

# PLANT & PEST ADVISORY

FRUIT EDITION \$1.50

FEBRUARY 11, 1997



## Honey Bee Crisis and Alternate Pollination

*Jerome L. Frecon, Gloucester County Agricultural Agent*

Many articles have been written on the bee problem in the United States. Dr. Roger Morse, an Agricultural Apiculture Specialist at Cornell University, had an excellent article in the January issue of the *American Agriculturist* on the extensive losses of domestic honey bees to tracheal and varroa mites.

Dr. Richard Nunamaker, former Bee Specialist at the USDA Disease Research Laboratory in Laramie Wyoming, spoke on this issue at the Western Colorado Horticultural Society Meeting in January. Dr. Nunamaker emphasized that there were drastically reduced supplies of wild bees in Wyoming and Colorado and that domestic honey bees are rapidly being killed by varroa and tracheal mites. He described in detail how they parasitize bee colonies, and that there is really no effective control. Sanitation by isolating non-infested hives from infested hives is very important and beekeepers must know where other hives are located. Dr. Nunamaker did not feel pesticide poisonings were a major factor in the bee decline problem in Colorado.

The *Pennsylvania Vegetable Growers News* contained an article, "Honey Bee Crisis Situation in the Northeast" in the December issue. It stated, "Pennsylvania's honey bee colonies were devastated last winter. Colony losses were alarmingly high. In a survey of 59 western Pennsylvania beekeepers, 55% of their colonies (873 of 1576 colonies) were dead by mid-March. A similar survey of 21 beekeepers in eastern Pennsylvania revealed 60% mortality (405 of 676 colonies). Other states in the Northeast Region experienced similar winter losses.

As a result, honey bee colonies rented for pollination were in short supply this spring and summer. These extreme losses were the result of infestation by two introduced parasitic mites (tracheal and varroa mites) and viral or bacterial diseases these mites may be carrying. The new epidemic has been called Parasitic Mite Syndrome and is poorly understood. However, one consistent feature of the disease is the presence of varroa mites in the colony superimposed upon a high rate of tracheal mite infection. Viral illnesses transmitted by the mites are thought to play an important role in the death of bee colonies. With so little known about Parasitic Mite Syndrome, beekeepers are at a loss to protect their colonies."

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## Apple Rootstocks M.9 and B.9 for New Jersey

Winfred P. Cowgill, Jr., Hunterdon County Agricultural Agent

For growers in New Jersey contemplating establishing high density apple blocks on full dwarfing rootstocks there are several choices, the M.9 and B.9 Clones.

The original M9 rootstock was tested in New Jersey by Dr. Maurice Blake of the New Jersey Agricultural Experiment Station. Initially called the Paradise apple rootstock, it was first studied in the early part of this century. Since then, no rootstock has been more evaluated and planted than M9 and its clones. Today the M9 clones are the most widely planted rootstocks in western Europe and are the most widely planted fully dwarfing rootstock in North America.

M9 and the newer B9 clones produce trees that must be supported in some form. This requires significant capital outlay as well as additional management skills. The trend in western Europe has been for each nursery to select and patent its own proprietary clone of M9. Until recently not much information on the differences between the performance of these clones was available. Several plantings of the North Central Region 140 rootstock research project of the USDA has generated valuable information on both M9, B9 and their many clones. The 1994 NC-140 apple rootstock plantings located at the Rutgers Snyder Research and Extension Farm is a replicated trial of 19 full dwarfing stocks which include most of the M9 clones available on the market today. It is important to know what clone of M9 you are planting in your orchard when determining tree density per acre and the management system you are going to use.

The following has been revised from an article by Dr. Terrance Robinson, one of the world's leading experts on apple rootstocks. This article will give you the knowledge you need to assist in choosing the correct apple rootstock for your farm's location and your management skills. The take home message should be "not all MSS are created equal"!

While the recommendations are for New York State they apply to the finer textured heavier soils of Northern and Central New Jersey. Caution should be utilized when planting M9 on coarse textured sandy soils. M9 and its clones are not drought tolerant and must have supplemental irrigation on coarse textured soils and will benefit from supplemental irrigation on fine textured soils as well.

The NC-140 apple plantings in New York's Hudson Valley have performed similarly to our Rutgers Snyder farm plantings.

SEE M9 AND B9 ON PAGE 4

## Zinc in Peach Trees In Southern New Jersey

Jerome L. Frecon, Gloucester County Agricultural Agent

Many of the Zinc levels in peach leaf samples taken as part of our IPM monitoring program were low, in the 12 - 15 ppm range.

Ziram can be used to increase Zinc, which is essential in very small quantities. Zinc can also be applied as a soil application or as a foliar spray after harvest while leaves are still active. However, Zinc moves slowly in the soil and if the phosphorous levels are higher, it will inhibit Zinc uptake. Zinc also tends to be low in soils with low organic matter. Most of our southern New Jersey soils are very high in phosphorous and have lower levels of organic matter. Zinc can also be low in peach trees grown in high pH.

Zinc can be applied at the rate of 5 - 10 pounds of actual Zinc or 5.5 to 11 pounds Zinc sulfate in 100 gallons of water. It is also part of many foliar micronutrient formulations. Do not apply Zinc with oil. It can be applied with pesticides.

Zinc is an important element in peach trees. It is a component of 60 enzymes, thus, has a role in many plant functions. Zinc has a major role in the production of IAA, a growth hormone.

When Zinc deficiency appears it is exhibited as small, maroon leaves growing on shoots with short internodes. This is called rosetting. Fruit growth is also reduced via small misshapen fruit with Zinc deficiency. □

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### BEES FROM PAGE 1

Dr. Susan Batra, USDA Bee Researcher, spoke on alternate pollinators for orchards in the recent Tri-State Horticultural Meetings at Hershey. Dr. Batra brought samples and discussed her work with the "Hornfaced Bee - *Osmia cornifrons*" an excellent pollinator for tree fruits in Japan. Dr. Batra said this bee is used to pollinate apples, pear and cherries and is attracted primarily to Rosaceae family plants. It is a solitary bee (not domestic), does not make honey and is resistant to tracheal and varroa mites and domestic honey bee diseases. According to Dr. Batra, growers raise them themselves in Japan.

The hornfaced bee is relatively easy to raise, being dormant most of the year until it emerges in the spring to pollinate trees. It can be kept cold in a storage tub developed by Dr. Batra until ready for release in the spring. Dr. Batra's talk in its entirety will be in the spring issue of New Jersey Horticultural News along with a list of suppliers. She has no more bees available for this spring. Her address is: Bee Research Laboratory, ARS-USA, Building 4761, Beltsville, MD 20705. Phone # (301) 504-8384. □

## New Rootstocks for Southern New Jersey

*Jerome L. Frecon, Gloucester County Agricultural Agent*

In the 1996, Volume 29 issue of the IDFTA Compact Fruit Tree, Dr.'s T.L. Robinson, James C. Cummins, Stephen Hoying and Warren Smith describe the performance of the Cornell-Geneva (CG) Apple Rootstocks in New York.

Many of you are familiar with the problems of the Malling (EM) and Malling Merton (MM) rootstocks and their limitation in our droughty, loamy sands and sandy loams in southern New Jersey. These rootstocks were developed for the climate of Great Britain and have been grown with success, and variable horticultural characteristics across the United States. Each of them has significant limitations. The Cornell Geneva rootstocks were developed with the best horticultural characteristics and resistance to fireblight and Phytophthora sp root rot.

Many growers in Southern New Jersey wanting a dwarfing tree that was early bearing yet free-standing with less tendency to runt out from drought, have planted M-7, M-7A or EMLA-7. CG.30 was introduced in 1995 to compete with M.7. It is a rootstock now available from commercial nurseries and may be of interest for southern New Jersey.

The authors had the following to say about CG.30: "Four of our plots had comparisons of CG.30 and M.7. In general, CG.30 gave trees similar in size to M.7 (in 3 of the 5 trials CG.30 produced a tree slightly larger than M.7 while in 2 of the 5 trials it gave a tree smaller than M.7). In all of the trials, CG.30 was substantially more productive and efficient than M.7. Its early yield efficiency ranged from a low of twice that of M.7 to a high of 6 times that of M.7. This result indicates the biggest advantage of CG.30 over M.7. Typically, M.7 has been a good rootstock in New York but its lack of production in the first 5 years has been a disappointment to many growers. It appears that CG.30 will have excellent flowering and fruiting beginning in the third year. Suckering has been less with CG.30 than M.7 and tree branch angle has been flatter than with M.7. Based on these results and similar first test results, we are recommending CG.30 as a replacement for M.7. Although probably too vigorous for high density orchards with most scion cultivars, it may be an excellent choice for spur-type varieties at high densities of about 500-600 trees per acre."

"Another stock similar to CG.30 which is scheduled to be released in 1996 is CG.210. It has generally been slightly larger than either M.7 or CG.30. Its unique advantage is that it is resistant to woolly apple aphids and may provide a significant advantage in climates where this insect is a serious chronic pest. Unfortunately, it's anchorage may not be as good as CG.30 and may be similar to M.7 in that regard." □

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## New Jersey Farm Market Directory

*Ramu Govindasamy, Ph.D., Marketing Specialist*

The New Jersey Department of Agriculture in conjunction with Rutgers Cooperative Extension is in the process of updating the New Jersey Farm Market Directory. The Farm Market Directory currently contains about 300 farm markets, 30 farmers' markets, 40 berry markets, 17 egg markets, 28 hay markets, 23 honey markets, and 29 specialty item markets. If you would like to check whether your market has been listed in the directory, or to include your market in the directory, please contact Ron Good, New Jersey Department of Agriculture, Ph. 609/292-8853. At a later date, the same directory will be placed on the Rutgers Cooperative Extension home page, maintained by Rutgers University. Please note that the deadline for the inclusion of markets is the first week of April, 1997. If you have any questions, you may also contact Dr. Ramu Govindasamy, Marketing Specialist, Rutgers Cooperative Extension at (908) 932-9171, x-25. □

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## Web Site: Where to Find New Jersey Apples

*Jerome L. Frecon, Gloucester County Agricultural Agent*

A listing of New Jersey apple growers marketing directly to consumers is available at the Internet address: <http://WWW.state.nj.us/agriculture/applebro.htm>. The list is part of the New Jersey Department of Agriculture Home Page (see January newsletter for address).

The listing includes the name and address of the grower, phone and fax number, hours of operation, other products sold, and directions to the farm. The farm or retail outlet listings are in alphabetical order and divided by north, south and central New Jersey.

This information is patterned after the printed brochure, "Where To Find New Jersey Apples" published by the New Jersey Apple Industry Council, a unit of the New Jersey Department of Agriculture.

If you are a grower who sells retail you should be on this list. Call (609) 292-8853 to be included. □

## Understanding and Using Clones of M.9 Rootstock and B.9 Rootstock

*Dr. Terrance Robinson, New York State Ag Experiment Station, Geneva, NY*

Recently several clones of M.9 rootstock have become commercially available. In planning a new high-density orchard with M.9 it is important to understand that there are differences in vigor among the clones of M.9 on the market.

### Clones of M.9

In the 1960's several countries began programs to eliminate the latent viruses contained in the original M.9. From this effort several clones have been selected.

- From England have come the M.9a and M.9EMLA clones.
- From the Netherlands have come M.9NAKB337, 338, 339 and 340 and M.9Flueren25, 49, 56, 59 and 86 clones.
- From Belgium have come M.9Nicolai4, 8, 19, 25, 29, and 39 clones.
- From Germany have come M.9Burgmer719, 751 and 984 clones.
- From France have come M.9Pajam1 (Lancep) and Pajam2 (Cepiland) clones.

Researchers in Holland studied the nursery characteristics of many of the M.9 clones and categorized them into 3 groups.

- Group 1. Clones in this group had thin shoots, good rooting ability, many spines (short lateral shoots on 1 year wood) in the nursery stool bed. They also did not flower readily if allowed to grow as a tree and had a juvenile character. Representatives of this group are Nic29, Pajam2 and Flueren56.
- Group 2. Clones in this group had good rooting, some spines and intermediate juvenile/mature character. Representative clones in this group are NAKB337, Burg719 and Burg751.
- Group 3. Clones in this group had thick shoots, poor rooting and no spines. If allowed to grow, they flowered readily and had an adult character. Representative clones in this group are EMLA, NAKB338 and Burg984.

The clones of M.9 also varied in their orchard performance. The more vigorous clones produced a larger caliper tree resulting in a larger tree canopy volume and greater yields per tree. Yield efficiency (yield per unit canopy volume or trunk cross-sectional area) in many cases did not differ but in some trials the most vigorous clones were significantly less efficient than the more intermediate and low vigor clones.

Many of the clones are not commercially available in the US. The 7 clones that are currently available are M.9, M.9EMLA, M.9NAKB337, M.9Flueren56, M.9Nic29, M.9Pajam1 and M.9Pajam2. From our experience they fall into 3 vigor classes:

Weaker group: M.9 (original), Flueren56 and NAKB337.

Intermediate group: EMLA and Pajam1 (Lancep)

Vigorous group: Nic29 and Pajam2 (Cepiland).

All of these clones have shown high yield efficiency and with the range in vigor a grower can fine tune the choice of M.9 to match his particular soil and the variety he will plant. We have the following suggestions:

- 1) On replant sites use one of the more vigorous clones such as Pajam2 or Nic29. Both will have better rooting at planting and will likely grow better in a replant site.
- 2) On virgin sites with strong fertile soil, use one of the weaker clones such as Flueren56 or NAKB337.
- 3) With weak varieties like Empire, Idared, and Jonamac use the more vigorous clones such as Pajam2 and Nic29.
- 4) With vigorous varieties like McIntosh, Mutsu, Jonagold and Fuji use the weaker clones like Flueren56 and NAKB337.
- 5) With medium vigor varieties like Gala, Cortland, and Golden Delicious use M.9EMLA or Pajam1.

This strategy requires several years of advance planning before planting the new orchard. A grower must work with their nurseryman far enough in advance so the nurseryman can purchase the right clone of M.9 for the grower's specific situation.

### B.9

Of the newer rootstocks in the M.9 to M.26 category, the one rootstock we are recommending for New York growers is Budagovsky 9 or B.9. This stock has had widespread testing across the US and has performed very well in terms of survivability and productivity. It has survived field fireblight epidemics in Ohio better than M.9. For New York its main advantage is that it is a few degrees more winter hardy than M.9. Therefore, for Northern New York in particular, it should be the rootstock of choice in high density orchards.

For growers in the rest of New York state, B.9 may be slightly inferior to M.9 since it usually is not quite as efficient as M.9 and the risk of winter injury is not so severe as in the north country. Nevertheless, it still is an excellent alternative to M.9.

### Summary

Often the success of a high-density orchard depends on the ability of the grower to choose the right rootstock for his particular soil, climate, orchard system and tree spacing. If the combination of rootstock, spacing, soil and climate results in excessive vigor, the trees will quickly outgrow their assigned space and will require excessive pruning to manage the planting. If on the other hand, the trees do not fill their allotted space as soon as expected, then yields will be less than expected. By understanding the differences between the clones of M.9 and when to use B.9 instead, growers may better be able to choose and plant a combination that will perform adequately in their site. □

# Fruit Meeting Calendar

**February 20, 1997** - South Jersey Fruit Meeting, Masso's Crystal Manor, Glassboro, NJ.  
CONTACT: Jerry Frecon (609) 863-0110.

Labor Management for Fruit Growers, Masso's Crystal Manor, Glassboro, NJ. Speaker: Alison Demarree - Area Extension Specialist/Production Economist, Cornell University  
CONTACT: (908) 932-0100

**February 23, 24, 25, 26, 1997** - International Dwarf Fruit Tree Association Conference, Hilton Hotel, Rochester, NY.  
CONTACT: Bruce Barritt (509) 663-8181, Ext. 233.

**To be rescheduled: March, 1997** - South Jersey IPM-Tree Fruit Meeting, Gloucester County Office Bldg., Clayton, NJ.  
CONTACT: Dean Polk (609) 758-7311.

**March 6, 1997** - North Jersey Fruit Meeting, Rutgers Snyder Research and Extension Farm, Pittstown, NJ  
CONTACT: Win Cowgill (908) 788-1338.

**March 8, 1997** - Grape Expectations: A Viticultural and Enological Symposium. Forsgate Country Club, Jamesburg, NJ.  
CONTACT: Dr. Josph Fiola (609) 758 7311.

**April 1, 1997** - Evening Fruit Meeting (7:30 p.m.) Donio Farms, Hammonton, NJ.  
CONTACT: Jerry Frecon (609) 863-0110.

**April 9, 1997** - Evening Fruit Meeting (7:30 p.m.) Gloucester County Office Building, Clayton, NJ.  
CONTACT: Jerry Frecon (609) 863-0110.

**April 16, 1997** - Evening Fruit Meeting (7:30 p.m.) Donio Farms, Hammonton, NJ.  
CONTACT: Jerry Frecon (609) 863-0110.

**April 29, 1997** - Evening Fruit Meeting (7:30 p.m.) Gloucester County Office Building, Clayton, NJ.  
CONTACT: Jerry Frecon (609) 863-0110.

**May 13, 1997** - Evening & Twilight Fruit Meeting (6:30 p.m.) Rutgers Research & Extension Center in Upper Deerfield Township, NJ.  
CONTACT: Jerry Frecon (609) 863-0110.

**May 21, 1997** - Twilight Fruit Meeting (6:15 p.m. - site to be determined) in South Jersey, NJ.  
CONTACT: Jerry Frecon (609) 863-0110.

## New Small Fruit Publications

*Jerome L. Frecon, Gloucester County Agricultural Agent*

Thanks to the effort of Dr. Joe Fiola, Extension Specialist in Small Fruits and Viticulture, the following new publications are available from your area fruit agent or county agricultural agent in New Jersey. They are:

| <u>Cat No.</u> | <u>Title</u>   | <u>Cost</u> |
|----------------|--|-------------|
| FS193          | NJ Commercial Strawberry Pest Control Recommendations I  | Free        |
| FS194          | NJ Commercial Strawberry Pest Control Recommendations II | Free        |
| FS251          | 1997 Commercial Bramble Pest Control Recommendations I   | Free        |
| FS252          | 1997 Commercial Bramble Pest Control Recommendations II  | Free        |
| FS253          | 1997 NJ Commercial Grape Pest Control Recommendations I  | Free        |
| FS254          | 1997 NJ Commercial Grape Pest Control Recommendations II | Free        |

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