

# Understanding And Treating *Eutypa* Dieback Of Apricots

by Bill Coates

**E**utypa dieback is rapidly becoming the most serious disease problem in coastal apricot orchards. *Eutypa* is a limb dieback disease formerly called *Cytosporina*. It is present in most of the apricot growing regions of the world and can also be a serious pest of grapevines. In California it is most severe in the coastal valleys but also occurs from Los Banos north to Yolo County in lesser amounts.

For many growers, the first symptom of the *Eutypa* dieback is the sudden wilting of an apricot limb in mid-summer. The limb dies so quickly that the dead, dry leaves remain attached to the limb making them quite visible.

Other symptoms include large dark cankers on the limbs, usually originating at pruning wounds and often exuding amber-colored sap. Infected limbs also have discolored inner wood which is easily observed when cutting off the infected limb.

Sometimes growers confuse *Eutypa* infections with other diseases such as bacterial canker or *Verticillium* wilt. Your Farm Advisor or crop consultant can help you sort these out but, in general, bacterial canker and *Verticillium* wilt unlike *Eutypa* are worse on young trees and are not associated with dark cankers originating at pruning sites. Limbs dying from bacterial canker may have gumming but this only occurs in the early spring. *Eutypa* can kill a limb anytime but it is more

visible in the summer. *Verticillium* wilt may discolor the inner wood but does not gum like *Eutypa*.

Exactly what is *Eutypa*? *Eutypa* is a fungus disease caused by the organism *Eutypa lata*. For years it was known by the name of its asexual stage, *Cytosporina*, and some growers still refer to it by this name or less specific but more descriptive names such as gummosis or limb dieback.

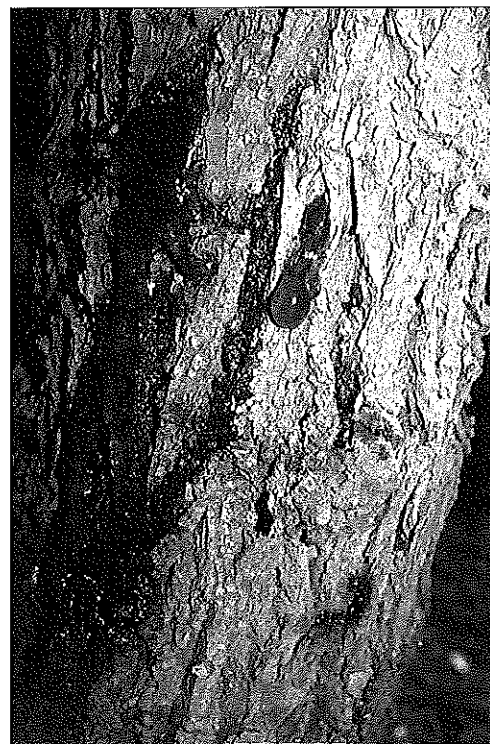
While generally thought of as a disease of apricot trees and grapevines, this fungus can infect many other hosts. *Ceanothus* and western chokecherry are wild hosts in California. More recently it has been found in a commercial sweet cherry orchard.

*Eutypa* is a wound-infecting fungus. In the absence of pruning, this disease would rapidly become a non-problem in California apricot orchards. Unfortunately, pruning is necessary to maintain vigor, train trees, control crop size, prevent shading out of interior fruit wood and keep trees to a manageable size. These horticultural requirements mean that since pruning wounds will be present we must determine how we can best protect them. Some knowledge of how and when infections occur aids us in determining a management strategy.

Fresh pruning wounds are infected by the ascospores of *Eutypa*. These ascospores are produced in perithecia which occur on old dead branches in areas of moderate to high annual rainfall predominantly in coastal valley locations such as San Benito, Santa Clara, Alame-

da, Contra Costa and Sonoma counties. Perithecia are very rarely found in the Central Valley but ascospores can be blown 60 or more miles by the prevailing westerly winds.

Spores are discharged only during or shortly after rainfall of at least .05 inches. Large numbers of ascospores are discharged during fall, winter and spring



One of the many symptoms of *Eutypa* is large dark cankers on the limbs, usually originating at pruning wounds and, as pictured here, extrude amber-colored sap.

rainstorms with a peak in October and a lesser peak in April. Some researchers have documented relatively low spore numbers from early November through late December and have suggested mid-November to mid-December pruning.

*Bill Coates is a University of California Cooperative Extension Farm Advisor for San Benito County.*

# WHAT'S NEW FOR GROWERS

## New Cox<sup>2</sup> Recorder

Cox Recorders has just recently released a totally redesigned version of its popular, easy to use and affordable Cox temperature recorder. The new product, the Cox<sup>2</sup> Recorder, is the result of an industry survey of the needs of temperature recorder users.

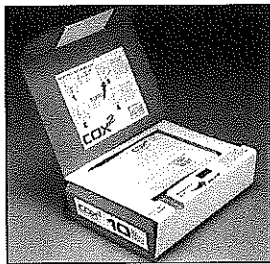
The Cox<sup>2</sup> Recorder is built to be used in all types of temperature sensitive shipments, and serves to protect the load by monitoring the performance of the carrier in maintaining temperature. Temperature recorders ride with the load as a necessary "third party" source of unbiased evidence.

Packaged in a protective corrugated sleeve, the Cox<sup>2</sup> is a self-contained, battery powered instrument which tracks temperature versus time, and plots the data on a strip chart. The Cox<sup>2</sup> produces a wide and easy to read chart of a special material never before used in temperature charting. High accuracy of temperature sensing ( $\pm 1$  degree F/ $\pm 0.6$  degrees C) results from the use of this material, which produces a very bold trace on the chart which will photocopy and Fax with ease.

Like its predecessor, the Cox<sup>2</sup> is simple to activate and install: the shipper simply fills out the shipping information on the multipart form on the outside of the recorder, pulls the "start tab" and places the recorder in the load.

The unique Cox<sup>2</sup> design combines visual and audible verification of recorder running at startup, so that installation can proceed with confidence.

When the shipment reaches destination, the Cox<sup>2</sup> Recorder immediately delivers its charted information after the tamperproof security seal on the instrument is removed. A pop-open door on the instrument presents the chart for easy removal. Return address and pre-paid postage information printed on the corrugated sleeve makes recorder return as simple as dropping it in the mail.



Cox Recorders provides Cox<sup>2</sup> with calibration information already inscribed on the chart, since each unit is test-run before leaving the factory. The result of the test run appear on the actual chart in the unit, and serve to verify timing and temperature accuracy. Technical experts at Cox Recorders are on call for assistance in interpreting the temperature record or to re-verify recorder performance.

## New Product Extends The Life Of Fruit And Vegetables

Farmers will now be able to deliver fresher produce to their customers thanks to a new chemical-free packaging product that extends the life of fruit, vegetables, and herbs for weeks, even months. Evert-Fresh bags and packaging film are lined with a natural mineral that absorbs and removes ethylene gas.

In addition, Evert-Fresh bags and packaging film "breathe" so that other damaging gases generated by fresh produce are removed. An anti-fogging treatment minimizes moisture and inhibits bacteria growth.

"This product appeals to farmers because it extends the length of time they have to get the produce to market," said Tom Stewart, president of Evert-Fresh Corporation, a Houston-based company. "Our packaging, which is reusable, allows growers to store produce longer preventing glut supply situations which encourages lower prices. In addition, our bags and film allow growers and shippers to plan more efficient travel itineraries for their deliveries."

Another benefit of the film is that it allows farmers to transport mixed loads of produce, according to Stewart. "However, the ultimate reason growers should use our<sup>38</sup>

film is because it enables them to provide fresher produce — that has a longer shelf life — to their customers."

Dole Tropifresh conducted shelf life tests using Evert-Fresh film on its fresh green asparagus. Results showed that asparagus wrapped in Evert-Fresh film dete-

riorated significantly less than that wrapped using their existing commercial packaging. Stemilt Research and Development Lab conducted similar tests using pear firmness, sugar content and color. Other research conducted using the film has proven that Evert-Fresh packaging reduces vitamin C loss up to 50 percent on broccoli.

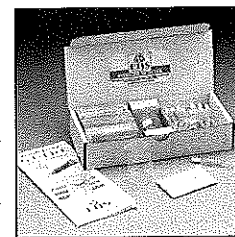
Bulk Evert-Fresh is available in double-tube rolls, ranging in width from six to 40 inches. However, Evert-Fresh film can be custom manufactured to meet any size requirements. For more information about the film, or where rolls can be purchased, contact Evert-Fresh at (713) 529-4593.

## EHS Products Introduces Low-Cost, On Site Pesticide Detector Kit

Environmental Health & Safety Products, Inc. has introduced a pesticide detector kit capable of providing on-site detection of over 300 insecticide products. The EHS on-site tests allow anyone to determine the presence of toxins in less than 10 minutes. Cost per test is under six dollars.

The various classes of insecticides include the carbonates, organophosphates and thiophosphates. These represent the three most toxic classes of insecticides most commonly used in food production and pest control. The EHS pesticide detector will determine as little as 0.1 parts per million on surfaces and in water, soil, grains, vegetables and fruits and many other substances. In fact, it offers immediate testing without sending samples to labs for analysis. The result is a substantial savings in time and money.

Currently, the EHS pesticide detector is available in 20-unit test kits. Everything required is included. More information about this new, low-cost insecticide detection kit is available from EHS Products, Inc., 3500 W. 75th St, Suite 304, Prairie Village, Kansas, 66208. For literature or more information on the EHS Pesticide Detector, call (800) 779-3477 (EHSP).



In actual practice, there is no safe time to prune during the fall, winter and spring. Orchards in San Benito County consistently pruned either early or late are both heavily infected. Part of the problem is probably the erratic and often very dry autumns during the drought which may have delayed spore release

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patterns. Certainly another problem is the long susceptibility of pruning to *Eutypa* infection — up to six weeks in the fall and two weeks in the spring.

How do we manage *Eutypa* dieback? There are several management alternatives available and current research being conducted by University of California Plant Pathologists Doug Gubler and Beth Teviendale as well as this author in San Benito County may expand the alternatives soon. The following alternatives are available currently.

1) No pruning: This is not acceptable to California growers but might be useful for home gardeners. It might be possible to develop some training systems which makes use of this alternative.

2) Summer pruning: Since there is little chance of infection in the summer, this should certainly be considered as a possible alternative. Mechanical topping after harvest is already practiced in many northern San Joaquin Valley apricot orchards. Hand-pruning young trees would also seem logical at this time.

Hand pruning mature trees in the summer would require some adjustments in farm labor availability and training. Prior to August 1, it appears that substantial regrowth may occur. After August 1, chances for regrowth from pruning cuts decline rapidly. Statistically, the chance of significant rainfall begins to increase substantially by the last week of September in most apricot growing counties. August pruning seems to be an ideal compromise between horticulture requirements and avoidance of spore release. However, no long term research studies have been done utilizing August pruning. We hope to establish one this summer. Fortunately, *Eutypa* is not spread by pruning tools.

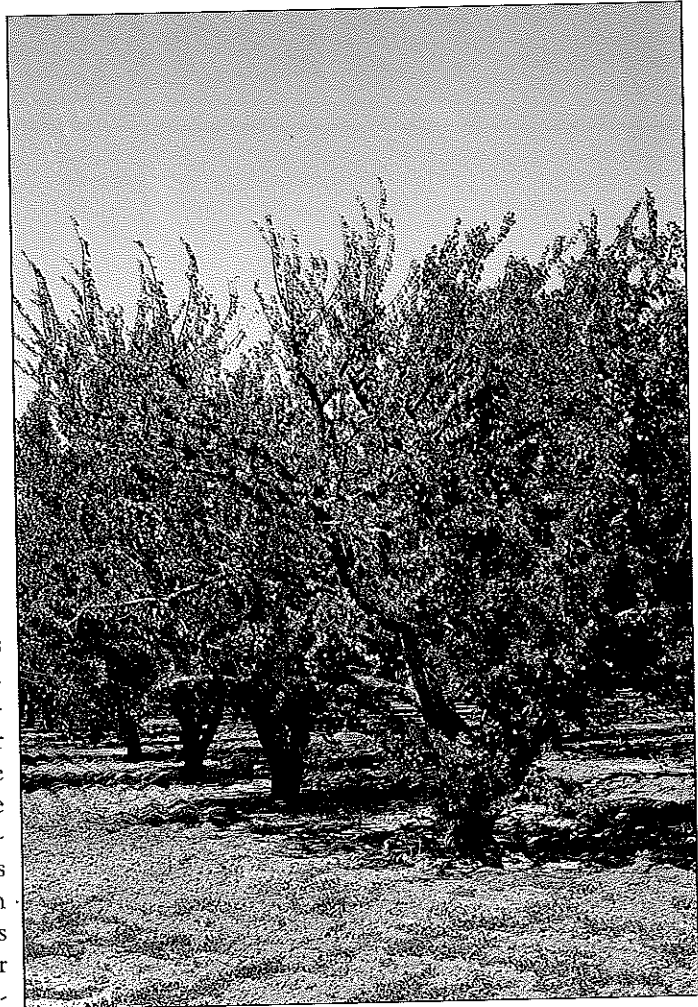
3) Chemical Control: Most fungicides are ineffective in preventing *Eutypa* infections — no registered fungicides are eradicants. Benomyl (Benlate) and other benzimidazole fungicides are moderately effective as protectants when painted on pruning wounds immediately after pruning. Registration status at the rate required for efficacy (1.5 pound per gallon of water) is a gray area. Recent research in San Benito County has uncovered at least one other fungicide and possibly more that may be very effective protectants. None are currently registered on apricots.

4) Tree Sealants and Paints: In general, both latex paints and tree sealants have been ineffective in preventing *Eutypa* infections. Sealing each wound

by flaming with a propane torch has been effective in limited tests in San Benito County.

5) Biological Control: *Fusarium lateritium* has been shown to be an effective biocontrol agent but is unavailable commercially.

6) Source Removed: Abandoned apricot orchards should be removed and burned as well as any *Eutypa*-infected limbs and stumps within an orchard. Cut at least eight inches (or more) below the



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canker during mid-summer to reduce the chance of re-infection.

7) Maintaining Orchard Vigor: A vigorous limb removal program combined with a good fertilizer and irrigation management program may help keep you in business. To succeed, you need to incorporate some of the other six steps, train new scaffolds as needed and replace unproductive trees.



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