

# TECHNICAL NOTES

U.S.D.A. SOIL CONSERVATION SERVICE Gainesville, Florida

AGRONOMY

BIOLOGY

PLANT MATERIALS

RANGE

WOODLAND

AGRON-FL-33

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## NEW FREEZE PROTECTION TECHNOLOGY

Protecting valuable plants from freeze damage- is a major- concern of Florida fruit, and vegetable growers. Previous methods of freeze protection have been discontinued due to high cost; e.g., heaters, and increasing pressures to restrict agricultural water use cast doubt on the reliability of irrigating for freeze protection. A method of protection widely used in Europe is being evaluated for use in Florida, and it looks very promising.

Studies conducted at the University of Florida in Gainesville confirm that non-woven fabric row covers offer a practical solution to large scale frost protection. The fabric, made from bonded polypropylene, traps heat that is radiating from the soil, keeping it from being lost to the atmosphere. During the winter of 1986 when the temperature was 27 degrees F, the temperature under the cover ranged from 31 degrees to 42 degrees F.

The fabric is lightweight and porous to air and water, and is much cheaper than temporary plastic greenhouse-type shelters. One sheet covering an acre weighs only 130 pounds, and can be installed by four people in about 15 minutes. Since it is porous, excess heat will not build up under the fabric so it doesn't have to be removed each day. Regular irrigation can be done with the fabric in place, so it could be left in place for several days. Since it is lightweight, it does not physically damage the plants when resting on them. The fabric comes in 10 and 50 foot lengths. It is not affected by sunlight like plastic is, so it can be saved for reuse in the future.

Additional information on non-woven fabric can be obtained from:

International Paper Co.  
1290 6th Ave.  
New York, NY 10104  
(212)459-7376

Kimberly Farms  
1400 Holcomb Bridge Rd.  
Roswell, GA 30076  
(404)587-8090

In addition to fabric covers, there are several chemicals on the market to help prevent frost damage. They are:

Safer's For Ever Green can be applied up to 4 weeks prior to a freeze, and retain its effectiveness for up to 12 weeks. It reportedly provides protection in temperatures as low as 19 degrees F.

Delacar tested its Pro-Tec formulation on planted citrus trees in Georgia last winter. A patented anti-transpirant polymer, the chemical is sprayed

on to form a semi-permeable membrane on the surface. This cuts down evaporation from the plant for 120 to 180 days. 29 of the 35 young citrus trees in the experiment survived temperatures as low as 18 degrees, with more than 50 percent leaf drop and minor wood damage. By mid-May, all of these were flourishing.

Plants Product's Frost Free propylene glycol is a non-ionic surfactant that has been tested for frost protection on citrus, vegetables, ornamentals and blossoming fruit trees. It appears to prevent crystallization of water in or around plant cells. Application should be at least 8 hours before frost is expected.

Agri-Mart offers Agri-Shield, a wind chill and frost damage inhibitor for citrus, vegetable, ornamental and row crops. It is said to retard evapo-transpiration water loss.

Polymer Technologies markets Crop-Life, a blend of acrylic latex and protein polymers, dispersants and moisturizers. The product is said to create a clear, elastic "second skin" that provides 90-day protection against frost (as well as wilt, heat stress, chemical bonding and other benefits).

Custom Chemicides' Frostgard has protected citrus and avocados at temperature of 24 degrees F. It should be sprayed on at least 24 hours before a freeze, and remains active for 30 days. It is known as a bacterial ice-nucleation-inhibitor, lowering the temperature inside the plant at which cell structure can be damaged. It can also be used on cole crops and other vegetables, pecans, ornamentals and strawberries.

Information on chemicals for frost protection can be obtained from:

Plant Products  
Corp. Box 1149  
Vero Beach, FL 32961  
(305)567-5261

Safer, Inc.  
60 William Street  
Wellesley, MA 02181  
(617) 237-9600

Polymer Technologies, Inc.  
Box 568  
Nocates, FL 33864  
(813)494-1782

Custom Chemicides  
Box 11216  
Fresno, CA 73772  
(209)264-0441

Agri-Mart  
9302 Denton Ave.  
Hudson, FL 33567  
(800)533-5262

Delacar Corp.  
Box 13566  
Tavares, FL 32778  
(904)587-8860

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