept. 23, 24, 25 — Gays Mills Apple Festival.

La Crescent Apple Festival.

Oct. 10 — Special half hour Apple TV show by Ken Hutson on La Crosse--WKBT.

Oct. 13-22 — National Apple Week.

Dec. 1-2 — Our Annual meetings at the Loraine Hotel in Madison.

## ADDITIONAL ACTIVE MEMBERS:

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## Wisconsin Apple Season Off to a Good Start

MARLON SCHWEIR

Wis. Dept. Agr. Marketing Div.

The apple marketing season is off to one of its best opening starts in the past 10 years. Demand, movement and price on the late summer varieties was exceptionally good and we have been informed practically all of the supplies were marketed.

At this writing, we are now moving into the early fall varieties, namely, Wealthy, Cortland and McIntosh. Presently, the situation looks quite favorable for a successful marketing season on these varieties. Demand and movement have been quite brisk with prices holding firm. Reports from other areas, particularly to the east of us, indicate that late summer crop conditions have not been too favorable. This, coupled with the early spring troubles, should make the marketing situation in the Midwest even better.

Also stimulating a good marketing situation is the fact the East, with a shorter crop, expects to hold prices at a higher level in an effort to assure satisfactory returns. Market reports indicate some buyer resistance to the higher prices, but this is always normal.

The success of holding the apple market at a satisfactory level will, of course, depend on each individual apple seller. The pressures of buying at lower prices are always present. Keeping abreast of the situations, knowing prices and making inquiries before making a commitment will help prevent market breaks.

## Minimum Wage Bill

As a result of a telephone conversation between your executive secretary and Senator Gaylord Nelson in regard to the omission of the piece rate provision in the minimum wage bill now before congress, the Senator issued the following communique. It covers the pertinent points that will affect Wisconsin agriculture.

"The 1966 Minimum Wage bill extends coverage under the Fair Labor Standards Act to farms employing workers for 500 man days during a calendar quarter.

A man day is defined as "any day during which an employee performs any agricultural labor for not less than 1 hour." This works out to having 7 full-time employees.

Employees engaged in range production of livestock are counted towards determining the man day requirements but are not covered by the act.

The Green Amendment exempts from coverage employees working at jobs customarily paid on a piece rate basis (hand harvesters) who commute daily to work and work less than 13 weeks a year at agriculture. Therefore, one who commutes daily but works more than 13 weeks a year is not exempt. Children 16 or under working with their parents in the field on

a piece rate basis are also exempt. Agricultural workers are to be paid \$1.00 per hour the first year of coverage, \$1.15 per hour the second and \$1.30 per hour the third year.

All hand cultivation workers are exempt from coverage.

Sugar workers (hand harvesters) are covered.

Children under 16 cannot work at jobs declared by the Secretary of Labor to be hazardous."

Senator Gaylord Nelson

## Roberts Honored

Ray H. Roberts, emeritus professor in the University of Wisconsin department of horticulture, was named a Fellow of the American Society for Horticultural Science at the group's annual banquet.

The award recognizes Roberts for "outstanding contributions to horticulture and service to the society in furthering its objectives of promoting scientific research and education in horticulture." The award was made in conjunction with the 63rd annual meeting of the American Society for Horticultural Science at the University of Maryland, Aug. 14-20.

Roberts joined the University of Wisconsin department of horticulture in 1915 as an extension specialist, and retired as a professor of horticulture in 1960.

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If you are no longer interested in our publication, please notify us by returning your label and we will remove your name.

If you are not now a member and not a Wisconsin apple grower and wish to receive WISCONSIN HORTICULTURE, please remit \$2 for the magazine subscription.

WISCONSIN HORTICULTURE  
5514 Dorsett Drive  
Madison, Wisconsin 53711



## September in the Orchard

G. C. KLINGBEIL

Extension Specialist, Fruit Production  
University of Wisconsin

One of the most critical times for orchardists is that time when varieties are being harvested that will go into storage. Those growers having quantities of McIntosh, Cortland and Delicious should take special precautions to get fruit into storage in the best shape possible. Let's look at a few important factors that will help to improve the product you put into storage.

1. Instruct pickers on how to remove apples from the tree. Finger bruises, stem punctures, cuts and bruises will reduce quality and storage life.

2. Avoid rough handling. Bruises do speed certain enzymatic changes that you cannot see but do change quality and shorten storage life.

3. Move harvested fruit into storage as rapidly as possible. Apples left in the field for 5 days at an average temperature of 70° F. will have their storage life cut in half. McIntosh under good conditions have a storage life of 120 days. Just 5 days at 70° F. reduces this by 60 days.

4. Pick fruit at proper maturity. Overripe fruit has a shorter storage life and generally poorer quality. Fruit to be stored should be harvested slightly on the "green or immature" side. If you have applied sprays to reduce drop, be quite cautious that fruit does not become overmature for storage.

Here are some suggestions to help maintain quality after fruit is in storage.

1. Cool apples as rapidly as possible. This can be helped by allowing for good air circulation around boxes as well as within boxes.

2. Maintain good air circulation and ventilation in the storage. Adequate air movement should be provided by fans. Be certain that boxes are not stacked tight against the walls and that strips are placed under lower crates to allow

(Continued on page 9)

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## Orchard Assessments

Albert Ten Eyck  
Pine Bluff Fruit Farm

Would you have any objection if your apple and cherry orchards were to be assessed as real estate on a per tree basis with a total value per acre of \$1000.00 or more in addition to the value of the land? This happened in the state of Michigan and the situation became so serious that it threatened to destroy the Michigan fruit industry. The growers, with the help of the Michigan Farm Bureau, put a stop to the assessing of trees as real estate by getting a bill through the Michigan legislature which exempts all commercial fruit trees from such taxation.

Reassessment is now taking place in Wisconsin and assessors are placing a value on individual trees and adding this to the land value. There is no reason to believe that Wisconsin assessors will be any more reasonable than the Michigan assessors. It is, therefore, of the utmost importance that all fruit growers in Wisconsin work together to put a bill through our legislature which will exempt fruit trees from taxation. Mr. Wm. KasaKaitas of the Wisconsin Farm Bureau states that it will be far easier to pass such a bill before assessments reach high levels and are producing considerable revenue than afterward. He also states that inasmuch as fruit growers are small in numbers, the personal help of ALL GROWERS will be necessary if such a bill is to pass. Bill says that legislation of this nature is hard to pass in Wisconsin regardless of its merits.

We strongly urge all growers to take an active interest in this effort to exempt fruit trees from taxation, beginning now. Talk to your county Farm Bureau Directors and ask them to let the State Directors know that they approve and want State support. Write to Mr. KasaKaitas at 801 W. Badger Road, Madison and tell him you are ready to help. Come to the annual

meeting in December at Madison and prepare to make your presence known when this bill comes before the legislators of the State. Let this be one occasion when YOU do something yourself rather than letting someone else do it for you. Unless all fruit growers join now to exempt fruit trees from taxation, we will all be in serious trouble in a few years.

## Award to Gabelman

Warren H. Gabelman, chairman of the University of Wisconsin department of horticulture, was presented the Marion Meadows Award which recognizes "outstanding papers in vegetable research," at the annual banquet of the American Society for Hort. Science at the University of Maryland.

Papers were judged on the basis of originality, accuracy of data, significance of findings and clarity of paper. Gabelman's research demonstrates the harmful effects of ozone on onion plants. Ozone is a naturally occurring gas that frequently accumulates during thunderstorm activity. Onion tipburn has been responsible for significant economic losses to vegetable growers.

## Wis. Dept. of Agri.

MADISON—John Polich, 50, has been appointed cash crops marketing specialist with the Wisconsin Department of Agriculture's Marketing division.

Polich began work in the division's Commodity Service section Sept. 12.

A 26-year veteran in vocational agriculture instruction, Polich has taught at Kewaunee high school since 1956. He is a past-president of the Wisconsin Association of Vocational Agriculture Instructors.

The new marketing specialist earned a master's degree from the University of Wisconsin in 1950. He is a graduate of Wisconsin State University at Platteville.

Polich is married and has four children.

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## Disease Notes

EARL K. WADE

Extension Plant Pathologist

### Fire Bight

There have been some questions about removal of blighted twigs, branches and cankers from apple and pear trees that became infected this season. It is now too late to prune out blighted wood. Removal of blighted twigs and branches earlier in the season as soon as they appear can be beneficial if adequate sanitation procedures are followed. However, pruning out infected wood late in the season does not allow time for the wounds to heal over at least partially before the trees go into a dormant situation. Thus, the open wounds are exposed to the elements over a longer period of time before new growth and the healing-over process is initiated next spring. In the meantime fungi causing heart rot may gain entrance through these unprotected wounds as well as certain insects, and by the end of next summer you may end up with cankering and wood rotting instead of sound well-healed-over wounds.

When it is necessary to remove a branch or limb or do some trimming late in the season, it is advisable to paint over the cuts with orange shellac. This should provide an adequate seal until the wounds start to heal over in early summer.

Probably the best time to prune out blighted twigs and branches is during late winter and early spring before growth starts.

### Miscellaneous Ailments of Apple Fruit At Harvest Time

Although it is now too late to prevent or control the diseases, etc., described below, a brief description of the symptoms may at least help in identifying the trouble, and the suggested control measures can be of some help next season.

### Sooty Blotch and Flyspeck

These two infections often appear together on the same fruit. Sooty blotch

is caused by a fungus organism called *Gloeodes pomigena*; flyspeck by the fungus, *Microthyriella rubi*. Symptoms of the first disease are superficial dark colored smudges or blotches on the fruit. These smudges are actually hundred of spore bodies (pycnidia) containing spores of the fungus connected together by branched, thread-like fungal growths (hyphal threads). The fungus growth can be removed by vigorous rubbing.

Flyspeck appears as numerous tiny black, often glistening spots resembling actual flyspecks. These generally occur in groups, with 10 to 50 flyspecks in each group. They are also a type of spore bearing structure (ascocarps).

Both diseases are favored by cool, humid weather and are generally restricted to the lower, shaded areas of the orchard.

Such fungicides as captan, zineb and glyodin should control these infections satisfactorily. Where a fungicide such as dodine is being used for scab control, one pound of zineb, 75W can be added to the spray in the late summer applications.

### Cedar-apple, Hawthorn, Quince rust

These three rust diseases are quite similar and produce similar symptoms on the fruit, including pear as well as apple. The rust lesion appears at or near the calyx end of the fruit. The affected areas from cedar-apple and hawthorn rusts may be from  $\frac{1}{4}$  to 1 inch in diameter, and are somewhat raised or thickened and rough, having an orange-yellow color. Sometimes tube-like protuberances called aecia appear in each spot. These contain spores.

The fruit lesions of quince rust are similar except that they are larger, dark green in color, and do not contain aecia. Quince rust lesions usually deform the fruit by stopping growth where the lesion is located at the calyx end, and forms a deep, crater-like depression.

Wealthy and most ornamental crabs are very susceptible to cedar-apple rust.

(Continued on page 10)

## September in the Orchard

(Continued from page 4)

for air movement. About 1½ to 2 feet of space should be left between the top of the highest box and the ceiling.

3. Keep the relative humidity as near 85 to 90 percent as possible. It may be difficult to reach this humidity early in the season when crates are dry. Additional moisture can be added by sprinkling.

4. Keep mechanical equipment such as fans, direct expansion pipes, finned coils and air purification equipment in good working order.

5. Do not attempt to keep fruit longer than maximum storage periods. Average storage life for certain varieties picked at proper maturity and stored immediately at 32° F. are: McIntosh and Cortland, 3 to 4 months—maximum 5 months; Red Delicious, 3 to 4 months—maximum 6 months; Golden Delicious, 3 to 4 months—maximum 5 months;

and Jonathan, 2 to 3 months—maximum 4 months.

6. Varieties that lose moisture readily such as Golden Delicious can be stored in containers with polyethylene liners. Do not seal the liners completely.

## Group Disbands

The Milwaukee County Fruit Growers at a recent meeting, voted to disband the organization because of small membership. It was voted to turn the balance on hand in the treasury over to the Wisconsin Apple and Horticultural Council, Inc.

## "SOCIAL SECURITY SENTENCE"

People who were 65 before March, 1966 and did not enroll for medicare may still enroll before October 1, 1966 if good cause can be shown for the late enrollment.

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## DISEASE — from page 8

Jonathon, Rome Beauty and York Imperial are also susceptible. Golden Delicious, Delicious, Transparent, and Duchess are resistant. On the other hand, these and most other varieties resistant to cedar-apple rust are susceptible to quince rust.

Adding  $\frac{1}{2}$  to 1 pound of ferbam, zineb, Niacide or thiram (Thylate) to the regular scab sprays starting at the pink stage of bloom and continuing through spray applications should control these rust infections.

### Pin Scab

This is the result of inadequate scab control late in the season, especially in the case of susceptible varieties. At harvest time the fruit appears to be free from scab; however, after a storage period of several weeks tiny scab lesions ranging in size from a mere pinpoint to  $\frac{1}{8}$  of an inch in diameter appear on the apples. These dark colored scab lesions are often mistaken for some other disease, or some type of breakdown.

If scab infection is present in the orchard even in small amounts, the regular fungicide sprays for scab control should be applied to within 14 days of harvest. Dodine would be a good choice for these late sprays. It can be applied to within 7 days of harvest, providing none of the apples are used in the manufacture of apple pomace for livestock feed.

### Water Core

This is a physiological breakdown that occurs both in the orchard and in storage. It is influenced by certain environmental conditions during harvest and storage. It usually is prevalent during the maturing phase of fruit development. Certain varieties such as N. W. Greening, and Delicious, appear to be more susceptible than others.

Water core is more likely to be found on fruit from exposed portions of the tree where it has been fully exposed to the sun and where temperatures are high. It is not easy to detect apples af-

ected by water core from an external examination; frequently an unnatural bluish or dull area is visible on the exposed face of the fruit. When the fruit is cut open, certain areas in the flesh, usually around the vascular strands, are "glassy" in appearance. The tissue is not soft, but on the contrary may be firmer than the surrounding flesh. The affected areas may appear in a regular arrangement around the core, or only in the exposed half. They may be from quite small definite spots to large irregular areas which extend from the core to the skin.

It has been shown that excess sap concentration is responsible for the development of water core and that this occurs more frequently in apples exposed to high temperatures.

Water core can be controlled to a certain extent by cultural practices. Late-picked apples show a decided tendency to develop water core since sap concentration increases with maturity. The production of good foliage which will shade a high percentage of the fruit should help in reducing water core.

### Bitter Pit

This is also a physiological disease. The cause is not known. Wealthy is quite susceptible to the disorder, followed probably by Golden Delicious and Red Delicious.

Bitter pit is more likely to occur when the crop is light and the apples are larger than normal. It often starts to ap-

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pear in the summer fairly early. First symptoms are slightly sunken, water-soaked circular spots, dark green in color, accompanied by a small amount of internal browning. A fruit may have from one to several such spots. They are commonly found near the calyx end, but may occur anywhere on the fruit. As the fruits mature the spots become more sunken, with a dry, brown corky area underneath extending up to  $\frac{1}{4}$  inch into the fruit.

There is no known control for bitter pit. Attempts to reduce the condition by regulating the water and nutrient supply have been unsuccessful.

### **Honey Producers**

WM. LUESCHOW  
Wis. Agr. Plant Div.

The Wisconsin Beekeepers Association became the Wisconsin Honey Producers Association, by action of the 1965 convention at Rice Lake. They are meet-

ing under their new name, on November 4 and 5, at Wisconsin Rapids, this year.

A part of one day's program will be devoted to the discussion of revising and updating Wisconsin's beekeeping laws. A committee of beekeepers has prepared a proposed draft of laws which was discussed at the summer district meetings. Suggestions and changes proposed at this summer's meetings will be considered and acted upon.

Dr. Floyd E. Moeller, Investigations Leader of the U. S. Bee Culture Laboratory at Madison, will speak on the subject of bee disease control. He is expected to discuss present day control methods, with their possibilities and their problems. Research history is being made every day in this field and Wisconsin beekeepers are fortunate to have this research facility so readily available.

Mr. Glen Gerhardt, area director of the Production Credit Association, will present the service aspects of his or-

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ganization which are available to beekeepers. Financing for beekeepers is a perennial problem. The hazards of crop failure and loss to disease, close some normal agricultural financing sources to beekeepers. Mr. Gerhardt's presentation should be of special interest, for this reason.

Several county associations will again present candidates for the Wisconsin Honey Queen Contest. The crowning of the new queen will be a highlight of the Saturday evening banquet program. The reigning queen is Miss Margaret O'Brien of rural Manawa.

## Apple Growers Approve Promotional Assessment

A North Carolina self-assessment program was approved by the required two-thirds majority in a grower referendum on July 6.

The Apple Growers Association, certified by the State Board of Agriculture as the agency representative of the State's commercial apple growers, conducted the referendum and will administer the funds collected in a program to promote the use and sale of North Carolina apples.

Collection of the assessment will begin with the 1966 crop sold by producers. Amount of the assessment is three cents per bushel, or bushel equivalent, for all apples packaged for sale, and three cents per 100 pounds for apples sold to processors, excluding fruit sold for juice.

## A Review of Apple Marketing Research

A review of recent literature on maintaining quality of apples from harvest to retail outlets has been published by the U. S. Department of Agriculture.

More than 1,200 research publications are represented in the review which

deals primarily with studies reported since 1945 by USDA, State Agricultural experiment stations, and other organizations both in the United States and abroad. Economic phases of marketing are not included in this report; these were reviewed in a 1963 USDA publication. Literature on engineering and marketing facilities are also largely excluded, although a few references relating to costs, engineering, and marketing facilities are discussed when they concern the subject being reviewed. The largest section in the report—184 citations—deals with literature on market diseases.

Copies of "A Review of Literature on Harvesting, Handling, Storage, and Transportation of Apples." (ARS 51-4) may be obtained by writing to Horticultural Crops Research Branch, Market Quality Research Division, ARS, USDA, Beltsville, Md. 20705.

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## Are Apple Maturity Standards Necessary?

MARLON SCHWEIR

Wis. Dept. Agr. Marketing Div.

Each year as we move into the market season we hear complaints of immature, off-color fruit reaching the market. Some of the complaints are registered by growers who feel that immature fruit spoils consumers' likes for apples which curtail potential sales.

To some extent, these complaints are justified for we also receive comments from consumers expressing opinions of poor quality fruit, tartness, tasteless and generally unsatisfactory.

As we discuss this with various growers, their reasons for selling are many: The demand is there. The buyer wants them. Many consumers want this fresh apple—not necessarily for eating but other uses. My apples are red or they have sufficient color. The apples we sell early help take the pressure off of

sales later. Most important, the prices are attractive. They argue on the old saying, "A bird in the hand is better than two in the bush"—meaning that the money I get now helps to make up the deficit of selling below cost later—and finally they ask, "Does selling immature fruit really curtail future sales?"

There is no question these are sound argumentive points. Year after year we have continued to sell immature apples. The demand is there; early prices are generally attractive and higher than later prices. Nobody has substantiated that a consumer who buys immature fruit will not buy apples later and most soundly is the fact that the 1,000, 10,000 or million bushels sold early will not compete with the volume later.

The fact remains, however, that we should not grow apples to sell before they are mature. Mother Nature, along with the plant breeders, have developed varieties to mature at various times in

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an effort to meet consumers' desires and to extend the marketing season. Each has a season, however, areas and climatic conditions do cause overlapping.

Several states have adopted maturity standards. Should Wisconsin follow a similar pattern?

## Mouse Control in Orchards

GEORGE KLINGBEIL and

CHUCK KOVAL

Univ. of Wis. Extension Specialists

Wisconsin orchardists are urged to check their fruit plantings carefully to determine the status of meadow mouse populations. If fresh runways and tunnels are found in the duff and mulch under the trees, several partially eaten fruit are found under each tree, or even fresh wounds are found on the base of trees caused by mice feeding on the bark, it is a sure sign that plenty of mice are present in the orchard. In order to reduce the chances of further damage to the trees caused by mice feeding, immediate steps must be taken to reduce the population.

Several methods can be used to control mice or to reduce mouse damage. Probably the most effective and least costly program in the long run is to incorporate into your orchard management such practices that will discourage high mouse populations over a continuing period of years. The areas providing undisturbed breeding, those with excessive mulch accumulation, and trash and crates in orchards that afford good cover for mice should be eliminated.

Growers are urged to check and replace, if necessary, the hardware cloth protectors around young trees and where practical to continue their use even on older bearing trees. One-half-inch cloth eighteen inches high is usually adequate. The use of chemicals or mechanical vegetation control around non-bearing and bearing trees is encouraged. It is practical to eliminate all vegetation for a distance of three feet from each tree trunk.

Mice prefer not to feed or rest in areas without cover, thus the practice will reduce tree damage caused by mice feeding on the bark.

The second method used to reduce mouse populations is the use of poison baits. Bait treated with zinc phosphide and placed in active runways is very effective— $\frac{1}{2}$ -inch apple cubes treated with zinc phosphide rodenticide are best. Zinc phosphide-corn-oats bait broadcast in the orchard is also effective. Heaviest baiting should be in locations where mouse populations are the highest. Prepared corn-oats bait should be applied at the rate of 6 to 10 pounds per acre. Zinc phosphide prepared baits and zinc phosphide rodenticide can be obtained from orchard supply houses or ordered directly from U. S. Fish and Wildlife Service, Branch of Predator and Rodent Control, Purdue University, Lafayette, Indiana 47907. Strychnine-treated oats, a less desirable bait, can be obtained from the same source. Some reduction in bait cost can be had by home mixing; for directions, contact your horticultural agent, county agent, or specialist at the College of Agriculture, University of Wisconsin, Madison, Wisconsin.

The least desirable method of control is the use of endrin as a ground spray. The use of endrin for this purpose is strongly discouraged by the U. S. Fish and Wildlife Service, Wisconsin Conservation Commission, Wisconsin Department of Agriculture, and specialists at the College of Agriculture. Because of the toxicity of the material and other findings, it can only be used by permit. The permit and other regulatory information can be obtained from the Wisconsin Conservation Department, Post Office Box 450, Madison, Wisconsin.

In summary, Wisconsin orchardists are urged to consider such management practices as vegetation control, using tree protectors, and orchard sanitation to reduce mouse population build-ups and to reduce mouse feeding damage to



trees. Poison baits such be used at levels necessary to reduce mouse populations and the use of endrin as a ground spray is discouraged but can be used by permit.

## Wisconsin's Farm Orchards

G. C. KLINGBEIL

Associate Professor of Horticulture  
The University of Wisconsin

It is a matter of record that before 1800 an apple orchard was a recommended part of every farmstead in Wisconsin. As early as 1830, small commercial orchards were established to provide cash income to farmers. In 1865, a state organization of horticulturists—mainly apple growers—was established; its main objective was to advance the art and science of horticulture throughout the state. At the turn of the century, a major program of the Wisconsin State Horticultural Society was to establish and maintain trial orchards throughout the state so to obtain information about orcharding. These trial orchards were established near Sparta, Ithaca, Poplar, Gays Mills, Whitehall, Pewaukee, Baraboo as well as a number of other locations. The information gathered provided the basis for the recommendation that each farm should have an orchard not only to improve and increase the family fruit supply, but also in some cases to provide a source of additional cash income for the farmer.

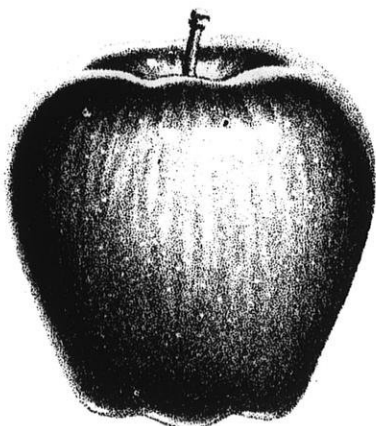
Itinerant nursermen sold thousands of fruit trees to farmers during this period; some even planned the orchard and planted the trees. Unfortunately, too many of these salesmen never returned to train and prune the trees and most farmers at that date had little knowledge of fruit culture which, of course, often resulted in orchards of poor production and certainly unsightly to a horticulturist.

After the trial orchards had provided an accumulation of experience and more information about apple production became available, a greater number of siz-



able commercial apple orchards were established. In one annual report, it was stated that nearly one thousand acres of apples will be planted in Wisconsin during the spring of 1911. If the home or farm orchard was to be counted, the acreage would be more than doubled. It takes little imagination to see some of the problems that were ahead for the farm orchard. When the larger commercial orchards began producing quality fruit, the farm orchard—generally poorly tended and seldom sprayed—had little market or use for even modest quality fruit.

About 1920 and the years following, came the first organized effort to establish a feasible means of controlling the many pests that troubled Wisconsin farm orchards. The extension specialist in charge of fruit programs from the Department of Horticulture, University of Wisconsin, developed a plan that served well for twenty years or more. Through educational meetings and the aid of county agents, many "spray rings" were developed. A "spray ring" is a cooperative organization of farm orchardists, established for the purpose of producing more and better fruit. The group usually consisted of ten to fifteen members that cooperatively owned a power sprayer, hired an operator to do their spraying, and in addition they also purchased



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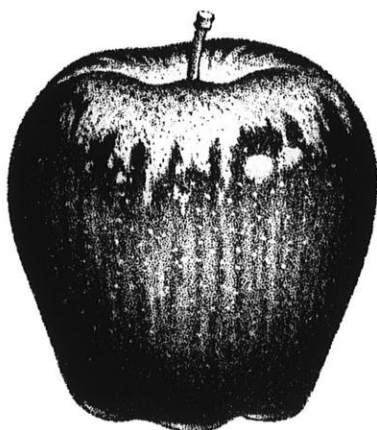
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# OR OTHERWISE

## ORCHARDS — from page 16

orchard supplies and equipment. In the ten-year period, from 1920 to 1930, over two hundred such cooperatives were formed. In 1943, there were about 225 spray rings in 33 counties with nearly 3,000 members. In addition, there were nearly 200 custom spray operators. From that date on, however, the number of active spray rings began to decline. The war years, an increasing shortage of skilled operators and the ever increasing cost of labor made it less and less economical to continue the cooperative spray ring. Today, there are less than ten such rings in operation. Probably the two most successful are in the communities of Winchester in Winnebago County and Black Creek in Outagamie County. Professor Vernon Peroutky, the extension agent in Outagamie County, has proven that through an educational program such organizations can still function successfully. What has happened to the hundreds and hundreds of farm orchards that were developed during the "heyday" of spray rings? Many have enlarged so that owning their own sprayer and other equipment is feasible, but most of them are still occupying valuable land around or near the farmstead buildings. I would estimate that over 50% of farmsteads over 20 years old has an orchard and likely 98% of them are uncared for. The census of 1945 showed about 90,000 farms reported an orchard.

Unfortunately, these orchards are old, unproductive and unsightly. They certainly provide little to add to the beauty of a farm. In addition, they occupy valuable land areas near the buildings that cannot be used for other crops.

Today, Wisconsin has over 10,000 acres of commercial apple orchards that can produce three million or more bushels of fruit. These orchards are from 5 to 200 acres in size and produce for the wholesale, retail, roadside market and on-the-farm sale. Quality apples are readily available at all levels of market.

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## ½ BUSHEL S:

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OCTOBER, 1966

Volume LI

Number 2

# Wisconsin

# Horticulture

35¢ a single copy



## Our Special Apple Display on Michigan Avenue in Chicago, Illinois Featuring Complimentary Apples.

The special October apple promotion display at the Wisconsin Conservation office is the result of a joint endeavor between your Council, the Marketing division of the Wisconsin Department of Agriculture and Mr. Jim Alexander, the office director. Not only is it in a busy location but the office receives extra heavy traffic at this time of year from hunting license applicants.

# WISCONSIN HORTICULTURE

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Ernest L. Chambers

### Ernest Chambers, Retired Plant Industry Div. Chief, Dies

Ernest L. Chambers, 69, retired chief of the Plant Industry Division and State Entomologist, died unexpectedly at his Sturgeon Bay home, Tuesday, August 2, 1966.

Mr. Chambers, who retired in 1961, had been with the Wisconsin Department of Agriculture since 1927. He had been a member of the Entomological Society of America since 1922 and was a life member of the Wisconsin Horticultural Society and its Treasurer from 1927 to 1958.

He was also Secretary of the National Plant Board from 1929 to 1932 and served on the editorial board of the Journal of Economic Entomology from 1952 to 1958. From 1927 to 1951 he was manager of

the Wisconsin State Fair Flower Show, a job which had special significance for him.

Mr. Chambers retained his membership in the Christ Presbyterian Church of Madison and until his retirement, he resided at 2114 Madison Street. He was also a member of the Madison Optimist Club, the American Legion, and the Commonwealth Masonic Lodge No. 325. He served in the Medical Corps at Walter Reed Army Hospital, Washington, D. C., during World War I.

After receiving his Bachelor of Science Degree from Ohio State University, Mr. Chambers later earned a Master of Science Degree from the University of Wisconsin in 1925.

He is survived by his wife, Crystal, a son and daughter, and five brothers. Burial was at San Bruno, California.



## Review of Wis. Statutes

Chapter 129.01 of the Wisconsin Statutes states that, "No person shall engage in the business of a trucker, hawker or peddler without having a license for that purpose, but nothing in this chapter shall prevent any person from distributing or selling any agricultural product which he has grown in this state.

"A person who temporarily engages in the sale of produce or merchandise at any place in this state and does not become or intend to become a permanent merchant at such place will be considered a 'transient merchant'."

"A person who conducts his business as a transient merchant must first obtain a 'transient merchants license' from the Wisconsin Motor Vehicle Department. The cost of this license is \$75.00 plus \$100.00 for each day that he conducts his business in any county, village or city."

The above laws were primarily enacted to protect the farmers and agricultural market owners of this state. These laws protect Wisconsin growers by placing certain restrictions and heavy license fees on any out of state growers who wish to temporarily peddle their commodities in this state in direct competition with the resident growers of this state.

The Wisconsin Motor Vehicle Department also has other laws which were

enacted to save lives and promote safety for the owners and patrons of roadside markets.

Some of these laws that apply directly to roadside markets are as follows:

1. The operator of a vehicle shall stop before entering a highway and shall yield the right of way to other approaching vehicles.
2. The operator of a vehicle that has been parked shall yield the right of way to all approaching vehicles on the highway before moving from the parked position.
3. No person shall park or leave standing any vehicle unless there is left an unobstructed width of at least 15 feet on the roadway opposite the vehicle for the free passage of other vehicles.
4. Standing vehicles must be capable of being seen by operators of other vehicles from a distance of 500 feet in either direction along the highway.

This means that excessive bushes and shrubbery at roadside entrances should be removed or cut back to allow a clear unobstructed vision.

—Paul Genna

Wis. State Patrol Sergeant

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Madison, Wisconsin 53711

# 1966 ANNUAL MEETINGS, DEC. 1 AND 2, LORAIN HOTEL, MADISON, WIS.

## PLAN NOW TO ATTEND

### General Meetings

Convention time is fast approaching. An outstanding and stimulating program has been arranged as the following will verify.

Opening keynote address—Dr. Robert Spitzger, Pres., Murphy Products, Inc.

“Merchandising Fresh Fruits and Vegetables” — Chan Copps, Produce Buyer, Copps Company, Stevens Point, Wisconsin.

“The Michigan Apple Commission and Its Responsibility to the State’s Apple Industry — Fred Hasler, Secretary-Manager, Michigan State Apple Commission.

“Agricultural Records As An Aid to Greater Fruit Profits” — Dr. John Schmidt, Chairman, Department of Agricultural Economics, University of Wisconsin.

“A New Look at Rodent Control” — a panel. G. C. Klingbeil, Extension Horticulturist, University of Wisconsin; A. W. Cole, Extension Horticulturist, Herbicides; C. F. Koval, Extension Entomologist, University of Wisconsin.

“New Trends — New Practices — New Equipment for Spraying”—Dr. A. E. Mitchell, Professor of Horticulture, Michigan State University, East Lansing, Michigan.

“A Horticulturist’s View of Southern Brazil” — G. C. Klingbeil, Extension Specialist, Fruit Production, University of Wisconsin.

### Apple Contests

#### A Part of Annual Convention Plans

The plate and apple box contests will again be a part of the annual convention being held in Madison, Dec. 1 and 2.

Growers are urged to make selections now for both contests. A large participation will assure a large, quality display and bring added attraction to the convention.

The bushel box contest will be conducted the same as last year, except this year growers may use their own containers. The uniform box provided last year received some criticism, so this year the growers own box can be used—and will become a part of the scoring.

Three varieties can be entered in competition—McIntosh, Cortland, and Delicious. The Grand Champion box will be presented to the Governor with the runner-up winners presented to other dignitaries, press, radio and TV people for promotional purposes.

The balance of the entries will be presented to childrens hospitals in the Madison area.

The following score card will be used:

- |                                  |      |
|----------------------------------|------|
| A. General Appearance—40 points. |      |
| Attractiveness                   | 0—15 |
| Packaging Techniques             | 0—15 |
| Freshness                        | 0—10 |
| B. Fruit Quality—90 points.      |      |
| Color                            | 0—20 |
| Size                             | 0—20 |
| Freedom from Defects             | 0—20 |
| Uniformity                       | 0—20 |
| Trueness to Type                 | 0—10 |
| C. Container                     |      |
| Adapability and                  |      |

Attractiveness 0—20

Entries should be brought to the Loraine Hotel before 10 a. m., Dec. 1. Marlon Schwier is in charge.

### Fruit Plate Show

Entries shall consist of a plate of five specimens of the following varieties:

- Class 1—McIntosh
- Class 2—Cortland
- Class 3—Red Delicious
- Class 4—Yellow Delicious
- Class 5—Jonathan
- Class 6—Northwestern Greening
- Class 7—Connell Red and Fireside
- Class 8—Haralson and Prairie Spie
- Class 9—Spartan and Kendall
- Class 10—Any other variety

Fruit will be judged as follows:

Freedom from blemish .....	30%
Uniformity .....	25%
Color .....	20%
Size .....	15%
Form or trueness to type .....	10%

Prizes:

First prize .....	\$3.00 and ribbon
Second prize .....	\$2.00 and ribbon
Third prize .....	\$1.00 and ribbon

The Grand Champion of the show will receive an additional \$5.00 prize plus the grand champion trophy.

All entries must be in place by 10:00 A. M., December 1. Plates and entry blanks will be furnished.

Many orchards have good exhibition fruit this year. Plan now to make an entry in a number of the above classes.

Professor George Klingbeil is in charge of the plate show.

Fresh fruit and vegetables, flown in several times weekly were a highlight of the U. S. exhibit at the International Hotel and Catering Exhibition in London recently. It emphasized that our products can be successfully flown in for European consumption. Strawberries were one of the more popular items.

### Ladies Program

A fine program has been planned for the ladies at the convention.

Luncheon with a Style Show at Manchester's Madison Room at 11:45 on Thursday immediately followed by a tour through the Madison Art Center. The featured exhibit is "Aaron Bohrod: A Retrospective Exhibition, 1930-1966." Bus transportation (for a small fee) has been arranged.

Apple Dessert Time: 4:30 Thursday. Bring your apple desserts, with the recipe, to the Hotel when you register so they can be judged. Prizes will be given.

Door prizes will also be given again this year. A short business meetin, (including election of officers) will be held during the luncheon.

### Hotel Rates

For your convenience, the Loraine rates are listed below. To avoid later disappointment, reserve your room now. Early birds will have the opportunity to register Wednesday evening.

#### HOTEL LORAINÉ Madison, Wisconsin ROOM RATES

Room for One Per Day:

\$4.75 — \$5.75 — \$6.00 — \$8.00 —
\$8.25 — \$8.50 — \$10.50.

Room for Two Per Day:

Double Bed — \$8.50 — \$8.75 — \$12.00
\$12.50 — \$13.00. Twin Beds — \$12.00
— \$12.50 — \$13.00 — \$14.00 — \$15.00.

SUITES (Twin bedroom and parlor) — \$28.00. All rooms with private bath.

If requested reservations are sold out, next higher will be confirmed.

Reservations held until 7 P. M. unless otherwise instructed.

Above rates subject to 3% State Tax.

## Pansy Spot on Apples

CHUCK KOVAL

Extension Entomologist

Some of the skin blemishes found on apples at this time of the year might be an insect caused condition known as pansy spot. Pansy spot refers to a discoloration of the skin of apples, particularly on McIntosh and Spartan varieties, with Red and Golden Delicious also apparently susceptible. This discoloration is restricted to the skin and appears as an irregular white to pale green area which often resembles the shape of a pansy flower, hence, the name pansy spot.

Pansy spot has been shown to be a reaction of the apple to egg punctures of thrips. The egg punctures are made in the fruit very early in the season, as soon as the dense pubescence is off the fruit in early June.

Pansy Spot is not something new as it has been recognized as thrips injury since 1921. A recent research paper by H. F. Madsen and I. D. Jack of the Research Station, Summerland, British Columbia, entitled, "The Relation of Thrips to Pansy Spot on Apples," confirms previous reports of thrips injury to apples (Can. Ent. 98: 903-908, 1966). Earlier reports of other researchers indicate that thrips injury to flower parts causes blossoms to drop resulting in a lowered fruit set. Madsen and Jack did not report any blossom drop to occur.

Thrips responsible for pansy spot feed on a wide variety of flowers, including: dandelions, elderberry, mustard and wild rose. They overwinter on a number of weedy plants and migrate to fruit trees from the surrounding vegetation early in the spring. Migration to apples occurs during the early prepink stage. The thrips force themselves into young flower buds to feed and begin egg-laying. This early damage to pistils, stamens and calyx lobes of the flowers undoubtedly causes some loss of blossoms. After petal fall most of the adult thrips

leave fruit trees for other flowering plants leaving the young behind to feed on the calyx and of the young apples. Most severe injury occurs when the young nymphs mature and lay eggs before leaving the apples.

Thrips can be extremely difficult to see in the orchard as they are very minute, slender, agile insects, less than one-eighth inch in length. Adult thrips tend to fly with the slightest disturbance while the young nymphs usually remain hidden within the flower parts. When seen, adult thrips are readily recognized by their feathery wings which look like four chicken feathers extending from the body.

It is very probable that pansy spot could be found in any part of Wisconsin. However, injury of this type is easily overlooked or masked by other surface injuries. There are probably three main reasons why pansy spot has not been reported in Wisconsin up to this time. First, most thrips are flower feeders and live on the nectar and pollen found in the flower. By the time fruit formation has progressed far enough for injury to occur the thrips have moved on to new hosts. Secondly, in most orchard blossoms loss due to thrips feeding and oviposition would probably be inconsequential. The third reason is that insecticide applications at petal fall satisfactorily control the thrips before injury to fruit can occur. Pansy spot results from thrips egg punctures made shortly after petal fall.

Pansy spot further emphasizes the importance of the first after bloom spray. The petal fall insecticide application is the most important single insecticide application made in the orchard during the season.

---

You can damage good shears and scissors if you use them to cut cardboard, heavy cord, and wire. Avoid cutting over pins, and never use shears or scissors for prying—you can bend or break the joints.



Mrs. Mary Ann Allen

## New Home Economist

The Wisconsin Department of Agriculture has a new Home Economist in their Marketing Division. Mrs. Mary Ann Allen assumed her duties on October 3. A native of Racine, Wisconsin, Mrs. Allen attended the University of Wisconsin where she received her Bachelor of Science and Master of Science Degrees in Home Economics. For the past year she has been employed as a Home Economics Agent in Sawyer County.

Mary Allen is the former Miss Mary Ann Hasenbach. She was born and raised in Racine, Wisconsin and attended William Horlick High School.

Mrs. Allen's husband is a graduate student at the University of Wisconsin, working toward a Ph. D. in Organic Chemistry.

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A. Wayne Cole

## Wayne Cole Receives Appointment

Wayne Cole has been appointed to an extension position in the Department of Horticulture at the University of Wisconsin. He did his undergraduate work at Mississippi State University, graduating with a B. S. degree in horticulture in 1962.

Graduate work including a dissertation on the effects of 2, 4-D on growth, yield and metabolism of some susceptible crops was completed in January, 1966, at Iowa State University in Horticulture and Plant Physiology.

His responsibility at the University of Wisconsin will be to conduct an extension program on the safe use of pesticides with particular emphasis on herbicides and plant growth regulators. This will be a state-wide educational and demonstration program on the safe, effective, and necessary use of chemicals for more efficient production, handling, and storage of horticultural crops. He will be cooperating closely with other extension specialists dealing with other

phases of horticulture as well as with research personnel studying the use of chemicals on horticultural crops. In addition, his activities will be closely coordinated with others in the College of Agriculture who have responsibilities in one or more aspects of the over all agricultural chemical field in order to help insure continued efficient production of high quality produce in the state of Wisconsin.

---

## Red Cherries Fade During Processing

Everybody likes nice red canned cherries. But when cherries are canned and sterilized, some of the bright red color pigment is lost.

Food scientists J. Von Elbe and K. G. Weckel at the University of Wisconsin, are trying to solve the problem of color loss from canned cherries. They haven't stopped the loss of red color, but they have isolated the materials that give cherries their color. When they identify the chemical nature of these materials, they hope to be able to develop a process to retain it better during canning of cherries.

Study of color loss involves study of commercial sterilizing processes which cause the problem. Some canning processes are 40 years old, and the times and temperatures now used that were set years ago may over-process the cherries and cause loss of some of the color pigment.

Spoilage of canned cherries usually is due to heat resistant yeasts which are normally found on cherries. Weckel and his associates are testing heat resistant strains of yeasts to find out what heat process conditions are necessary to get sterility in canned cherries. Temperature and the processing time might be reduced enough to kill the organisms but not destroy the color.

(Continued on page 13)

## Fall Marketing Prospects

The apple marketing season is from  $\frac{2}{3}$  to  $\frac{7}{8}$  completed pushed by prospects of cold weather as of October 10th. A record crop is anticipated according to growers' reports of yield, but U. S. D. A. estimates indicate 1,600,000 bu. for Wisconsin for this date.

Demand is moderate on smaller sizes and strong on large sized quality pack at this time. Except for early strong opening, demand has been slow. Prices were strong at the season's start and have weakened slightly each successive week during the harvest.

Varieties moving in large volume on to the fresh apple market are Jonathan, Cortland, McIntosh and Delicious.

Apples in general have been well colored in most areas of Wisconsin with approach of cool weather. Roadside marketing has been very good with high prices for quality products. A smaller

volume of apples have been moving into the processed channel due to a limited number of processors and the low price.

Reports from areas east of Wisconsin indicate a smaller total production. Even with this eastern situation of short supply, buyer resistance is strong to medium prices in Wisconsin.

The success of holding the apple market at a satisfactory level of strong prices will depend on each individual apple seller. With growers producing quality fruit, a seller must keep abreast of situations, knowing prices, and making inquiries before making a commitment to hold prices at satisfactory levels through the year. More and more growers are turning to cold storage during harvest so they can market apples the year round.

— John Polich  
Marketing Specialist  
Wis. Dept. of Agr.

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## 1965 APPLE PICKING PRODUCTIVITY STUDY \*

An extensive study of the efficiency and productivity of apple pickers in Michigan orchards was conducted last fall under the guidance of Dr. Donald J. Ricks, MSU Agricultural Economist, to determine typical apple picking productivity rates under a range of orchard conditions and by various types of workers. The study, conducted in over 30 orchards located throughout major Michigan apple producing areas, included 685 workers picking in 208 different orchard blocks. Some workers picked in groups such as couples or a family group.

A wide range of apple picking productivity was observed. The highest picking rate was obtained by several men who were highly motivated, experienced workers and were picking semi-dwarfed trees with moderate to high yields of large fruit. The lowest observed productivity rate was obtained by a woman, who, according to the numerator's notation "visited most of the time."

The upper 10% of the pickers, based on gross hours spent in the orchard, had picking rates of 15.9 bushels per hour or more, while the lowest 10% of the workers picked 4.8 bushels per hour or less. When the number of hours of actual work time was used as a measure of time, the upper 10% of the productivity observations included rates of 20 bushels per hour or more while the lower 10% involved productivity rates of 6.7 bushels per hour or less. In general, the higher rates of productivity were obtained by highly motivated and capable individuals working under favorable orchard conditions.

Fifty percent of the worker-orchard observations involved productivity rates of 9 bushels per hour or more (with time measured by the number of gross hours spent in the orchard). With the same

measure of time, the upper 25% of the observations showed rates of 12 bushels per hour or more while the upper 75% involved rates of 6.6 or more per hour. By contrast, when time was measured by the numbers of hours actually worked, the top 50% of the pickers harvested 11.3 bushels or more per hour.

Comparison of productivity rates based on the two measures of time indicates productivity rates per gross hours spent in the orchard tend to be 20 to 30% less than productivity rates per hour of actual work time. In the case of the lowest 5 to 10% of the productivity observations, rates per gross hour in the orchard were 30 to 35% lower than the productivity rates per hour of actual work time.

Ricks found male pickers tended to have higher average productivity rates. Productivity was lowest for workers under 18 and over 50 years of age and was greatest in the age category of 26 to 40 years.

The workers in the highest motivational category had average productivity rates which were almost double those in the lowest motivational category. The study indicated that motivation has a greater effect on worker productivity than does any other single worker characteristic. Experience was associated with higher worker productivity rates.

Categorizing workers as to residency, Ricks found out-of-state migrant workers had average productivity rates higher than those of either the local or in-state migrant workers.

Tree height and yield were important orchard characteristics affecting the picker's productivity. The observed picking rate for trees on standard root stock was 9.6 bushels per hour versus 11.3 for dwarf and semi-dwarf trees. When trees were grouped by height, the picking rate was 11.5 bushels per hour for trees 8 feet or less in height, 10.2 bushels per hour when tree height was 9 to 13 feet, 10.2 bushels per hour for

trees in the 14 to 18 foot category and 9.1 bushels per hour when trees were more than 18 feet high.

The study indicated no significant differences in productivity rates between spot picking and strip picking. However, in this study only 5 to 20% of the fruit was left on trees where spot picking was observed.

Higher average productivity rates were associated with orchards where the highest degree of picker supervision was practiced. Surprisingly, average productivity rates were higher where apples were being picked for immediate fresh market sale than for processing.

Piece work payment rates (including bonuses) range from 17¢ to 34¢ per bushel. Most common rates were 20 and 25¢ a bushel. Only one grower, however, paid a rate of less than 20¢ a bushel (including any bonus). Ricks study showed 50% of the workers realized average earnings of over \$2 per hour picking apples. More than 95% earned over \$1 per hour. These hourly earnings are cash payment earnings (including bonuses) but do not include any allowance for value of housing, transportation, or other non-cash benefits provided by the employer.

---

\*From Agricultural Economics Report No. 41 by Dr. D. J. Ricks, Michigan State University, East Lansing, Mich.

## THRIPS IN STRAWBERRIES

CHUCK KOVAL

Extension Entomologist

Fruit deformity in strawberries, most frequently referred to as "catfacing", has been attributed to many causes over the years. Most important of these are insects, adverse weather conditions and lack of pollination. Of the insects associated with "catfacing", lygus bugs and thrips have been reported causing fruit deformity.

Lygus bug injury and poor pollination look very much alike on strawberries. However, lygus feeding frequently causes complete flower blasting. Thrips do not cause flower blasting, but rather a withering of the flowers resulting in low quality fruit.

High populations of thrips are certain to cause some "catfacing". The most serious damage of thrips is the discoloration of the berries. Large numbers of thrips feeding over the entire surfaces of berries results in a golden brown discoloration of the fruit. Relatively few thrips feeding can be noticed by whitened spots on the fruit.

Thrips are certain to be a more serious problem on everbearing strawberries than they would usually be with standard varieties. On standard varieties thrips do not have the opportunity to reach high populations because harvest is generally completed by midsummer. However, with everbearing varieties there is a continual supply of new flowers for the thrips to utilize as food sources and as reproductive sites. With the continual availability of host material, thrips populations can continually increase if left unchecked. Furthermore, the hot weather of late July and August is favorable for maximum thrips development. Serious thrips problems on everbearers would probably occur about mid-August in most areas of Wisconsin.

Growers of everbearing strawberries may find it necessary to apply insecticides more often than was necessary with standard varieties. Not only do most insects foster under the warmer weather conditions of late July and August, but persistent insecticides cannot be used in conjunction with harvesting operations of everbearing strawberries. Although very effective, insecticides which can be used in an everbearing strawberry operation control insects for only a few days and must be reapplied at frequent intervals.

## OCTOBER IN THE ORCHARD

G. C. KLINGBEIL

Extension Specialist, Fruit Production  
The University of Wisconsin

The harvest season is over and for most growers it was fairly successful. Fruit in storage should be checked frequently to determine its condition; the loss of fruit after several months of storage is costly.

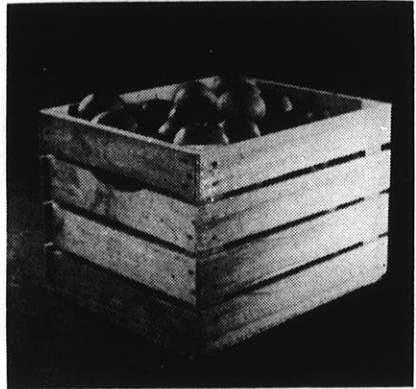
A few reminders are generally in order at this time of the year. Repair ladders and crates before putting them into storage sheds. Be certain to drain sprayers and tanks of liquids that will freeze solid: rarely a year goes by when an engine isn't lost for this reason. It's also wise to oil or grease any parts on the sprayer or other equipment that may rust before its next usage which may be next spring. It goes without saying that left over chemicals should be stored properly. All chemicals must be stored where they are safely away from children and animals. Wettable powders must be kept in a dry storage and any liquid forms must be stored where they will not freeze. This past year there were several instances of poor results from spraying due largely to the fact that liquid chemicals had been exposed to freezing temperatures causing them to deteriorate.

There has been an increasing amount of oyster shell and San Jose scale observed in orchards this season. Both have been serious enough to have occurred on fruit. Generally, the first place to look for these pests is in the top center of older trees. Growers finding scale in their orchards should consult their county extension office or extension entomologist at the College of Agriculture in Madison for the best control measures.

Another reminder about mice: some areas have heavy cover and mulch in orchards, ideal habitat for meadow mice

(Continued on page 18)

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## Red Cherries — from page 8

Artificial color in cherries is permitted by law in Wisconsin, but such a procedure is not generally used for canned cherries because federal regulations do not allow artificial coloring.

The researchers hope to develop from their studies a process whereby the cherries have better color and are easily processed.

—University of Wis. Experiment Station

## Aid for the Beekeepers

Beekeepers with a large number of colonies may soon be spared some heavy lifting.

B. F. Detroy, agricultural engineer and Floyd E. Moeller, apiculturist with the U. S. Department of Agriculture working at the University of Wisconsin, have been experimenting with a vehicle for use in the bee yard, which takes much of the hard manual labor out of lifting and moving heavy colony units.

Since few bee yards are located close to an electric power supply, Detroy and his co-workers decided to try a vehicle with a number of pieces of auxiliary equipment.

The vehicle, still in the experimental stage, looks much like a pick-up truck. It has a 4-wheel drive to aid maneuverability in case of adverse weather conditions. It also has a power take-off, governor, tachometer, and heavy duty axles. Auxiliary equipment includes a boom, air compressor, electric generator and hydraulic system.

## Minnesota Winter Meetings

According to Mr. Thor Amodt, the new Executive Secretary of the Minnesota Fruit Growers Association, the winter meetings will be December 12 and 13 at the Kahler Hotel, in Rochester, Minn. Dr. Betjer of Wenatchee, Wash. will be the featured speaker.

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## Physiology of Dieldrin Poison Studied

The insecticide dieldrin comes under much criticism because it is a chemical that does not break down to harmless products either in the insect body or in the soil. It may have lasting residual effect. Insect resistance to such a chemical is highly important, but almost nothing is known about the mechanism of resistance or susceptibility of insects to dieldrin.

Two University of Wisconsin scientists, F. Matsumura and M. Hayashi are trying to find out how resistance to dieldrin works in mosquitoes. Geneticists know how resistant insects survive through selection, but they don't know how dieldrin resistance actually works.

Matsumura and Hayashi studied resistance in two different ways. First they exposed non-resistant and resistant mosquito larvae to varying amounts of the dieldrin, and they found that resistant strains picked up twice as much dieldrin as susceptible strains did.

Then they determined how the chemical combined with the insect's body tissue. To study this they ground heads of mosquito larvae into a fine mixture and then added dieldrin to it. They found that there was a chemical binding of dieldrin with nerve tissue of the insect. This is similar to the mechanism by which DDT kills. They discovered tissue from resistant mosquito strains had less combining ability with dieldrin.

This suggests that the poisoning effect of dieldrin is by actual physical combination of dieldrin with insect nerve tissue. Since resistant mosquitos do not bind as much dieldrin with their nerve tissue, they remain normal longer and are able to absorb more of the chemical, the scientists reason.

Some research results in other places do not fully agree with this theory, but Matsumura and Hayashi think they have

established how dieldrin poisoning works. This is the important starting point for further study of the whole whole problem of chemical poisoning in animals.

—University of Wis. Experiment Station

## Malathion May Be Safe For Humans

Pesticides are poisonous to man in varying degrees. Studies have shown that the more easily an organism can eliminate or breakdown an insecticide, the less poisonous the chemical is to the organism. Scientists have observed this tendency more often and consistently in highly selective insecticides than in non-selective ones.

Fumio Matsumura and C. T. Ward, insect specialists at the University of Wisconsin, studied the breakdown of malathion, carbaryl (Sevin) and parathion by human and rat livers. Malathion and Sevin are well known insecticides. Parathion is non-selective.

They introduced the three insecticides to rat and human liver samples. They found that human liver samples could eliminate over 95 percent of malathion, 10 to 20 percent of Sevin, and 10 to 17 percent parathion. The livers broke down malathion fastest, followed by Sevin and parathion. Rat livers eliminated the insecticide in the same order, showing a similar pattern of degradation.

Matsumura and Ward found no relation between ability to eliminate the chemicals and age, sex, cause of death, age of sample after death, and freeze-storing period of each liver sample. However, in one case with Sevin, liver samples from male patients appeared to degrade the chemical faster than those from females.

They conclude that if the degree of degradation in the liver is taken as a measure of insecticide toxicity, then malathion is a very safe insecticide for humans to use.

—University of Wis. Experiment Station



## Farms to Lose Million Acres by 1980

Wisconsin will be farming a million fewer acres of land in 1980 than it is farming today, according to estimates by two University of Wisconsin agricultural economists.

The loss of farmland will leave some 20 million acres of land still in agricultural production in 1980—a decrease of about 5 per cent. A million acres may seem a lot, but it is about equal to the agricultural acres bought between 1955 and 1960 by the Wisconsin Conservation Needs Committee.

The million acres that will come out of agricultural production in the next 15 years will go mostly into recreational areas. Some of the acreage will also go into city development, airports, and roads.

The Wisconsin farm economists, Roger Johnson and William Saupe, say that most of the land removed in the next 15 years will come from the heavily populated southeastern area of Wisconsin. About 375,000 acres will be converted in Milwaukee, Racine and Kenosha Counties.

Another 205,000 acres will be removed from 16 of the northernmost counties of Wisconsin—mostly for recreational purposes. Other areas of the state will lose only small bits of land from agriculture.

Five southwestern counties, traditionally rural, will remain so with only about 32,000 acres of farm land going out of agricultural use in the next 15 years.

Breaking down specific uses of the land removed from agriculture, Johnson and Saupe say that 72 per cent will be used for state recreational areas, 16 per cent for city expansion, 10 per cent for highways and 1½ per cent for federal projects.

Although in 1980 there will be fewer total farms, there will actually be an in-

(Continued on page 18)

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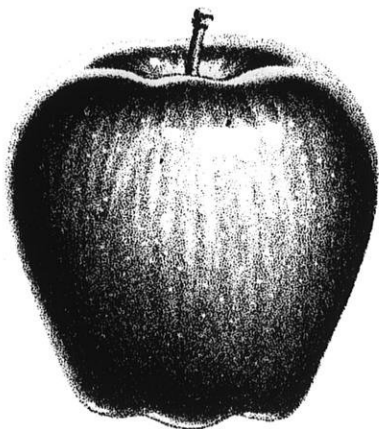
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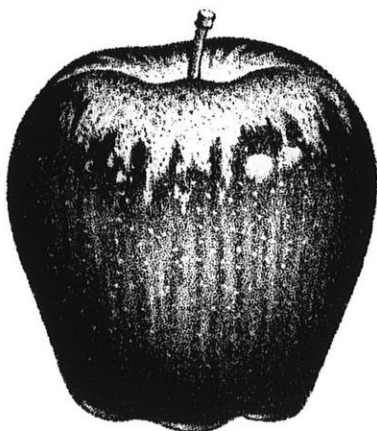
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# OR OTHERWISE

## FARMS

(Continued from page 16)

crease in the number of non-commercial farms, say the economists.

They estimate that two and one-third million acres or 11 per cent of the total farmland in 1980 will be operated by 26,000 non-commercial farmers compared to 24,000 non-commercial farms today. They classify non-commercial farms as those that are farmed part-time, are in semi-retirement or are abnormal in some other way.

Johnson and Saupe also point out that in 1980 there will be fewer commercial farms, but they will be larger in average size just as they have been getting bigger since 1940.

--University of Wis. Experiment Station

## October in the Orchard

(Continued from page 12)

and difficult or expensive to bait. Many growers are using rotary mowers and other devices to knock down the cover which will discourage buildup of mouse numbers. May I call your attention to the suggestions on mouse control that appeared in last month's issue. Deer are not considered rodents but in many orchards they do more damage than mice. According to a recent report from the Department of Fisheries and Game officials ordinary moth balls, (naphthaline), enclosed in mesh bags with metal hangers, have been effective as a deer repellent when suspended on apple trees or strung on lines encircling the orchard. Reports are that it is at least 75 percent effective. Growers might try this where deer have been a serious problem on young trees.

## DROP - OUTS

An estimated 604,000 Americans 14 to 24 years old dropped out of school before completing high school during the 12 months prior to October, 1964, a study by the Census Bureau shows.

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# Horticulture

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## Highlights of Wisconsin Apple Convention

The 98th annual convention of the Wisconsin Apple and Horticultural Council met at the Hotel Loraine in Madison, Wis., Dec. 1 and 2, with the largest attendance in years. The theme was, "Tools for Profit."

Speakers and their subjects were:  
Dr. R. Spitzer — "A Climate for Profit Tomorrow."

William Kasakaitas — "Legislative Proposals Affecting Fruit Growers."

Chan Copps — "Merchandising Fresh Fruits and Vegetables."

Fred Hasler — "Michigan Apple Commission."

John Schmidt — "Agricultural Re-

cords as an Aid to Greater Fruit Profit."

George Klingbeil — "Horticulturist's View of Southern Brazil."

Dr. A. E. Mitchell — "New Practices—Spraying."

Rev. J. E. Kalas — "As American as Apple Pie."

Gerald Verbridge — "National Apple Picture."

The Applemen's Banquet was one of the major highlights of the conference with Mrs. Mary McBride as guest speaker. Ag Honorary Awards were made to Walter Clemens, Sr. Award, and Henry Mahr, Jr. Award.

The apple variety display and the State Department of Agriculture and commercial exhibits were observed by convention-goers.

(Continued on page 10)

## IMPORTANT NOTICE

Mrs. Nancy Knight, after the sudden death of her husband, will be unable to continue as Executive Secretary of the Council and Editor of WISCONSIN HORTICULTURE. Her resignation is effective February 1st. The Board of Directors has decided to discontinue publishing WISCONSIN HORTICULTURE until further notice.

Any queries regarding Wis. Apple and Horticulture Council membership or other affairs should be addressed to President, Mr. William Meyer, Gays Mills or his wife, Marlene, of Gays Mills, who has temporarily taken over as secretary-treasurer.

All apple promotional materials will be handled by Board member, Jack Rasmussen, Rt. 4, Oshkosh, Wis. 54901.

# WISCONSIN HORTICULTURE

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(Mrs.) Nancy Knight - Executive Secretary and Editor  
5514 Dorsett Drive, Madison, Wis. 53711 Phone 233-9359

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## Coming Events

### REGIONAL FRUIT GROWERS

#### MEETINGS

##### Tree Fruit

**January 31** — Sturtevant (extension building)

**February 1** — Waukesha (courthouse)

**February 2** — Sheboygan Falls (com-

**Feb. 7 & 8** — The Annual Meeting of the Wisconsin Fertilizer Assn. at Holiday Inn No. 2, in Madison. An extremely fine program has been planned.

munity building)

**February 28** — Fort Atkinson (city hall)

**March 2** — Gays Mills

##### Strawberry

**March 14** — Waukesha

**March 15** — Green Bay (YMCA)

**March 16** — Chippewa Falls (court-house)

## 1966 Apple Show Plates

### Class I — McIntosh

1. Emil Beyer, Rt. 1, Box 61, Malone, Wisconsin
2. Sam Schwartz, Amy Belle Rd., Colgate, Wisconsin
3. Barthel Fruit Farm, Mequon, Wisconsin

### Class II — Cortland

1. Emil Beyer, Rt. 1, Box 61, Malone, Wisconsin
2. William Meyer, Kickapoo Orchard, Gays Mills, Wisconsin
3. Barthel Fruit Farm, Mequon,

### Class III — Red Delicious

1. Wm. J. Louis, Rt. 2, Richland Center, Wisconsin
2. Oakwood Fruit Farm, Richland Center, Wisconsin
3. John W. Louis, Rt. 2, Richland Center, Wisconsin

### Class IV — Yellow Delicious

1. Barthel Fruit Farm, Mequon, Wisconsin
2. Rasmussen Apple Acres, 3871 Omro Rd., Rt. 4, Oshkosh, Wisconsin
3. Emil Beyer, Malone, Wisconsin

### Class V — Jonathan

1. Emil Beyer, Malone, Wisconsin
2. Sam Schwartz, Amy Belle Rd., Colgate, Wisconsin
3. Rasmussen Apple Acres, 3871 Omro Rd., Rt. 4, Oshkosh.

### Class VI — Northwestern Greening

1. Art's Orchard, Art Sukowatey, Rt. 2, Waunakee, Wisconsin
2. Mm. Meyer, Gays Mills, Wis.
3. Walter H. Clemens, 10813 N. Port Washington Rd., 13W Mequon, Wis.

**Class VII — Connell Red**

- 1. H. J. Hasslinger, Moose Lake Orchards, Nashotah, Wis.

**Class VIII — Haralson & Prairie Spy**

- 1. Walter H. Clemens, 10813 No. Port Washington Rd., 13W Mequon, Wisconsin
- 2. Wm. Meyer, Gays Mills, Wis.
- 3. Henry Mahr, Oak Creek, Wis.

**Class IX — Spartan**

- 1. Barthel Fruit Farm, Mequon, Wisconsin
- 2. H. J. Hasslinger, Nashotah, Wis.
- 3. Sam Schwartz, Amy Belle Rd., Colgate, Wisconsin

**Class X — Any Other Variety**

- 1. Frank Orchard, Inc., Gays Mills, Wisconsin
- 2. Emil Beyer, Malone, Wisconsin
- 3. Sam Schwartz, Amy Belle Rd., Colgate, Wisconsin

**Grand Champion — Northwestern Greening:**

- Art's Orchard, Art Sukowatey, Rt. 2, Waunakee, Wisconsin

**Reserve Champion — Connell Red:**

- H. J. Hasslinger, Nashotah, Wis.

**BUSHEL BOX CONTEST WINNERS**

**Champion Delicious:**

- Oakwood Fruit Farm, John and William Louis, Richland Center.

**Champion McIntosh:**

- Frank's Orchard, Sherman Frank, Gays Mills, Wisconsin

**Champion Cortland:**

- LeRoy Meyer, Oak Creek, Wis.

**Grand Champion:**

- Oakwood Fruit Farm, John and William Louis, Richland Center, Wisconsin. (Score of 280 of a possible 300).

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- FIRST—Mrs. Art Bassett, "Johnny Apple Cake" ..... \$4.00
- SECOND—Mrs. Joe Strack—"Apple Date Cake" ..... \$3.00
- THIRD—Mrs. John Bernes—"Apple Torte" ..... \$2.00
- FOURTH—Mrs. Ten Eyck—"Spicy Apple Bars" ..... \$1.00

**Resume of the 1966 Apple Marketing Season**

The national apple crop for 1966 yielded 129,500,000 bushels, as compared to a 1965 production of 139,760,000 bushels. Wisconsin and Minnesota crops were greater than last year.

The pre-harvest period in the Wisconsin-Minnesota area showed demand high, partly due to a slump in production in the east and south. As the harvest season began, a strong demand for fresh apples from buyers was indicated by growers and calls to the Wisconsin Department of Agriculture as to available apples. Due to the highest prices in 10 years and the demand situation, Dudleys, Wealthys and McIntosh moved into market channels earlier than usual, in sizeable quantities but immature. Supplies began to build up because the immature fruit didn't sell and the bottom fell out of the market in Minneapolis.

Is the grower, buyer or consumer to blame for this harvest market condition? Why shouldn't the grower sell when demand and prices are strong? Why shouldn't the buyer satisfy his consumers and make a good profit with early apples? Is it right for the consumer to ask so early—where are the apples? Is this a contributing factor to lower prices during the remainder of the harvest season and a partial loss of consumer appetite for apples due to immature fruit?

What were some other contributing factors to make the market season troublesome? One factor was a Minnesota crop four times larger than last year and an anticipated Wisconsin crop above last year. Were there extreme price concessions due to continued poorly-colored fruit on the market?

(Continued on page 10)



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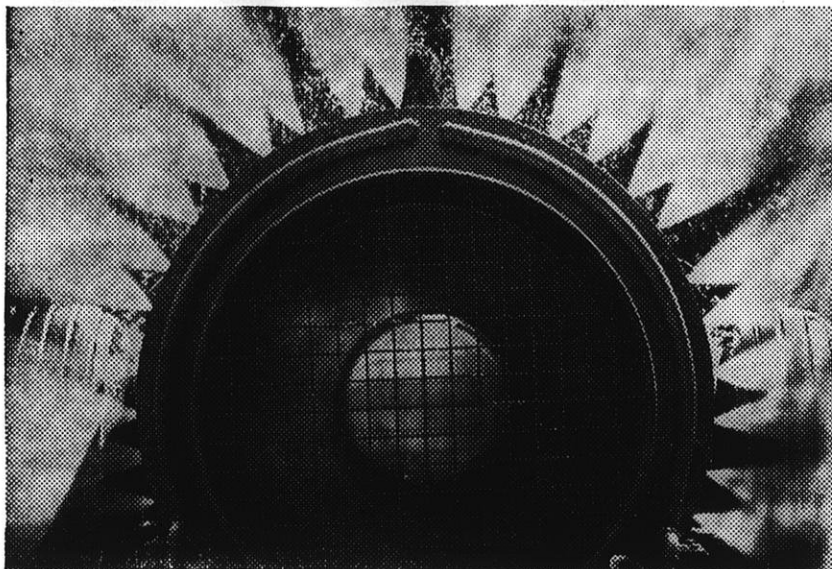
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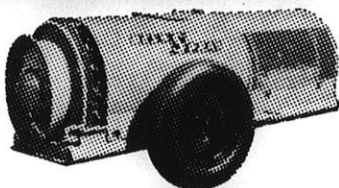
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## C A Storage Principles And Regulations

G. E. Klingbeil and W. E. Simmons \*

A number of inquiries has prompted a review of the subject. We will discuss the principles and regulations that have resulted.

Controlled atmosphere in fruit storage is not new. The principles were developed in England beginning in the late 1920's where it was known as gas storage. One of the first things done in this country was to change the name of the procedure to controlled atmosphere (CA) or modified atmosphere (MA). The first CA apple storage rooms in this country were built in New York state primarily to extend the storage life of the McIntosh variety. Today, such storage facilities have been constructed in many of the major apple producing regions of the country.

All living things carry on a process called respiration and apples are no exception. In respiration, sugars are oxidized (burned) in the presence of oxygen with water vapor and heat being produced. The faster the respiration; the more rapidly the fruit deteriorates. The rate of respiration can be reduced by several methods: The first and most common is to lower the temperature; the second is to reduce the supply of oxygen around the fruit; and a third is to increase the amount of carbon dioxide. All three are used in CA storage. Normal air in the atmosphere is made up of about 78 per cent nitrogen, 21 per cent oxygen, .03 per cent carbon dioxide, and a small amount of other inert gases. The recommended atmosphere for McIntosh is 2.5 per cent carbon dioxide the first month and

5 per cent thereafter, 3 per cent oxygen at 38° F and a relative humidity of 90 per cent.

In order to successfully maintain a controlled atmosphere storage, sound storage, engineering and operating procedures must be rigidly followed. The room must be essentially free of gas leaks; it must be properly filled and sealed; refrigeration units for cooling and equipment for providing and maintaining proper oxygen and carbon dioxide levels must function properly; and special equipment for maintaining humidity, proper pressure and clean air must be provided.

Controlled atmosphere storage for apples has provided improved quality fruit of many varieties far beyond their normal storage life, has lengthened the marketing period and has provided a means of more orderly marketing. Fruit stored by such methods requires special designation which in most cases comes under certain regulatory practices which may vary from state to state.

At the present time there are twelve states that have regulations for certified controlled atmosphere apples. These states are: Connecticut, Main, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Pennsylvania, Virginia, Washington, California, and Idaho.

In addition to these twelve states, nine other states have either cold storage or chemical treatment requirements or both governing the interstate shipments of fresh apples.

There is very little uniformity between states in any of these various requirements. There is a certain amount of reciprocity between states. However, since Wisconsin does not have any statutes or regulations covering controlled atmosphere, cold storage, or chemical treatments for fresh apples, it is impossible for it to enter into reciprocal agreements with these states.

\* Associate Professor of Horticulture, University of Wisconsin and Port Entomologist, Wisconsin Department of Agriculture, respectively.

Growers, shippers, transportation agents, truckers, and others concerned in interstate movement of plants, plant products, and other materials subject to federal and state regulations on account of plant pests may obtain information by contacting:

Wis. State Dept. of Agriculture  
Plant Industry Division  
Hill Farms State Office Bldg.,  
4802 Sheboygan Avenue  
Madison, Wisconsin, 53702  
Phone: 266-2295

## Pesticide Form Affects Runoff

The chemical form in which a pesticide is applied to fields may greatly influence how much of it is washed off the soil during rainstorms, ARS scientists in Georgia have learned.

In their tests, agricultural engineer A. P. Barnett, agronomist E. W. Hauser and soil scientist A. W. White found that as much as 27 percent of the herbicide 2, 4-D in the ester form washed away, while only 3 per cent

of 2, 4-D in the amine form was lost.

An amine forms a solution with water, the scientists explain, but an ester is relatively insoluble and forms an emulsion. The more soluble amine penetrates the soil. Because the ester remains nearer the surface, it is more susceptible to washoff.

Working in cooperation with the Georgia Agricultural Experiment Station at Watkinsville, the researchers applied artificial rain. They then trapped the soil-and-water mixture that ran off the slope of the field and tested the washoff for 2, 4-D content.

Most 2, 4-D loss occurred in the first 30 minutes of rainfall. Rainstorms of this duration occur frequently during the spring and summer in the Southeast.

The test plot soil, a sandy loam typical of 22 million acres of arable land in the southern Piedmont region, was fallowed before the tests and harrowed parallel to the slope to promote maximum washoff of chemicals.

—U. S. Dept. of Agr.



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## CONVENTION — from page 1

Grand Champion Winners in contests were as follows:

Bushel Box — William and John Louis Orchard.

Plate — Art's Orchard.

The Grand Champion Bushel was presented to Governor W. Knowles.

The Women's Auxiliary provided apple desserts and punch, and had an apple recipe contest for the orchard ladies.

The Wisconsin Department of Agriculture and University of Wisconsin Department of Horticulture aided the Wisconsin Apple and Horticulture Council to plan and present the state convention.

A business meeting and election of new officers completed the convention. Officers elected for the coming year were:

President — William Meyers

Vice President — LeRoy Meyers

Secretary-Treasurer—To be decided at later date.

Directors — Jack Rasmussen, Robert Sacia, Fred Meyers, John Louis.

John Polich

Marlon Schwier

Marketing Division

Wis. Dept. of Agriculture

## '66 APPLE SEASON — from page 3

The move to the new package 12/4's looks sound but did it lower the prices of the 10/4's? Further, did the 1/2 package act as a loss leader? Are these packages necessary? Did sale of small-sized fruit of 2" hurt the high-quality market, and could a good processing plant (at fair prices) be an outlet so only high-quality fruit reaches the market fresh? Is there a need for better grading?

Buyers are looking for orderly marketing of apples. We can't expect

buyers to take all apples in a 2 to 3 months period and then look elsewhere for supplies. Can the grower provide good storage to even out the market season and prevent depressed prices at harvest? Maybe due to the press of harvesting, growers must rely on a good broker to sell his product. Possibly, orderly marketing would allow chain stores to make a smaller markup on fruit—or do chain stores want good markups?

As the market season progressed, season movement was sluggish and prices 50¢ to 70¢ under anticipated levels.

Can many of the problems of the marketing season be solved by greater grower unity and closer cooperation and communication with processor and buyer, with assistance of the Wisconsin Department of Agriculture's Marketing Service?

Let's list some of the major challenges in summary:

1. Is there a need for maturity standards?
2. Is there a need to curb the marketing of low-quality fruits?
3. What are the right packages for industry?
4. How can orderly marketing be improved?
5. Can smaller markup at retail levels make apples noncompetitive?
6. How can we improve communication between grower, buyer and government?

Finally, will Wisconsin-Minnesota apples be marketed more efficiently or do we remain status quo?

John Polich

Marlon Schwier

Marketing Division

Wis. Dept. of Agr.

(Excerpts of speech presented at Wisconsin - Minnesota Convention)



## Apple Viruses

**Earl K. Wade, Ext. Plant Pathologist**

(Much of the information in the following discussion was obtained from a seminar paper prepared by O. W. Barnett, Jr., a graduate student in the Plant Pathology Department, University of Wisconsin.)

Wisconsin apple growers certainly do not hear as much about virus diseases of apples as they about such diseases as scab and fire blight. However, virus diseases do exist in apple stocks, and on occasion have been observed in the state. At any rate, most growers should be interested in the subject, and this is an attempt to summarize very briefly, some of the more important aspects of virus infections in apples, including certain references to apple virus research.

In the 1940's and '50's much work was done in the U. S. on stone fruit viruses, while in Europe more work was done with the pome fruit viruses. As the more important of latent apple viruses was realized in this country, more work was channeled in this direction. Now U. S. workers appear to be concentrating on pome viruses, while European workers are more concerned with the stone fruit viruses.

Considerable European work has been devoted to apple viruses causing symptoms on commercial varieties. The symptoms of several of these virus infections are quite striking, such as Green Crinkle, Apple Ringspot, Dapple Apple, Green Mottle, Russet Ring, Apple Rough Skin, Star Cracking, Apple Proliferation, Apple Rosette, Flat Limb, Apple Rubbery Wood, and Apple Mosaic. The mere descriptive names of these apple viruses gives one an idea as to the types of symptoms produced on the host plant or apple tree.

None of these apple viruses have been mechanically transmitted except Apple Mosaic. The means of natural spread is not known. However, all of them can be transmitted by grafting. The presence of the disease is usually verified by grafting to varieties known to be very susceptible.

Yarwood in 1955, reported the transmission of Tulare Apple Mosaic mechanically to tobacco and then back to apple. Mink and Bancroft in 1962 reported the purification of the virus. However, this virus has been found on one tree only—in California. Its relation to the common Apple Mosaic is doubtful.

R. W. Fulton of the Plant Pathology Department here at the University recently transmitted Paradise Apple Mosaic to several herbaceous hosts and then back to several species of the rose family, including apple. Confirmation of this as the virus of Apple Mosaic awaits transmission of more isolates. Mechanical transmission of viruses serves the same purpose as pure culture work in bacteriology or mycology.

Because of abnormal behavior of the USDA rootstock Spy 227, reports of Rubbery Wood virus latent in English rootstocks, the decline of orchards with Virginia Crab interstocks, and propagation failures on Malling rootstocks started work in the U. S. on latent viruses. A project was started in 1962 to select a reliable minimum woody host range to detect latent viruses and to discover suitable herbaceous hosts for indicators of the viruses.

Mink and Shay of Purdue University in 1962 reported grafting from latent virus sources in many different apple varieties to several indicator plants. They now feel that the number of latent viruses which can be

(Continued on page 12)

**APPLE VIRUSES** — from page 11  
identified is limited only by the number of indicator plants used in indexing.

Several viruses have supposedly been mechanically transmitted from apple. However, recent information indicates that some of the virus isolates may actually be latent viruses already present in the indicator plant rather than having come from the apple host. At least two workers did report in 1964 the transmission of a virus from apple to the indicator plant, *Chenopodium guinoa* and then back to apple. The symptoms on apple were those of chlorotic leafspot.

The spread of apple viruses in the orchard is very slow if at all. On the other hand, root grafting is a hazard in research nursery plots after two or three years in close proximity.

Controlling apple viruses can be very difficult. The infected trees can be cut out or they can be topworked with tolerant varieties. Undoubtedly a better method is to plant stocks indexed as virus-free of known viruses. Heat has been used to free rootstocks and commercial varieties from several apple viruses.

## **FOR FRUITS AND VEGETABLES— Heat Treatment Prevents Decay**

ARS scientists are literally making it too hot for the comfort of decay organisms that sometimes destroy produce before a grower or packer can get it to his customers.

Hot water baths or hot air treatments killed decay organisms on 14 fruits, vegetables, and chestnuts without injuring the commodities in tests at 8 ARS marketing research field stations from Main to California.

Hot water dips also protected Stayman apples and Anjou pears from scald, the unattractive skin mottling that sometimes develops during storage and marketing.

Cantaloups, peaches, mangos, and lemons are being heat-treated commercially, but for most of the other commodities, heat treatments are still experimental. Their advantages must be confirmed under packinghouse conditions before they can be recommended for commercial use.

Potential advantages are impressive—hot water or hot air treatments are cheaper, safer, and easier to use than chemical controls for decay.

Moreover, heat treatments prevent decay caused by organisms that get under the skin, beyond the reach of chemicals.

Under laboratory conditions, heat treatments had no adverse effect on the appearance of the products tested.

As with any decay control, there are precautions and limitations to the use of heat treatments. Good sanitation in the packinghouse is more important than ever, because subsequent contamination of heat-treated products can offset benefits of the treatment.

Serious losses will also result if the water or air temperature is too low or high, or if the commodity is exposed to heat for too long or short a time. Heated air must be close to saturation with water vapor to be effective.

Test results are as follows:

**APPLES**—Good results were obtained with Stayman Winesap and fair to good results with Red Delicious apples that were dipped 1 minute in water at 130 degrees F., to control scald.

**BLUEBERRIES** — A 1- to 2-minute dip at 125 degrees protected the berries from heavy decay loss. Berries exposed to hot (110 degrees), moist air for 30 to 60 minutes also were protected from decay.

**CANTALOUPS**—Melons remained free of mold 12 days after loading in railcars after being treated commercially at a water temperature of 123 degrees for 1½ minutes.

**CITRUS**—Several kinds of decay were prevented when lemons were dipped for 2 to 4 minutes in water at temperatures of 115 to 120 degrees; and oranges for 5 minutes at 129 degrees. Grapefruit was pitted too severely for heat treatment to be profitable.

**CRANBERRIES** — Hot water dips reduced decay by about 50 percent. Dips at 125 degrees for 2½ minutes injured late-harvested fruit but worked well for berries harvested at other times. For late-harvested cranberries, best results were obtained with 10-minute dips at 115 degrees

**PEACHES**—Peach growers in the Southeast have obtained good commercial results with hot water dips at 120 to 129 degrees for 3 minutes. Hot moist air also produced good results at 129 degrees for 10 minutes.

**RASPBERRIES and STRAWBERRIES**—Hot air treatments at 109 degrees for 40 minutes protected berries from decay. Hot water dips for 1 minute at 125 degrees protected red raspberries, but scalded strawberries.

**PEPPERS**—Bacterial decay of bell peppers was reduced about 70 percent by hot water dips for 1½ minutes at 123 degrees. In packinghouse tests, brush-waxer units were contaminated with decay organisms and nullified the benefits of the treatments, thus demonstrating the bad effects of poor sanitation.

**SWEETPOTATOES**—Both hot air (110 degrees for 24 hours) and hot water (120 degrees for 1 minute, or 115 degrees for 5 minutes) protected sweetpotatoes from decay.

Several varieties of precut and whole seed potatoes are being tested at Preque Isle, Maine, and East Grand Forks, Minn. Other field stations are testing hot water or air on chestnuts, figs, mangos, papayas, pears, and tangelos. Tests will be made with additional fruits and vegetables and with other varieties of those already tested.

## Boron & Boron Deficiency

The following article written by Dr. C. Ehlers, Horticultural Agent of Door County, Wisconsin, is taken from the November 1 issue of the **Door County Advocate**. Much of what Dr. Ehlers has outlined applies to many areas of Wisconsin.

G. C. Klingbeil

The highest incidence of boron deficiency on apples observed in perhaps the past decade has been noted this season. This increase can be partially attributed to the drought conditions which prevailed during much of the growing season; a factor recognized for many years as having some association with the disorder. Actually, prior to research findings which established the lack of boron as the contributing cause, the disorder was known as "drought spot."

However, we cannot "pass off" the problem in anticipation of a more nearly normal season in terms of an adequate moisture supply. The appearance of deficiency symptoms this season should be a tip off that we are approaching dangerously low levels of boron, and deficiency symptoms are apt to occur in future years even with a normal moisture supply.

Boron deficiency in the apple fruit is manifest by a condition often termed internal cork. In internal cork, dead cell masses occur within the flesh. The skin of the fruit may appear normal, except when the corky areas are immediately beneath the skin. In such cases, the collapsed cells may cause a slight depression of the skin, and the disorder is quite apparent. This condition is not as readily apparent when the corky areas are deeper in the flesh, and here it may not be evident until the apple is cut open. When outer cells and the skin are involved, the skin may become russeted, especially if the condition develops early in the

(Continued on page 15)

# Lullaby-bye



Now, while  
aphids, mites and  
scales lie dormant—  
cradled in the deep of  
your orchard—blanket  
them with Ethion-Oil.

And count on being rid of  
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Without mixing; Ethion-Oil  
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Without injuring your trees;  
you use reduced amounts of oil.

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FAIRFIELD CHEMICALS • NIAGARA  
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## **BORON** — from page 13

season, and the term "external cork" appropriately describes the condition.

Different apple varieties vary somewhat in the ease of symptom expression as well as the degree. Of our major varieties, Cortland is generally affected first.

Extreme cases of boron deficiency in which rosetting of twigs and twig dieback occurs have been reported from other areas. This condition has not been confirmed as boron induced here.

Fortunately, an economical means of controlling boron-deficiency has been found. Agricultural grade borax can be applied as a separate application or it can be incorporated into the regular commercial fertilizer, thus eliminating one operation. Only a small amount is needed to correct the deficiency condition.

A fully mature tree (25 or more years of age) requires only about one pound of the grade of borax that contains 11.34 percent boron. Younger trees need even less, with a 13- to 15-year-old tree requiring about one-half pound of borax. Another grade of borax locally available contains 20.2 percent boron. Based on actual boron, 9 ounces of this product would compare to one pound of the lower analysis product. Because of this variation in boron content of different products, be sure to check the label for actual percentage of boron. Where borax is blended into commercial fertilizer, the proper amount of borax in relation to your rate of fertilizer application can be determined and mixed accordingly. Your fertilizer plant manager will help do this.

Generally, boron is not applied until a shortage, as evidence by deficiency symptoms is noted. A good practice, from that point on, is to apply boron about every third year. Application could be made this fall

yet. However, there is no particular advantage in fall application over an application made three or four weeks prior to bloom.

---

## UNITED STATES DEPARTMENT OF AGRICULTURE

Consumer and Marketing Service  
Washington, D. C.

### Amendment to

### UNITED STATES STANDARDS FOR GRADES OF

## APPLES

### Amendment Effective October 1, 1966

As amended † 51.312 reads as follows:

#### † 51.312 Marking requirements.

The numerical count or the minimum diameter of the apples packed in a closed container shall be indicated on the container.

(a) When the numerical count is not shown, the minimum diameter shall be plainly stamped, stenciled or otherwise marked on the container in terms of whole inches, or whole inches and not less than eighth inch fractions thereof.

(b) The word "minimum", or its abbreviation, when following a diameter size marking, means that the apples are of the size marked or larger. (See † † 51.307 and 51.308.)

(Secs. 203, 205, 60 Stat. 1087 as amended, 1090 as amended; 7 U. S. C. 1622, 1624)

This amendment of the U. S. Standards for Grades of Apples shall become effective on October 1, 1966.

Dated: August 1, 1966.

G. R. Grange,  
Deputy Administrator,  
Marketing Services.

---

Can't Brush After Every Meal?  
Eat An Apple.

## Plant Water

Water is so essential to plant growth that researchers can have a fair idea of what's going on inside plant tissues if they can tell where and how much water is in the plant.

University of Wisconsin plant physiologists, headed by T. T. Kozlowski, have for some time studied the amount and movement of water within the plant at various growth stages. They feel strongly that better knowledge of water conditions in plant tissues can suggest practical ways to control harmful moisture deficits in crops.

According to Kozlowski, one method to measure water deficits in plants is to determine periodically the percentage of moisture in plant tissues on a dry-weight basis. But a serious limitation to this method is that lower moisture content on a dry weight basis often is due to increased tissue growth rather than to change of actual water intake of the plant tissue.

Of several other methods tried by Kozlowski, one appears promising. This involves measuring minute changes in stem thickness with a simple, but highly sensitive device fastened to the stem. With this device, Kozlowski found that tree stems expand or shrink as the plant takes in or loses water.

This method of measuring water content in plant tissues proved so sensitive that changes in stem thickness were recorded soon after watering the plant. Kozlowski says that you can sit and actually watch the instrument record stem expansion.

Work on determining water content and movements in plants can lead to better measurements of water stress in crops. This information could give farmers some idea on the right amount of water for irrigation of a specific crop to improve yields. This

information can also help tree surgeons to determine which part of a deceased plant to inject with a curative or preventive chemical.

## Homemakers Money Ahead With Processed Potatoes

Homemakers who value their time at 50 cents per hour or more will be money ahead preparing 3 out of 4 potato recipes with processed potatoes rather than fresh ones.

ARS food scientists at Beltsville, Md., reached this conclusion after comparing time and cost of preparation, palatability, and nutritive value of a variety of dishes prepared from processed and fresh potatoes.

Processed potatoes—canned, frozen, or dehydrated—continue to gain in popularity. USDA economists estimate that 35.1 percent of the 1965 U.S. potato crop was processed—nearly triple the 13.8 percent of the 1956 crop so used.

In their study, the ARS researchers found that less overall cooking time (minutes between starting to work and having food ready to serve) was needed for all dishes made with processed rather than fresh potatoes. Preparing frozen potato puffs for example, took only 17 minutes. Starting with unpeeled potatoes, the job required 86 minutes.

Processed potatoes required less attention from the homemaker, too. Au gratin potatoes, for example, took only a minute of the homemaker's time when the frozen product was used. A recipe calling for fresh potatoes required 33 minutes. Whole frozen boiled potatoes were the only exception. They needed 9 extra minutes of watching because water took longer to return to a boil when frozen potatoes were added.

A taste panel rated most of the  
(Continued on page 18)



# ORTHO<sup>®</sup>

**ORTHO<sup>®</sup>CIDE: CONTROLS SCAB —  
IMPROVES TREE VIGOR**

ORTHO<sup>®</sup>CIDE stops scab cold in any weather . . . on all varieties. Use it in a 7 to 10 day schedule. It penetrates into the surface and provides a "kick-back" against scab infection.

And it's gentle. ORTHOCIDE isn't likely to cause russetting. Even in muggy weather. Even on green and yellow varieties. So you can use it all season. From green-tip right on through harvest.

If used regularly, it sparks tree vigor — promotes full, deep green foliage and better finished fruit. ORTHOCIDE — "Helping the World Grow Better."



CHEVRON CHEMICAL COMPANY,  
ORTHO DIVISION  
Part of the Great Group of Chevron Companies



# OR OTHERWISE



## POTATOES — from page 16

dishes made from processed potatoes as tasty as dishes made from fresh potatoes. The panel noted differences in palatability between brands of dehydrated potatoes, and, to a lesser extent, in frozen french fries.

In nutritive value, processed and fresh potatoes were basically similar. Dishes prepared from dehydrated mixes, including au gratin, scalloped, and hash-browned potatoes and potato soup, had higher carbohydrate and mineral content and lower protein content than fresh potatoes. This difference is not critical because potatoes are not a major source of protein in U. S. diets.

The scientists also found that processed-potato products varied more in nutritive value within the same brand than between brands; within-brand variations were also greater than differences between processed and fresh potatoes.

The major nutritive difference between products tested was the amount of fat potatoes take up while frying. French fries prepared from fresh potatoes, for example, contained about 9 percent fat when served; frozen french fries reheated by frying contained 19 to 28 percent fat. Frozen french fries reheated in the oven contained 8 to 16 percent fat, with crinkle-cut and regular forms of french fries at the low end of the range and shoestring forms at the high.

—U. S. Dept. of Agr.

## Horticulture Products Survey

At the request of the Wisconsin Nurserymen's Association, the Wisconsin-Upper Michigan Florists' Association, and the University of Wisconsin, the Wisconsin and the United States Department of Agriculture, through the Wisconsin Statistical Reporting Service, are conducting a statewide survey of nursery and florist operations for 1966. Question-

naires are being prepared and will be mailed to nurserymen and florists early in 1967. Included in the survey will be questions concerned with type of operation, facilities, storage and growing areas. The data compiled will be useful to these industries in planning the future orderly development and progress of these horticultural enterprises.

All information supplied will be held in confidence and used only in developing county and state totals. No disclosure of individual operations will be made to any local, state or federal agency, private group, or individual.

The prompt response of the nurserymen and florists in returning the completed inquiry in the self-addressed stamped envelope provided will help these industries to receive the final data.

## Caged Female Insects Used To Trap Males

Can an insect population be suppressed solely by using an overwhelming number of caged female insects to attract native males to traps?

And can an insect invasion be prevented by this technique?

Answers to both questions are being sought by ARS entomologists. Their research may provide an additional biological method of controlling insects without the need for pesticides.

The method under test at Vincennes has been termed the sterile male technique in reverse. The sterile male method, which was highly successful in eradicating screwworm flies from the South, involves release of overwhelming numbers of male insects made sterile by exposure to radio-active cobalt. The males mate with native females, which produce no offspring.

At Vincennes, virgin female insects

inside traps are being introduced to overwhelm the attractiveness of the native female population. Hopefully, the sex attractant will draw enough of the males to their destruction in the traps to achieve satisfactory control.

The studies are underway in a young commercial peach orchard that has not been invaded by lesser peach tree borers. The control technique will prove promising if the isolated orchard is still free of borers 5 years from now.

If the technique succeeds with the lesser peach tree borer, it may hold promise for suppressing populations of other damaging insects.

The lesser peach tree borer invades trees through pruning scars, freeze-injury cracks, and abrasions caused by mowers and other machinery used in orchards. Such injuries become more numerous as an orchard matures.

Present insecticide sprays do not give adequate protection against the insect, which is becoming a major pest of peach trees in the Midwest. The borers are difficult to control once they become established.

The entomologists aim to provide a ration of 30 caged females to each female borer in the natural population. Sixty traps, each baited with two virgin female lesser peach tree borers, have been placed in the 45-acre orchard.

Traps are kept baited during the period when borers emerge, from late April until October. Half of the borers are replaced on alternate days from a supply reared in the laboratory.

Eventually, a synthesized sex attractant may replace the female borers in the traps. An extract of the attractant of the lesser peach tree borer has been recovered, and ARS chemists at Beltsville, Md., will attempt to identify it chemically and synthesize it. —U. S. Dept of Agr.

## Chemicals Clean Muddy Water

Inexpensive, easy-to-apply chemicals can clean muddy surface water so it can be put back into the water table, ARS scientists in Texas have learned.

Their use could save up to 85 percent of the water that now evaporates from high, undrained basins, agricultural engineer V. L. Hauser estimates.

These basins, called playas, are found in the Southern High Plains of New Mexico, Oklahoma, and Texas. Soils in the playa floors are virtually impermeable; consequently all the water that collects in playas is lost to evaporation.

For some time scientists have been experimenting with wells that will store this water underground for later use. Mud in the water has been a major obstacle; sediment quickly plugs up the wells. Filtering systems have been used, but are difficult to clean and operate.

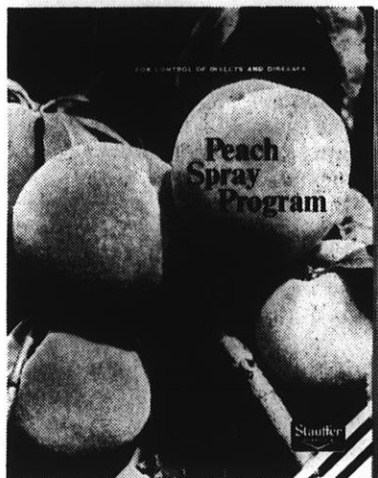
In cooperative tests with the Texas Agricultural Experiment Station at Bushland, Hauser and ARS soil scientist F. B. Lotspeich found that adding a mixture of alum and cationic polyelectrolyte to the water reduced sediment by 90 percent. Cationic polyelectrolytes are compounds that, because of their positive electrical charge, cause fine sediment particles to cluster and settle.

To test the chemical treatment under field conditions, the researchers drilled 6-inch wells near the edge of a playa. They drew water from the playa with a suction pump, treated it, held it for a time in a settling basin, put it through a coarse gravel filter to remove large debris, and finally released it into the wells.

About 20 million gallons of water were returned to the water table during the experiment. Eventually the wells began to clog, but they were restored to efficiency with a commercial well-bailing unit.

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