



# CONFERENCE BULLETIN

39th Annual IDFTA Conference ■ February 26 – February 29, 1996 ■ Penticton, British Columbia, Canada

Conference Special

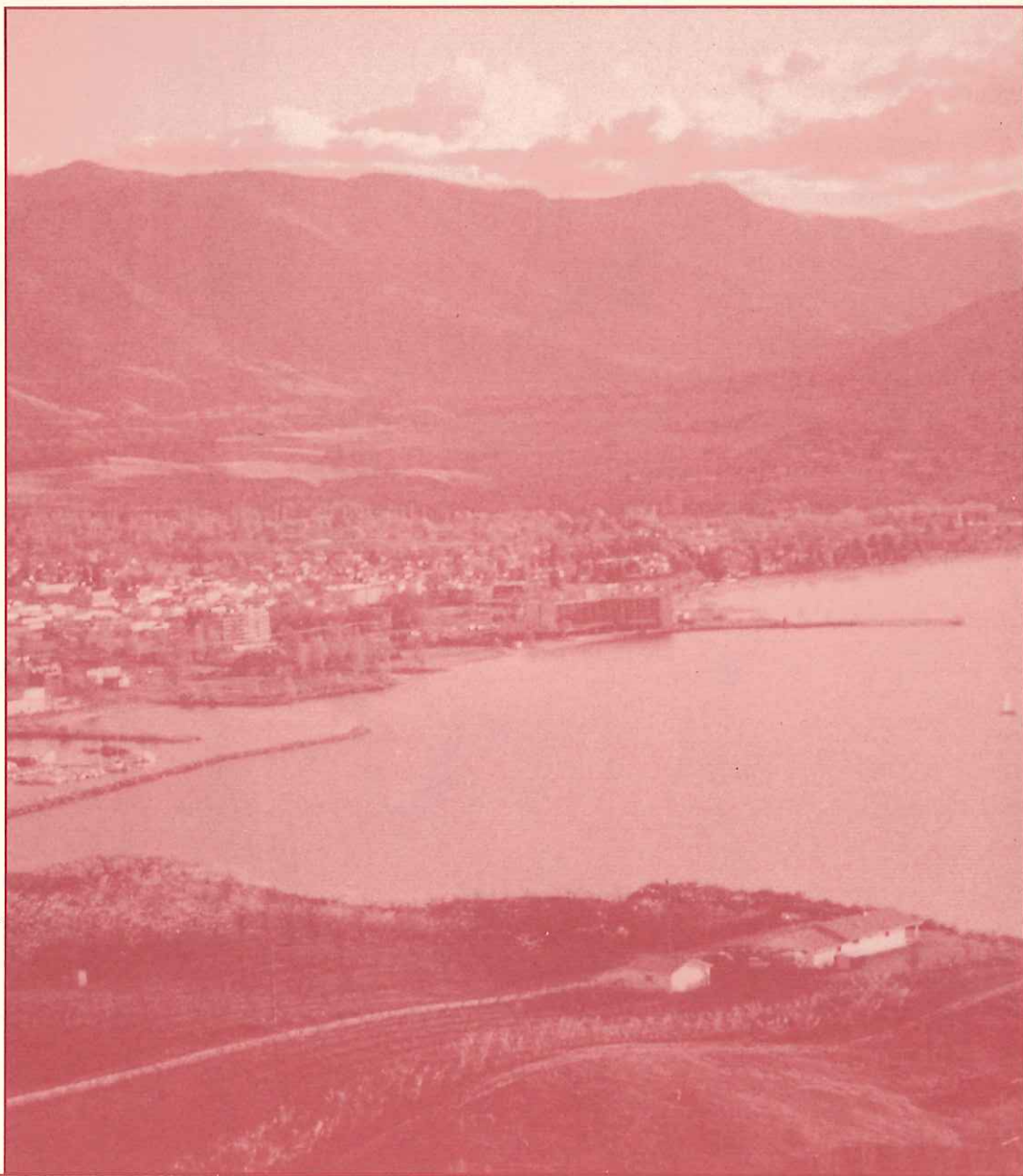
Compact News

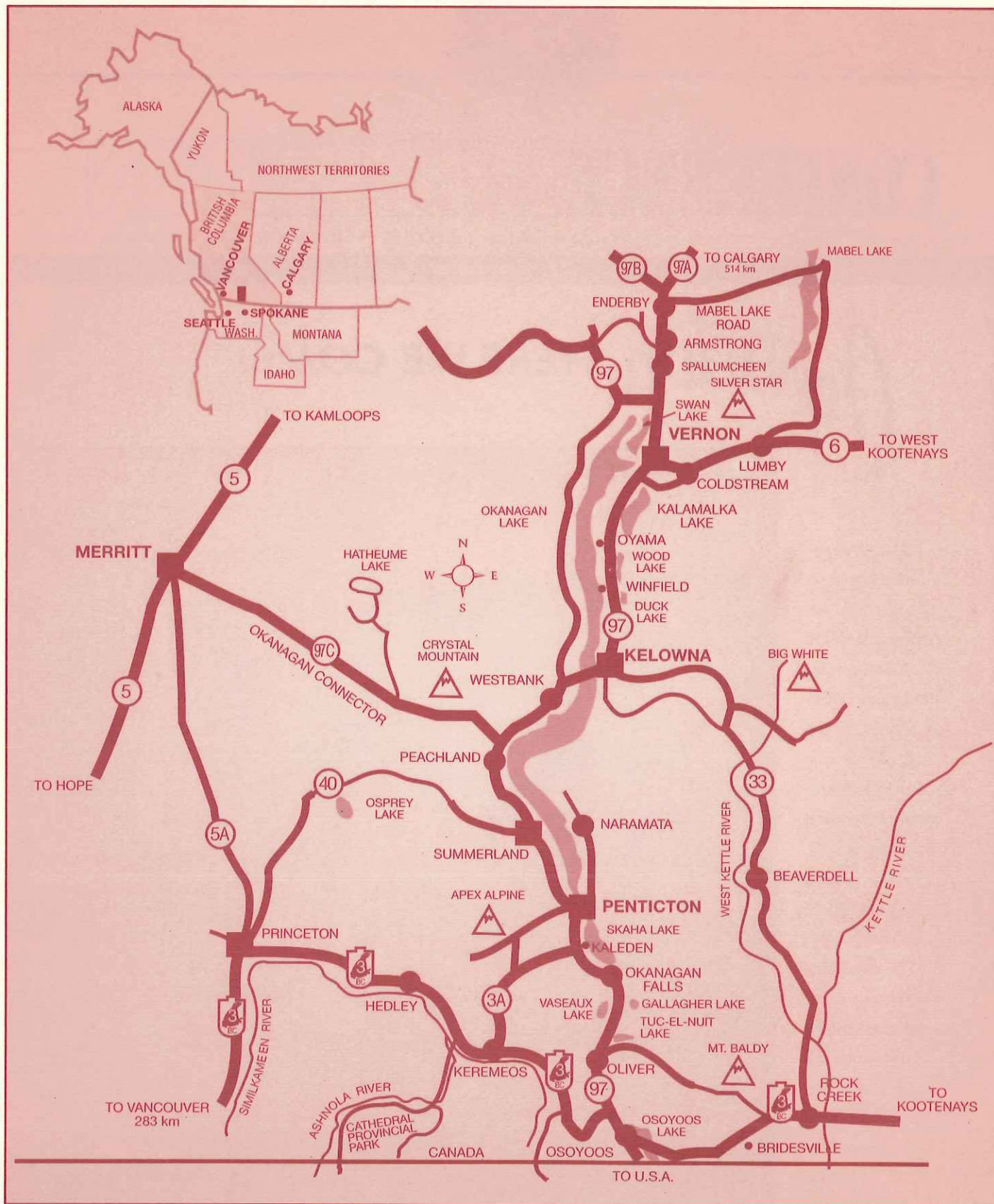
December 1995

## Penticton **HERE WE COME!**

Make arrangements now to attend our **39th Annual IDFTA Conference!**

Penticton, British Columbia is the host city for our upcoming extravaganza, scheduled for February 25-29, 1996. Provisions have been made to share a wealth of invaluable information, with several outstanding international speakers, plus educational tours and other activities.







## ACCOMMODATIONS

The Penticton Trade and Convention Center will host our 39th Annual Conference activities. **Special hotel accommodations have been made with the Clarion Lakeside Resort, which has rooms reserved for conference participants at \$63.00 per night.** We hope to have a shuttle bus running to the Trade and Convention Center. **Reserve your lodging early by calling the Clarion at 1-800-663-9400 or 604-493-8221.**

Other local hotels include:

|                        |   |
|------------------------|---|
| Sandman                | 1-800-SANDMAN<br>\$49.75(1-bed), \$54.75(2-bed) |
| Penticton Travel Lodge | 604-492-0225<br>\$44.00(1-bed), \$48.00(2-bed)  |
| Pilgrim House          | 1-800-854-7844<br>\$49.00/room                  |
| Penticton Inn          | 1-800-665-2221<br>\$59.00/room                  |

*Note: All accommodation prices are Canadian funds.*

## BANQUET

The annual conference banquet will be held Wednesday evening, February 28. Social hour starts at 6:00 p.m. and dinner will be served at 7:00 p.m. As a special treat, the Naramata Community Choir will be performing. This fine singing group, which was founded in 1962, will present a variety of classical and contemporary selections.

The cost of the banquet is \$27.00 (U.S.) per person. Please make reservations by filling out the registration form enclosed with this newsletter.

## BANQUET MENU

*Freshly Baked Dinner Rolls*

### Salads

Caesar  
Tossed Green  
Gourmet Pasta  
Fruit

### Vegetable Tray

### Cold Meat Tray

### Hot Dishes

Poached Whole Salmon  
on a decorated mirror  
Baron of Beef – carved by attending chef  
Pasta – selection/sauces  
Chicken – Roasted BBQ or Teriyaki  
Potato – Boiled, Roasted,  
Mashed or Scalloped  
Rice Pilaf  
Vegetable – Fresh in Season (2 types)

### Dessert

Cheese Cake / Squares  
Fresh Fruit Crisp

Coffee and Tea

## SPECIAL NOTICE

We've been advised that two IDFTA members received misprinted 1995 *Compact Fruit Tree* books. Due to an isolated bindery problem, pages 124 thru 131 were omitted. Please check your copy, if there's a problem, mail it to the Business Manager for a free replacement plus reimbursement of your shipping expense.



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# 1996 IDFTA CONFERENCE TOURS

## Okanagan Valley

The scenic Okanagan Valley is Canada's largest producer of apples for the fresh market, plus a vital area for commercial crops of pears, sweet cherries, peaches, apricots, plums and prunes.

The British Columbia fruit industry is going through some exciting times. Many growers have planted high density apple systems such as vertical axis, slender spindle and super spindle. New varieties such as Gala, Fuji and Braeburn have been widely planted and innovative techniques such as fertigation are common throughout the area.

Although apples are the dominant crop, new technology is being utilized on all crops, especially sweet cherries, where some high density trial plantings have been made.

**To make reservations, please fill out the registration form which is enclosed with this newsletter.**

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**ORCHARD TOUR.** Two days of tours—Tuesday, February 27 and Thursday, February 29—have been arranged by Mike Sanders and other contributors. The total cost is \$60.00 (U.S.) and the activities include orchard tours with tree densities ranging from 400 per acre to 4,000 per acre, pruning demonstrations involving French Axis, Slender and Super Spindle training systems and a variety of other exciting visitations. Lunch and transportation will be provided both days.

The **SPOUSES' TOUR**, scheduled for Tuesday, February 27, includes visits to the Summerland Research Station, the B.C. Orchard Industry Museum, plus a local winery and craft consignment store. Transportation and museum admission is included with your \$30.00 (U.S.) tour ticket; lunch is on your own.

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## ROBERT F. CARLSON DISTINGUISHED LECTURE

### To be Presented by Dr. Jim Flore

Born and raised on a fruit and vegetable farm in Southwestern Michigan, Jim attended Central Michigan University, and Michigan State University, and graduated with three degrees in Horticulture (B.S., M.S., and Ph.D. in 1975). Currently he is a Professor in the Department of Horticulture which he joined in 1974. Activities include: graduate and undergraduate teaching, research in fruit tree physiology, with considerable interaction with commodity groups in the state. Current research interests center around the effects of the environment on yield and quality in fruit crops with emphasis on photosynthesis and carbon partitioning. Past and present research projects include: the influence of light on yield and quality in cherry and peach, the effect of drought and flooding on performance in cherry, factors affecting cold hardiness of cherry and peach, environmental and biological damage thresholds for fruit crops, cause and prevention of cherry cracking, and IPM of whole orchard systems. He is a member of several plant science organizations; the American Society for Horticultural Science (past VP for research; and Associate Ed.), the International Society for Horticultural Science (current chair of the fruit section environmental physiology working group), and various other organizations. International travel has been extensive with study leaves in England, Italy, New Zealand, and Germany. Jim has been married to Elaine for 27 years, and has three girls: Leigh a senior at the University of Michigan, Katie a senior in high school, and Clare a 7th grader.

"Cherry Tree Physiology and Management" will be the topic of his discussion. Using the annual life cycle of cherry he will relate physiology to vegetative and reproductive growth throughout the season. Emphasis will be placed on physiological factors and management decisions that affect yield and quality in the current season, and in the following season. The discussion will include: cold hardiness, dormancy and chilling requirements; light interception and photosynthesis; fruit development, flower bud initiation; degree and timing of pruning; and drought and flooding. He will also discuss innovations that might be used in the future.



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## FEATURED SPEAKERS

### *Sharing a Wealth of Information and Experience*

**JEAN-MARIE LESPINASSE** from Bordeaux, France, is recognized around the world for his innovation and expertise in apple tree training. In 1962 he joined INRA (National Agricultural Research Institute) at the Bordeaux research center. His study of fruit quality in relation to position in the tree gave rise to a new concept in apple tree training-the vertical axis (also termed the French axe). In 1977 he published (titles translated from French to English) "Apple Tree Management, Classification of Fruiting Habit, Influence of Tree Training," and in 1980 "Apple Tree Management II, The Vertical Axis, The Renovation of Orchards." These are among the most significant papers recently published in pomology. In these articles, he classified apple varieties by fruiting and growth habit from spur types (Type 1) to tip bearers (Type 4) and emphasized the different pruning and training techniques required for each type. He developed the Solen tree training system for tip-bearing varieties. He and his colleagues are currently studying apple tree architecture and the inheritance of branching and fruiting habit in apple breeding populations. He will make two presentations in Penticton: "Orchard Management Techniques in France" and "Influence of Fruiting Habit on Pruning and Training of Apple Trees."

**DR. SABINE FRANKEN-BEMBENEK** from Giessen, Germany, is a world authority on dwarfing rootstocks for cherries. She received a doctoral degree in 1979 from the Institute for Genetics and Plant Breeding at Hanover University. At the Institute of Pomology at Giessen University, she has been a member of the cherry rootstock breeding team with Professor Gruppe. At Giessen University she has taught courses in pomology, plant breeding and vegetable production. Recently her responsibility has been the evaluation and summary of European data on the Giessen and other dwarfing cherry rootstocks. One of the dwarfing Giessen rootstocks has been released in Europe as Gisela 5 (Giessen 148-2). Dr. Franken-Bembenek will make two presentations at this year's IDFTA conference: "Giessen Cherry Rootstocks" and "Production of Sweet Cherries in Germany."

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**Editors Note:** Dr. Hiroo Koike, who was previously announced as a featured speaker at the upcoming conference, will be unable to attend due to a serious illness in his family. Another leading fruit-growing authority, **HIROMITSU KOMATSU** from Nagano, Japan will give a presentation entitled "Challenges of Growing Fuji Apples in Japan."

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## IDFTA CALENDAR

|                                |  |
|--------------------------------|--|
| June 23-25, 1996               | IDFTA Summer Tour, Michigan  |
| February 23-26, 1997           | 40th Annual IDFTA Conference, Rochester, New York                            |
| October 28 - November 12, 1997 | Japan Tree Fruit Study Tour and International Fuji Conference, Nagano, Japan |



# CONFERENCE PROGRAM

1996

## Registration in the Convention Center Lobby

Sunday, February 25 2:00 – 8:00 p.m.  
Monday, February 26 8:00 a.m. – 4:00 p.m.  
Wednesday, February 28 8:00 a.m. – Noon

### SUNDAY EVENING, FEBRUARY 25

#### British Columbia's Tree Fruit Industry

**Session Chairperson, Jake van Westen,  
IDFTA Board Member, Naramata, B.C.**

- 7:00 p.m. Fruit Growing in the Okanagan Valley—  
Climate, Soils, Acreage, Varieties, Rootstocks,  
Tree Density and Orchard Management  
Systems  
Tim Watson, Horticultural Specialist, B.C.  
Ministry of Agriculture, Fisheries and Food,  
Oliver, British Columbia
- 7:25 p.m. Innovative Pest Control Techniques—IPM to  
Sterile Insect Release  
Hugh Philip, Regional Entomologist, B.C.  
Ministry of Agriculture, Fisheries and Food,  
Kelowna, B.C.
- 7:50 p.m. Marketing B.C.'s Apples at a Profit for  
Growers—The Task of B.C. Tree Fruits Ltd.  
Greg Gauthier, General Sales Manager,  
B. C. Tree Fruits Ltd., Kelowna, B.C.
- 8:15 p.m. Okanagan Valley Tree Fruit Authority—  
Helping B.C. Orchardists Succeed  
Ross Husdon, Chief Executive Officer,  
Okanagan Valley Tree Fruit Authority,  
Summerland, B.C.

### MONDAY MORNING, FEBRUARY 26

**Session Chairperson, Dennis Courtier,  
IDFTA Board Member, Lake City, MN**

- 8:30 a.m. Welcome to the 39th Annual IDFTA  
Conference  
Darrel Oakes, IDFTA President, Lyndonville, NY

- 8:35 a.m. Program, Orchard Tour and Summer Tour  
Updates  
Dr. Bruce Barritt, IDFTA Education Director,  
Wenatchee, WA
- 8:40 a.m. Cherry Tree Physiology and Orchard Manage-  
ment Strategies—Now and in the Future  
**Robert F. Carlson Distinguished Lecture**  
Dr. Jim Flore, Michigan State University,  
East Lansing, MI
- 9:25 a.m. Challenges of Growing Fuji Apples in Japan  
Hiromitsu Komatsu, Nagano Tree Fruit  
Experiment Station, Nagano, Japan

#### STAND UP AND STRETCH

- 10:05 a.m. Ongoing Evolution of High Density Orchards  
in B.C.  
Moderator—Mike Sanders, Horticulturist, B.C.  
Ministry of Agriculture, Fisheries and Food,  
Kelowna, British Columbia  
Rob Dawson, Grower, Cawston, B.C.  
Stan Swales, Horticulturist, Vernon, B.C.  
David Gartrel, Grower, Summerland, B.C.
- Discussion led by Moderator
- 11:05 a.m. The Giessen Cherry Rootstocks  
Dr. Sabine Franken-Bembenek, Giessen,  
Germany

### MONDAY AFTERNOON, FEBRUARY 26

**Session Chairperson, Kent Waliser,  
IDFTA Board Member, Milton-Freewater, OR**

- 1:30 p.m. Apple Orchard Management Practices  
in France  
J. M. Lespinasse, Institut National de la  
Recherche Agronomique (INRA), Bordeaux,  
France



2:15 p.m. Dwarfing Cherry Rootstock Trials in North America

Moderator—Dr. Frank Kappel, Agriculture and Agri-Food Canada, Research Station, Summerland, British Columbia

Dr. Greg Lang, Irrigated Agriculture Research and Extension Center, Washington State University, Prosser, WA  
Dr. Ron Perry, Michigan State University, East Lansing, MI

Discussion led by Moderator

STAND UP AND STRETCH

3:15 p.m. Apple Rootstock Performance in B.C.

Dr. Harvey Quamme, Agriculture and Agri-Food Canada, Research Station, Summerland, British Columbia

3:35 p.m. Performance of Cornell-Geneva Apple Rootstocks in New York

Dr. Terence Robinson, New York Agricultural Experiment Station, Cornell University, Geneva, NY

4:05 p.m. Innovations in Sweet Cherry Production Systems—Vision for the Future

Moderator; Dr. Greg Lang, Irrigated Agriculture Research and Extension Center, Washington State University, Prosser, WA  
Bob Harris, Grower, Yakima, WA  
Hugh Dendy, Grower, Kelowna, B.C.

Discussion led by Moderator

**MONDAY EVENING, FEBRUARY 26**

**Fruit Growing Around the World**

**Session Chairperson, Dr. Steve Blizzard,  
IDFTA Board Member, Madera, CA**

7:00 p.m. European Orchard Management Techniques—  
Report of IDFTA 1995 European Tree Fruit  
Study Tour

Moderator; Geraldine Warner, Good Fruit Grower, Wenatchee, WA  
Tom Auvil, Horticulturist, Trout-Blue Chelan, Orondo, WA

Bernie Solymar, Ministry of Agriculture and Food, Simcoe, Ontario, Canada  
Kevin Bowman, Grower, Rexford, NY

Discussion led by Moderator

8:00 p.m. South African Fruit Industry

Tim Smith, Horticulturist, Washington State University Cooperative Extension, Wenatchee, WA

8:40 p.m. Japanese Fruit Growing

Karen Maib, Horticulturist, Washington State University Cooperative Extension, Othello, WA

**TUESDAY, FEBRUARY 27**

8:00 a.m. Orchard Tours

Buses depart from Convention Center for all-day orchard visits in the Summerland and Peachland districts.

5:00 p.m. Return to Convention Center

**WEDNESDAY MORNING, FEBRUARY 28**

**Session Chairperson, Darrel Oakes, IDFTA  
President and Board Member, Lyndonville, NY**

8:30 a.m. Influence of Fruiting Habit on the Pruning and Training of Apple Trees

J. M. Lespinasse, Institut National de la Recherche Agronomique (INRA), Bordeaux, France

9:15 a.m. Apple Orchard System Trials in New York

Dr. Terence Robinson, New York Agricultural Experiment Station, Cornell University, Geneva, NY

9:45 a.m. Production of Sweet Cherries in Germany

Dr. Sabine Franken-Bembek, Giessen, Germany

STAND UP AND STRETCH



10:25 a.m. Growing Apples in Nagano, Japan  
Takanobu Nakamura, Grower, Nagano, Japan

10:35 a.m. Managing Tatura Trellis and Other Angled Canopy Tree Training Systems with Apples  
Moderator—Rick Maib, Orchardist, Royal City, WA

Tom Waliser, Walla Walla, WA  
Eric Swanson, Yakima, WA  
Tom Carnevali, Wapato, WA  
Mike Robinson, Vantage, WA

Discussion led by Moderator

11:35 a.m. When Does Tree Stress Most Critically Affect Apple Fruit Quality and Yield?  
Dr. Jim Flore, Michigan State University, East Lansing, MI

### WEDNESDAY AFTERNOON FEBRUARY 28

*Session Chairperson, Fritz Wafler,  
IDFTA Board Member, Wolcott, NY*

1:30 p.m. Pomology 101—Managing the Orchard Environment  
Dr. Curt Rom, University of Arkansas, Fayetteville, AR

2:10 p.m. Modifying the Orchard Environment for Success with Fuji—Orchard Covers for Shade, Overtree Cooling to Reduce Sunburn, Undertree Reflective Materials and Fruit Bagging to Improve Color  
Moderator—Karen Maib, Horticulturist, Washington State University, Cooperative Extension, Columbia Basin, WA  
Jim Fleming, Fleming's Valley View Orchards, Quincy, WA  
Gordon Lowell, Beverly Orchards, Mattawa, WA  
Warren Morgan, Double Diamond Fruit Co., Quincy, WA

Tom Waliser, Walla Walla, WA  
Charlie de la Chapelle, 7 C's Orchard, Sunnyside, WA

Discussion led by Moderator

### STAND UP AND STRETCH

3:10 p.m. Latest Developments in Apple Production and Management in Japan  
Hiromitsu Komatsu, Nagano Tree Fruit Experiment Station, Nagano, Japan

3:55 p.m. Performance of High Density Apple Orchards in Michigan—A Prelude to the 1996 Summer Tour in Michigan  
Moderator—Phil Schwallier, Extension Horticulturist, Clarksville Horticultural Experiment Station, Clarksville, MI  
Kevin Winkel, Hartford, MI  
Steve Klackle, Greenville, MI  
Bruce Rasch, Ada, MI

Discussion led by Moderator

6:00 p.m. Social Hour, Convention Center

7:00 p.m. Awards Banquet  
Master of Ceremonies, Dr. Steve Blizzard, IDFTA Board Member, Madera, CA  
Presentation of IDFTA Grower, Extension and Research Awards  
Entertainment by the Naramata Community Choir

### THURSDAY, FEBRUARY 29

8:00 a.m. Orchard Tours  
Bus departure from Convention Center for all-day orchard visits in the Kaleden and Oliver districts.

5:00 p.m. Return to Convention Center





# CONFERENCE BULLETIN

37th Annual IDFTA Conference • February 27 - March 2, 1994 • Grand Rapids, Michigan

IDFTA • IDFTA • IDFTA • IDFTA • IDFTA



Once again, arrangements have been made for another exceptional conference. We've lined up a program that will give you information that will benefit you for the rest of your fruit-growing careers.

## PROGRAM

The 37th Annual IDFTA Conference will be held February 27 through March 2, 1994, at the Amway Grand Plaza Hotel in Grand Rapids, Michigan.

We're kicking off the conference Sunday evening with Michigan State University's research and extension faculty, speaking on *Adopting New Technology in the Michigan Tree Fruit Industry*.

The Robert F. Carlson Distinguished Lecture, *New Wave of Apple Rootstocks*, will be presented on

Monday morning by Dr. Jim Cummins, Cornell University apple rootstock breeder.

We've scheduled an all-day tour to five outstanding orchards where you'll learn about a variation on the HYTEC system type of training, trials using plastic bags to help promote branches, numerous plantings on 26's, 9's and Mark's with Galas and many other varieties, and growth regulator trials for thinning and fruit size enhancement.

## ACCOMMODATIONS

The conference will be headquartered at the Amway Grand Plaza Hotel, Pearl at Monroe, Grand Rapids, Michigan 49503.

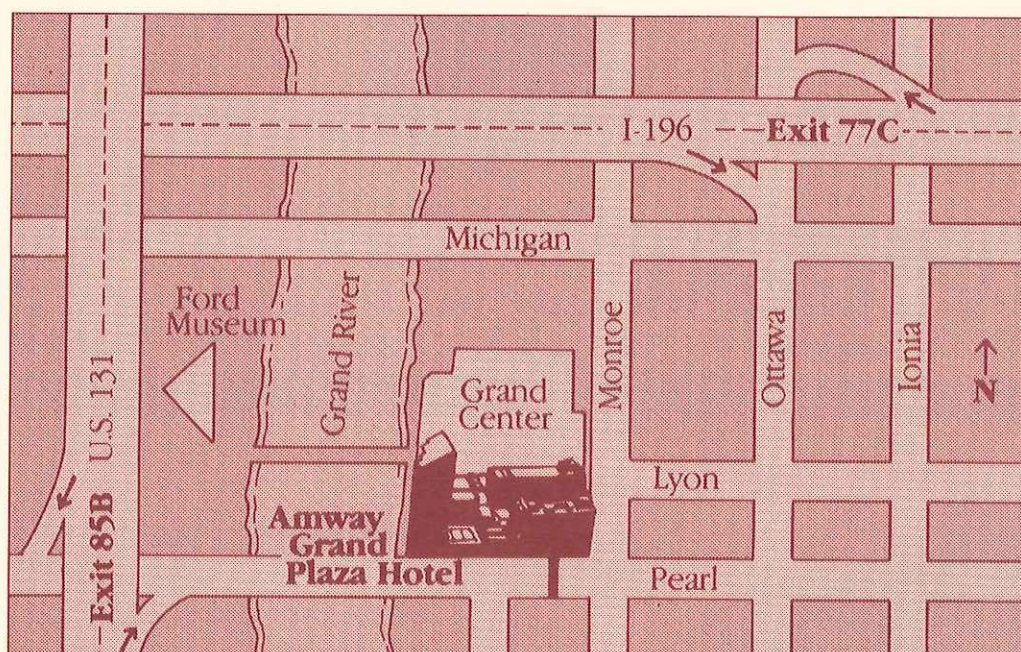
The Amway Grand Plaza is within walking distance of the Gerald Ford Museum. There are nine restaurants within the hotel complex that offer everything from nightly entertainment and cheery cafes, to award-winning cuisine and skyscraper views. The restaurants offer some of the best dining in West Michigan.

The Grand Center, with skywalk access, also houses a 2,448-seat performing arts theater and a 4,000-seat arena.

For those of you who want to work-off all that wonderful food you'll be served, you can enjoy an invigorating swim in their heated pool or relax in the whirlpool or sauna. Tennis courts, racquetball courts, a sun deck, and a room full of exercise equipment are yours to use as well.

Located in the heart of downtown Grand Rapids, there is direct airline service to and from 50 major cities at the Kent County International Airport, which is less than 20 minutes from the hotel. ►





## **RATES & RESERVATIONS**

Rooms have been reserved for the IDFTA, but your prompt response in making reservations will be necessary to ensure that you have a room. All reservations must be received by January 31, 1994. Any reservations received after that date will be accepted on a space available basis and may be subject to regular hotel rates.

Special convention rates have been arranged and are as follows:

- Single . . . . \$73.00
- Double . . . \$73.00
- Triple . . . . \$83.00 (2 beds)
- Quad . . . . \$93.00 (4 people, 2 beds)

Room reservations are to be made directly with the Amway Grand Plaza. The phone number for reservations is 1-800-253-3590.

## **BANQUET**

The annual conference banquet will be held on Monday evening, February 28. Social hour is from 6:30 p.m. to 7:30 p.m., and dinner will be served at 7:30. We will be enjoying Hickory Grilled, Cider Marinated Chicken Breasts, and Apple Pie.

The cost of the banquet is \$25.00 per person. Please make your reservations by filling out the registration form enclosed with this newsletter.

## 1994 CONFERENCE TOURS

**Wednesday, March 2, 1994 • 8:30 a.m.**

Klackle Orchards • *Greenville*

Triple H Farms (Hessler Farms) • *Belding*

Bruce and Joe Rasch Farms • *Ada*

Bastian and Anne Blok • *Ada*

Clarksville Horticultural Experiment Station • *Clarksville*



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Monday, February 28

## 1994 IDFTA CONFERENCE LADIES TOUR

### ABOUT THE LADIES TOUR

The ladies tour is scheduled to take-off on Monday morning at 8:30 a.m. The cost of the tour is \$28.00 which includes transportation and a wonderful lunch.

It is sponsored by the Michigan Apple Promoters, which is a group of ladies from the Grand Rapids area whose goals are to promote and educate consumers on the varieties and versatility of Michigan apples.

- 8:30 am Leave Amway Grand Plaza in Grand Rapids.
- 9:00 am Arrive **Robinette Apple Haus and Gift Barn** — This operation is owned by Jim and Bethel Robinette. It is entirely retail and consists of a cider mill, apple market and bakery. The bakery sells desserts such as pies, doughnuts, and other calorie-enriched goodies. The market sells cider, jams and jellies, nuts, dried fruits, and of course, apples. The Robinette's also have a Gift Barn as a part of their market. Here they sell quilts, bedding, lace, dried flowers, gifts, collectibles, unfinished furniture and handmade baskets. This is a very unique farm market and an interesting place to have a cup of coffee and a doughnut, and browse through their many wares.
- 11:00 am Arrive at **Kropf's Orchard and Storage** — Here we will tour their apple packing facility

and learn about the 10 CA storages and the new 200-foot packing line they have just installed. This line has the capacity to pack 30 bins per hour or 250 bins per day. It also has a computerized weight sizer with a new cup and color sort, and can pack two to three different sizes of apples at a time. Above all this, it's quiet!

- 11:45 am Leave Kropf's and travel to lunch.
- 12:30 pm Arrive at **The Crossbow** for lunch. The building that is now The Crossbow was first built as a 4-H campground facility. This banquet hall has windows overlooking Bostwick Lake. They are well-known for their homemade bread, rolls and meals. A buffet-style meal will be prepared specially for our tour group. After lunch there will be a short slide presentation by the Michigan Apple Promoters (MAP) in which they will summarize some of the activities they have been doing to promote Michigan apples. MAP will also have some of the materials and products that they use available at this time.
- 2:30 pm Leave The Crossbow and travel back to the Amway in Grand Rapids.
- 3:00 pm Arrive at the Amway in Grand Rapids.

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Wednesday, March 2

## 1994 IDFTA CONFERENCE ORCHARD TOUR

### ABOUT THE ORCHARD TOUR

The orchard tour is scheduled to take-off on Wednesday morning at 8:30 a.m. The cost of the tour is \$25.00 which includes transportation and lunch.

Our first stop will be **Klackle Orchards, Greenville**. Steve Klackle has been operating this 500-acre farm for eight years. He recently has been updating the orchards with additional plantings of high density blocks. A recent planting includes a variation on the HYTEC system type of trailing with rootstocks and varieties of M9 and Golden Supreme and Jonagold. Steve is an

outstanding horticulturist with the adoption and adapting of his variation of the HYTEC training system with tree leaning and leader snaking techniques.

Steve's main block includes 200 acres plus planted in the late 1970's by Steve's father, the late Ray Klackle (second IDFTA president), in Greenville. These blocks include Jonamac, Empire, Red Delicious and others on 7's and 106's. More recent plantings are on 26's and 9's.

The next stop we will be making is at **Triple H Farms (Hessler Farms), in Belding**, which includes a new 100-acre block of outstanding vertical axis style ►



## 1994 ORCHARD TOUR *(Continued)*

trees at 600 trees-per-acre. The farm is a family operation with senior brothers Ted and Dave. Hessler's now include Ted's sons Steve and Eric, and son-in-law Mike Karaswicz. The vertical axis blocks planted in '90, '91, '92 and '93 include rootstock-variety combinations of Mark and 26 with Jonagold Decoster, Royal Gala, and Empire. Planting densities of 500 to 600 trees-per-acre in a 100-acre block are impressive to visit. The blocks are well cared for and very uniform.

The Hessler's have been running trials using plastic bags to help promote branches on the leaders of Empire. They have found the trees to respond significantly to the technique. Don't miss this stop.

Our next stop is at the **Bruce and Joe Rasch Farm** in **Ada**, and is a must visit. Bruce and Joe have been leading Michigan in their rapid adoption of high density with new varieties and rootstocks, being one of the first to plant major acreage of Galas. They have numerous strains on 9's, 26's and Mark.

These outstanding masters of high density apple orchards have over 300 acres of fruit on various training systems including vertical axis, free-standing V with their newest systems being the v-spindle and the double leaning T-bar trellis. Varieties include Fuji, BC#2, Yataka, Braeburn, Jonagold and Ginger Gold. Typical support systems include posts, single wire, some trees with training twine and much more.

We will then be going to see **Bastian and Anne Blok**, in **Ada**. The Blok's has been a tour stop for the IDFTA on eight previous tours. Bastian has long been in the high density orchard business. Densities of up to 1,000 trees-per-acre of slender spindles are common at Blok's. Bastian has made numerous trips to Europe to learn new techniques on high density systems.

He is also a master of the spindle and has numerous plantings on 26, 9 and Mark with Gala, Fuji, Braeburn, Elstar and many other varieties. He is considered one of the top apple growers of quality fruit in this district. Bastian likes to use a single wire at two feet with railroad ties for posts. This will be an interesting stop.


Our last stop will be at the **Clarksville Horticultural Experiment Station** in **Clarksville**. Dr. Ron Perry's system trial is a must visit. This NC-140 system planting has absolutely perfect training of slender spindle, vertical axis, HYTEC, and central leader apples. These are planted on various rootstocks used in the NC-140 planting across North America. Other systems also located at CHES include V-systems and V-spindle, and ultra high density apples at 16" spacing.

Other interests include tart cherry breeding, apple varieties, rootstock trials, growth regulator trials for thinning and fruit size enhancement. CA storage is done in the latest construction with the latest computer control machinery. Samples of the best tart cherry selections will be available.

## DR. JIM CUMMINS

*To Present the Annual*

## ROBERT F. CARLSON DISTINGUISHED LECTURE

 Dr. Jim Cummins, a Cornell University apple rootstock breeder, will speak about the *New Wave of Apple Rootstocks*. Jim has recently retired, following more than 25 years in research at the New York State Agricultural Experiment Station in Geneva. He remains active in the evaluation and release of Cornell-Geneva apple

rootstocks. Dr. Cummins will describe two newly released disease- and insect-resistant apple rootstocks, G.11 and G.30, in addition to the 1992 release, G.65. There is worldwide interest in the Cornell-Geneva apple rootstocks because of their resistance to fire blight, collar rot and woolly apple aphid.



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## OVERSEAS SPEAKERS

### *Sharing a Wealth of Information and Experience*

🌱 **DR. STUART TUSTIN**, a horticulturist with Hort Research in Havelock North, New Zealand, will present the New Zealand perspective on orchard management. Since 1984 he has conducted research in the Hawkes Bay fruit district to improve production efficiency and enhance fruit quality. Dr. Tustin's research on light interception and distribution, canopy physiology and canopy architecture led to the development of a new orchard system, the slender pyramid. He will summarize his research in a presentation entitled *Rootstock and Spacing Effects on Precocity, Yield, and Fruit Quality of Fuji Apple Using Slender Pyramid Tree Management*.

Dr. Tustin has studied fruit industries around the world and has helped put into perspective the effects of climatic factors and orchard management practices on fruit quality and marketing strategies. In a second presentation he will discuss *Future Directions of the New Zealand Apple Industry – a Hard Look into the Crystal Ball*. The New Zealand apple industry has been a trend-setter in terms of new apple varieties, so go the rest of the world's apple districts.

As a partner in a commercial orchard operation, Dr. Tustin has production experience with Gala, Braeburn

and Fuji. On the IDFTA program he will discuss the unique features of these new-to-North America varieties as they influence orchard management practices.

🌱 **DR. TONY WEBSTER**, a pomologist at Horticulture Research International (formerly the East Malling Research Station), will present the European perspective on dwarfing apple rootstocks. At East Malling since 1972, Dr. Webster's research has involved selection and development of plum and cherry rootstocks, including the introduction of Pixy and Colt. Since 1982 his research has included the evaluation and selection of apple rootstocks from the East Malling rootstock breeding program as well as from other breeding programs. He will summarize his work in the presentation *European and East Malling Rootstock Research – New and Promising Apple Rootstocks*.

How do apple rootstocks influence such critically important factors as tree size, productivity and fruit quality? Dr. Webster will discuss these tree physiology questions in a second presentation, *Rootstock Effects on Tree Growth, Precocity, Yield Efficiency and Anchorage*.

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## CONFERENCE PROGRAM

### Registration at the Hotel's Center Concourse Area

Sunday, February 27

2:00 - 5:00 pm

7:00 - 8:30 pm

Monday, February 28

8:00 am - 5:00 pm

Tuesday, March 1

8:00 am - 5:00 pm

### 🌱 SUNDAY EVENING, FEBRUARY 27 🌱

#### *The Michigan Tree Fruit Industry — Adopting New Technology*

7:30 *The Michigan Fruit-growing Environment —  
Climate, Soils, Topography, Limiting Factors  
and Districts*

Mark Longstroth, District Horticultural Agent,  
Paw Paw, MI

7:50 *Changing Apple Production Practices —  
Orchard Systems, Rootstocks and Varieties*  
Phil Schwallier, District Horticultural Agent  
and Clarksville Horticultural Experiment  
Station Coordinator, Clarksville, MI

8:10 *IPM and Spray Technology — Now and in  
the Future*

Gary Thornton, District IPM Agent,  
Northwest Michigan Horticultural  
Experiment Station, Suttons Bay, MI ▶



- 8:30 *Competitive Marketing of Michigan Apples*  
Donald Ricks, Department of Agricultural  
Economics, Michigan State University, East  
Lansing, MI
- 8:50 *Michigan State University — Preparing  
Students and Developing New Technology for  
the Tree Fruit Industry*  
Dr. Jim Flore, Department of Horticulture,  
Michigan State University, East Lansing, MI

## 🐼 MONDAY MORNING, FEBRUARY 28 🐼

**Session Chairperson, Darrell Oakes,  
Vice President, IDFTA, Lyndonville, NY**

- 8:30 *Welcome to the 37th Annual IDFTA  
Conference*  
Jack Pheasant, President, IDFTA, East  
Wenatchee, WA
- Program and Orchard Tour Update*  
Bruce Barritt, IDFTA Education Director,  
Wenatchee, WA
- 8:35 *New Wave of Apple Rootstocks*  
**Robert F. Carlson Distinguished Lecture**  
Dr. Jim Cummins, New York State  
Agricultural Experiment Station, Cornell  
University, Geneva, NY
- 9:20 *Making Apple High Density Orchard Systems  
Work — "V" and "Y" Angled Trellis Systems*  
*Introduction and Panel Moderator*  
Dr. Terence Robinson, New York State  
Agricultural Experiment Station, Cornell  
University, Geneva, NY
- Tatura Trellis*  
Bas van den Ende, Horticulturist, Naumes,  
Inc., Medford, OR
- Y-Trellis and Güttinger-V*  
Joe Nicholson, Grower, Geneva, NY
- Double-row Angled Canopy*  
Bruce Rasch, Grower, Ada, MI
- Mini-Tatura Trellis*  
Tom Auvil, Grower and Fieldman, Orondo,  
WA
- Discussion and Audience Questions

SHORT STRETCH BREAK — MEET YOUR NEIGHBOR

- 10:30 *European and East Malling Rootstock  
Research — New and Promising Apple  
Rootstocks*  
Dr. Tony Webster, Horticultural Research  
International, East Malling, England
- 11:15 *Rootstock Effects on Apple Flower Formation*  
Peter Hirst, Ohio Agricultural Research and  
Development Center, Ohio State University,  
Wooster, OH
- 11:30 *Trees on Mark Rootstock — Making Them  
Grow*  
Kent Waliser, JDI Fruit Co., Milton-Freewater,  
OR
- 11:45 *IDFTA Business Meeting*

## 🐼 MONDAY AFTERNOON, FEBRUARY 28 🐼

**Session Chairperson, Dennis Courtier,  
IDFTA Board Member, Lake City, Minnesota**

- 1:30 *Pomology 101: Balancing Tree Growth and  
Cropping — Which Should Come First,  
Apples or Canopy Development?*  
Dr. Curt Rom, University of Arkansas,  
Fayetteville, AR
- 2:10 *Orchard Management Challenges with the  
New Varieties Gala, Fuji and Braeburn*  
Dr. Stuart Tustin, Horticulturist and Grower,  
Havelock North, New Zealand
- Joe Rasch, Grower, Ada, MI
- Tom Waliser, JDI Fruit Co., Milton-Freewater,  
OR
- Mitch Lynd, Grower, Pataskala, OH
- Discussion and Audience Questions  
Moderated by Dr. Stuart Tustin

SHORT STRETCH BREAK — MEET YOUR NEIGHBOR

- 3:15 *Orchard Systems — Selecting the "Right"  
One*  
*Introduction by Discussion Leader*  
Dr. Dave Ferree, Ohio Agricultural Research  
and Development Center, Wooster, OH
- Michigan NC-140 Orchard Systems Trial with  
Empire and Jonagold*  
Dr. Ron Perry, Michigan State University, East  
Lansing, MI
- Orchard Management System Trials in New  
York*  
Dr. Terence Robinson, New York State  
Agricultural Experiment Station, Cornell  
University, Geneva, NY



*Is High Density Right for Every Grower and Every Variety?*

Dr. George Greene, Pennsylvania State University, Department of Horticulture, Fruit Research Laboratory, Biglerville, PA

*Is the System Critical, or Does It Really Matter?*

Steve Hoying, Area Extension Specialist, Cornell University, Newark, NY

Discussion and Audience Questions

## 🌱 MONDAY EVENING, FEBRUARY 28 🌱

6:30 Social Hour

7:30 Awards Banquet

Master of Ceremonies, Dr. Steve Blizzard, Texas Hill Country Orchards Ltd., Kerrville, TX

Presentation of IDFTA Grower, Extension and Research Awards

Banquet Address

*Future Directions for the New Zealand Apple Industry — A Hard Look Into the Crystal Ball*

Dr. Stuart Tustin, Hort. Research, Havelock North, New Zealand

## 🌱 TUESDAY MORNING, MARCH 1 🌱

**Session Chairperson,**

**Harold Schooley, IDFTA Board Member, Windham Centre, Ontario**

8:30 *Rootstock Physiology — Understanding the Effects of Rootstocks on Tree Growth, Precocity, Yield Efficiency and Anchorage*

Dr. Tony Webster, Horticultural Research International, East Malling, England

9:00 *Research with New Dwarfing Apple Rootstocks*

*Introduction by Discussion Leader*

Dr. Tony Webster, Horticultural Research International, East Malling, England

*Performance After 7 Years of 20 Dwarfing Rootstocks with Golden Delicious, Granny Smith and Delicious in Washington*

Dr. Bruce Barritt, Tree Fruit Research and Extension Center, Washington State University, Wenatchee, WA

*Performance After 7 Years of 20 Dwarfing Rootstocks with MacSpur and Lawspur Rome in Ohio*

Dr. Dave Ferree, Ohio Agricultural Research and Development Center, Wooster, OH

*Water Stress Factors and Apple Rootstock Performance*

Dr. Tom Fernandez, Michigan State University, East Lansing, MI

*Apple Rootstock Effects on Fruit Maturity, Quality and Storage Life*

Dr. Wes Autio, University of Massachusetts, Amherst, MA

*Rootstock Performance in Michigan*

Dr. Ron Perry, Michigan State University, East Lansing, MI

Discussion and Audience Questions

SHORT STRETCH BREAK — MEET YOUR NEIGHBOR

10:30 *Replant Experience with High Density Orchards of Jonathan and Golden Delicious on M.26 — Fumigation and Fertigation Factors*

Dr. Curt Rom, University of Arkansas, Fayetteville, AR

10:50 *Geneva Apple Rootstock Introductions Challenge M.9, M.26 and M.7*

Dr. Jim Cummins, New York State Agricultural Experiment Station, Cornell University, Geneva, NY

*Rootstock and Spacing Effects on Precocity, Yield and Fruit Quality of Fuji Apple Using Slender Pyramid Tree Management*

Dr. Stuart Tustin, Horticultural Research, Havelock North, New Zealand

## 🌱 TUESDAY AFTERNOON, MARCH 1 🌱

**Session Chairperson, Dr. Steve Blizzard, IDFTA Board Member, Kerrville, Texas**

***Crop Load Management — Key to Success in High Density Orchards***

1:30 *Pomology 102: Effect of Orchard Practices on Flowering and Fruit Set of Deciduous Fruit Trees*

Dr. Frank Dennis, Michigan State University, East Lansing, MI

2:15 *Chemical Thinning — Factors Influencing Success and New Thinning Agents*

Dr. Max Williams, USDA-ARS, Wenatchee, WA

SHORT STRETCH BREAK — MEET YOUR NEIGHBOR





- 3:00 *Making High Density Orchard Systems Work*  
— *Central Leader Systems*  
*Introduction and Panel Moderator*  
Dr. Curt Rom, University of Arkansas,  
Fayetteville, AR  
*Vertical Axis with Bags to Stimulate Branching*  
Mike Karasiewicz, Grower, Belding, MI  
*Snaking the Central Leader*  
Steve Klackle, Grower, Greenville, MI  
*Pedestrian Spindle Orchard*  
Kevin Winkel, Grower, Hartford, MI  
*Central Leader Vertical Trellis*  
Ted Alway, Wells and Wade Fruit Co.,  
Wenatchee, WA  
Discussion and Audience Questions
- 4:15 *Innovative Over-the-Row Sprayer for Intensive Apple Orchards*  
Darrell Oakes, Grower, Lyndonville, NY

## 🌱 TUESDAY EVENING, MARCH 1 🌱

**Jointly sponsored by the  
American Pomological Society and the  
International Dwarf Fruit Tree Association**  
**Session Chairperson, Dr. Rob Crassweller,  
American Pomological Society  
Business Manager,  
Pennsylvania State University,  
University Park, PA**

- 7:00 *The American Pomological Society's Evening on Apple Cultivar Development and Evaluation*  
Dr. Robert A. Norton, President, American Pomological Society, Washington State University, Mt. Vernon, WA
- Developing New Apple Cultivars***
- 7:05 *Apple Breeding for Arkansas and the South*  
Dr. Curt Rom, University of Arkansas, Fayetteville, AR
- 7:15 *Apple Cultivar Development in Eastern Canada*  
Dr. Raymond Granger, Agriculture Canada Research Station, St.-Jean-sur-Richelieu, Quebec
- 7:25 *Apple Breeding: Objectives, Strategies and Successes*  
Dr. Susan Brown, New York State Agricultural Experiment Station, Cornell University, Geneva, NY

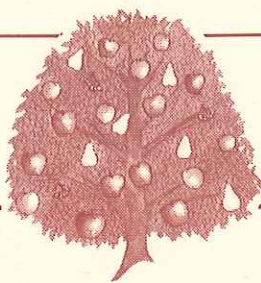
## ***Picking the Potential Stars from Among New Apple Selections and Cultivars — What's Beyond Braeburn, Empire, Fuji, Gala and Jonagold?***

- 7:50 *Introduction and Panel Moderator*  
Dr. Rob Crassweller, Department of Horticulture, Pennsylvania State University, University Park, PA  
*Western Prospective*  
Dr. Robert A. Norton, Washington State University, Mt. Vernon, WA  
*Midwest Prospective*  
Dr. Jerry Hull, Michigan State University, East Lansing, MI  
*New York Prospective*  
Dr. Susan Brown, NYAES, Cornell University, Geneva, NY  
*Mid-Atlantic Prospective*  
Dr. George Greene, Pennsylvania State University, Biglerville, PA  
*Eastern Canada Prospective*  
Dr. Raymond Granger, Agriculture Canada Research Station, St.-Jean-sur-Richelieu, Quebec  
*Southern Prospective*  
Dr. Curt Rom, University of Arkansas, Fayetteville, AR  
*New England Prospective — A National Evaluation Program*  
Dr. Duane Greene, University of Massachusetts, Amherst, MA  
Discussion and Questions
- 9:00 *Informal Apple Cultivar Display*  
Coordinated by Dr. Jim Flore, Michigan State University, East Lansing, MI

## 🌱 WEDNESDAY, MARCH 2 🌱

- 8:30 All-day orchard visits to nearby apple orchards and the Michigan State University Clarksville Horticultural Experiment Station. Included will be double-row angled canopies, vertical axis, Güttinger-V, HYTEC and slender spindle with several rootstocks and with Empire, Jonagold, Gala and Fuji.





EDUCATIONAL DIRECTOR  
Bruce H. Barritt  
1100 N. Western Avenue  
Wenatchee, WA 98801

(509) 663-8181 (office)  
Ext. 233  
(509) 664-0526 (FAX)

BUSINESS DIRECTOR  
Charles J. Ax, Jr.  
14 South Main Street  
Middleburg, PA 17842

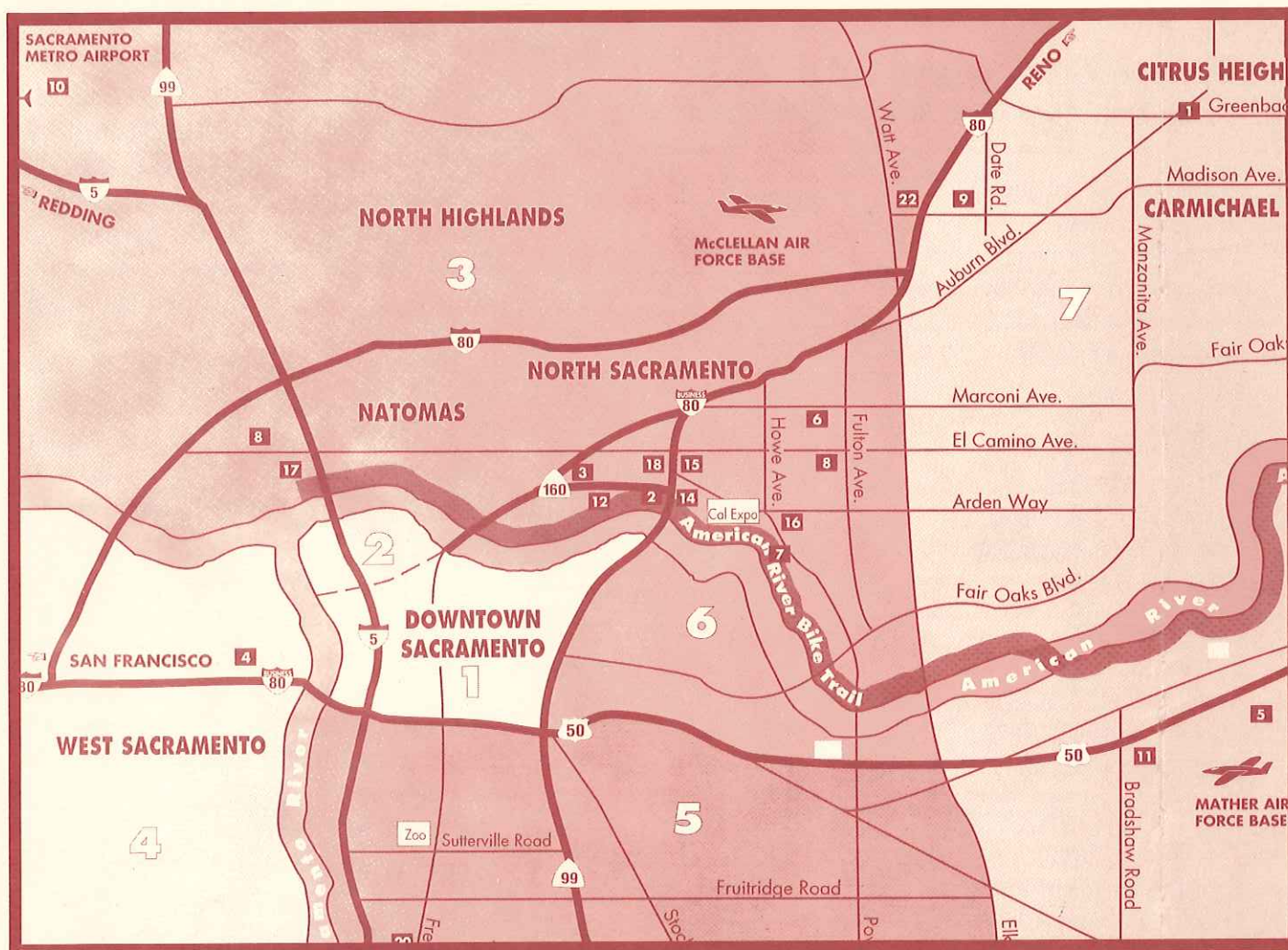
(office) (717) 837-1551  
(home) (717) 539-8300  
(FAX) (717) 837-0090

# COMPACT NEWS

A Periodic Newsletter of the International Dwarf Fruit Tree Association

No. 2

May 1994



## CALIFORNIA, HERE WE COME!

As I'm sure you all know, we're going to Sacramento, California for our 1994 IDFTA Summer Tour. Sacramento is a city with a great historical heritage and rich ethnic diversity, but also a city in tune with the future, offering endless possibilities for an exciting and stimulating visit.

The tour we have planned for you is just as rich and

exciting. We hope each and every one of you will be able to attend and benefit from the new knowledge you'll gain from the many orchard visits we'll be making. We'll visit everything from the oldest commercial Fuji plantings in the U.S. to overhead cooling systems to reduce fruit sunburn. Don't miss it!



**WHERE:**

Sacramento, California

**WHEN:**

Sunday, June 19 through Tuesday, June 21

**ACCOMMODATIONS:**

All accommodations are located at I-5 exit East Richards Boulevard just north of downtown Sacramento (one mile from historic Old Sacramento) and 10 miles south of the Sacramento airport. Participants should make their own reservations.

*Headquarters Hotel for registration and bus departures with five excellent restaurants nearby and free airport shuttle:*

FOUNTAIN SUITES HOTEL  
321 Bercut Drive  
Sacramento, CA 95814  
Reservations: 1-800-767-1777  
Phone: (916) 441-1444  
FAX: (916) 441-6530

*Nearby hotels (within one block):*

GOVERNOR'S INN  
210 Richards Blvd.  
Sacramento, CA 95814  
Phone: 1-800-999-6689  
(916) 448-7224

DISCOVERY INN  
350 Bercut Drive  
Sacramento, CA 95814  
Phone: 1-800-952-5516  
(916) 442-6971

SUPER 8 EXECUTIVE SUITES  
216 Bannon Street  
Sacramento, CA 95814  
Phone: (916) 447-5153

**REGISTRATION**

Registration forms are enclosed with this newsletter and must be received by June 6, 1994. Late registration forms will be accepted until June 15. There will be a \$10.00 penalty for any registrations received after June 15. Due to the bus company's policy, there will be no refunds.

The total cost for members is \$90.00 which includes registration, bus trips and lunches for both Monday and Tuesday. The cost for non-members is \$115.00.

Please sign up *now*. You'll be glad you did.

**ITINERARY****SUNDAY, JUNE 19**

3-8 P.M. — Registration, Fountain Suites Hotel

7 P.M. — *Overview of the California apple, pear and stone fruit industries*, Dr. Warren Micke and Dr. Steve Southwick, Department of Pomology, University of California, Davis

**MONDAY, JUNE 20**

8 A.M. — Buses depart from the Fountain Suites Hotel for all-day orchard visits in the Stockton area south of Sacramento. Orchard stops will feature the oldest commercial Fuji plantings in the U.S., high density Fuji and Gala on M.26, Mark and M.7 with freestanding central leader trees, vertical trellis and Tatura trellis systems.

We will be lunching at Waterloo Gun and Bocci Club (near Stockton). Our menu consists of Baked Chicken, Italian Pasta, Tossed Green Salad with Dressing, French Bread with Butter, and a Dessert. Drinks include Soda, Iced Tea, or Coffee.

5 P.M. — Arrive back at Fountain Suites Hotel.

**TUESDAY, JUNE 21**

8 A.M. — Buses depart from Fountain Suites Hotel for all-day orchard visits in the Marysville area north of Sacramento. Orchard stops will feature apple and pear on Tatura trellis, Promalin to stimulate branching, overhead cooling to reduce fruit sunburn, moving the nursery to the orchard, sweet cherry central leader, Spanish bush and Tatura trellis systems, and rain covers for cherries.

We will have an International Buffet with the appropriate beverages for lunch today at Lucio's Restaurant, in Yuba City.

5 P.M. — Arrive back at Fountain Suites Hotel.

The tour buses we have contracted for our use on these tours are the best we could find. They come equipped with both air conditioning and restrooms.



# Pruning and Training Physiology

## Part I: Basic Growth Response

Stuart Tustin, Horticulture and Food Research Institute of New Zealand, Ltd.  
Havelock North, New Zealand

*This article appeared in the Proceedings of the Washington State Horticultural Association 87:50-63. 1991.  
Part II will appear in the next Compact News.*

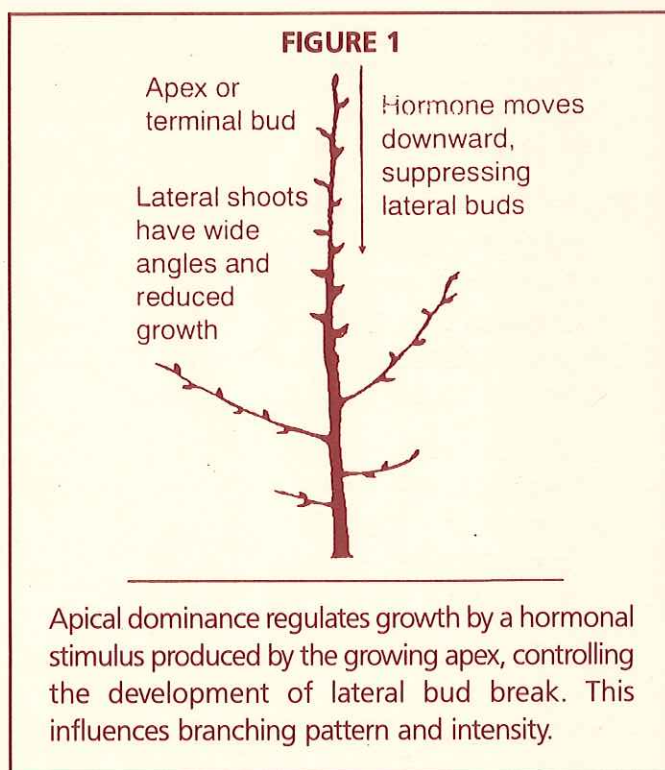
The objective of effective orchard tree management is to maximize fruit production while minimizing the growth of unproductive wood. Pruning and training are necessary cultural practices used to regulate the development and function of the tree canopy to encourage the production of fruit of marketable quality. In combination with other pomological practices, pruning and training influence tree development by the manipulation of the balance between vegetative growth and fruiting.

Pruning is the most interventionist management technique used in fruit production and directly or indirectly influences many physiological processes. Being such a drastic intrusion into normal tree development, the potential for spectacular responses is greater and is also highly dependent on pruning method. Pruning and training are influential during the establishment of young trees where maximizing precocity is a priority, as well as in maintaining highly productive canopies in mature orchards. While there are numerous methods of pruning and training in orchard management, there are fundamental plant responses which are common to all orchard systems and management styles. These include the regulation of shoot and root growth, control of fruit bud formation, fruit set and cropping. A good knowledge of the basic growth responses of fruit trees can provide orchardists with a clear understanding of the reasons for and likely results following particular tree management practices. Such knowledge will also permit the orchardist to make appropriate pruning and training decisions for any type of tree in any situation.

### BASIC GROWTH RESPONSES

There are several basic plant growth responses which directly influence the effects of pruning and training. These include:

- apical dominance
- gravimorphic responses
- vegetative growth-fruiting balance
- growth and fruiting habit of the cultivar.



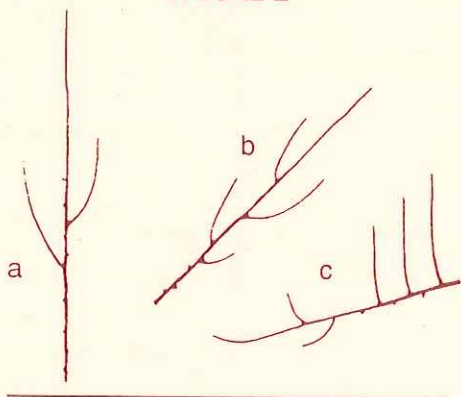
### APICAL DOMINANCE

Tree form and size are determined by the rate of growth of shoots and the number and pattern of branches. The relative pattern of growth and branching is largely determined by the phenomenon of apical dominance in which the apical buds of shoots dominate growth and control the development of lateral buds lower on the shoot (Figure 1). It is thought that the hormone auxin is produced in quantity by the earliest active buds, stimulating ►



the development of better vascular connections and thus developing preferential accumulation of nutrients, growth regulators and photoassimilates. In this way these apical buds become dominant. It has also long been thought that the auxin produced by active apical buds moves down the shoot by gravity and inhibits the development of lateral buds, the effect becoming weaker with increasing distance from the shoot apex. As buds become more distant from the growing apex, they are released from the auxin influence and may develop as lateral shoots. The intensity of apical dominance varies among species and cultivars, typically being very strong in apple and pear, while peach is notably less apically controlled. The degree of apical control therefore regulates the rate of terminal shoot growth, the distribution of lateral shoots and the length and branch angles of these laterals as they emerge from the terminal shoot.

FIGURE 2



Limb orientation modifies the effect of apical dominance. Vertical shoots are most strongly apically dominant and branch sparsely (a). At flatter angles terminal shoot vigor is reduced and lateral branching is increased (b). Branches below horizontal lose apical dominance and develop vertical watersprouts.

### GRAVIMORPHIC RESPONSE

Gravimorphic response is a function of the modification to apical dominance by the orientation of the limb (Figure 2). Apical dominance is strongest in vertical shoots where auxin moves downward and accumulates uniformly in lateral buds while cytokinins (a hormone produced in the roots) move upward to the uppermost parts of the limb. Cytokinins are responsible for stimulating the release of buds from dormancy. Consequently in vertical shoots,

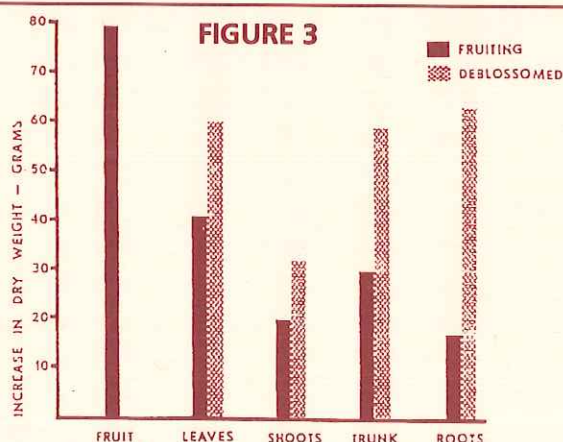
vigorous growth occurs only near the terminal bud, with little lateral shoot development further down the shoot. As shoots are oriented away from the vertical, distribution of growth regulators in the limb is no longer uniform or concentrated in the terminal region, resulting in an increase in the number and length of lateral shoots along a limb and reduced growth of the terminal shoot. If limbs are arched below the horizontal, apical dominance by the apical bud is lost. Auxin accumulates in the lower side of the limb and cytokinins accumulate in the uppermost buds on the curve of the limb. These buds, which are no longer under any apical control, develop into new upright shoots as the tree seeks to reestablish apical control in the limb.

The general gravimorphic response to branch bending away from the vertical is for reduced shoot growth and increased flowering in fruit trees. Consequently, branch bending can have a profound effect on precocity, fruiting and yield.

### VEGETATIVE GROWTH-FRUITING BALANCE

In fruit trees, vegetative growth and fruiting are competitive processes so that there is a dynamic balance operating which affects plant development. Classical studies using deblossoming treatments have demonstrated that fruiting reduces vegetative growth. This effect has been recorded across different rootstocks, independent of previous cropping and pruning and across variable climates.

FIGURE 3



Increase in weight of the parts of cropping and non-cropping trees in one season of growth (Maggs, 1963).

Using dry weight partitioning studies, the nature of the fruiting effect on vegetative growth has been described (Maggs, 1963) (Figure 3). The reduction of growth ►



caused by fruiting in a single season is disproportionately distributed over the parts of the tree. The least reduction occurred in the leaves, while larger proportional reductions occurred in the branches and trunk. By far the greatest proportional reduction in growth occurs in the roots. This indicates that plant parts most distant from the leaves are least competitive for products of photosynthesis. While fruiting substantially reduces the vegetative increment of the tree, it does not appear to have a major effect on the apportionment between vegetative parts. Fruit seem to act as an independent growth center capable of attracting a proportion of the assimilate because of favorable proximity to leaves. The remainder is then distributed in roughly the same proportions as in a non-fruiting tree. The effects of a heavy crop can be explained simply as a more reduced supply of photosynthate into the translocation system of the tree. Thus the plant parts which normally receive the smallest allocation such as the roots are most affected.

### BASIC RESPONSES TO PRUNING

Because pruning intervenes in the natural progression of growth and development of trees, the effects will be manifest through reactions in the basic growth processes described above.

The effect of pruning is to remove or alter apical dominance of a branch by the removal of a number of growing points (apices). The response is to stimulate growth in the vicinity of the cut, which can be explained by physiological events.

Most tree species develop some proportional ratio between root and shoot mass. Pruning acts to alter this equilibrium so that the response is to restore the balance by renewed growth. Regrowth will usually occur in the proximity of the pruning cut because buds are no longer under the degree of apical control that prevailed prior to pruning. In addition, there are fewer buds being supplied by the same sized root system so that growth regulators, nutrients and reserves are concentrated in the remaining buds. These buds are stimulated to develop by high concentration of growth regulators which results in a localized invigoration of vegetative growth.

The growth response to pruning will persist so long as the root:shoot ratio is out of equilibrium.

With increased pruning severity the number of remaining growing points is reduced so that fewer but longer shoots develop, giving an impression that growth has been increased (Table 1). However, the net effect from

pruning is that total growth is reduced. This is caused by a reduction in total leaf area of the tree causing a reduced supply of carbohydrates and lower growth regulator concentrations from fewer apical buds. Growth increment is most severely reduced in the branches, trunk and root system and is simply measured as a reduced increase in girth. Increasing severity of pruning causes a redistribution of growth to favor new shoot growth, while reducing the rate of trunk and root growth increment. In very severe pruning total shoot growth can also be reduced (Table 1).

Just as pruning reduces total growth, fruiting is also reduced. Increasingly severe pruning shifts dry matter increment in the tree toward vegetative growth and away from fruiting. Much of this effect seems due to the removal of crop by pruning out increasing numbers of buds (Table 2). As a consequence, there are fewer sites for flowering, fruiting, or initiation of new floral buds. Furthermore, the shift toward greater vegetative growth is caused in part by redirection of spurs into shoot development. It is thought that this is due to changes in hormone balances in response to pruning rather than an effect on carbohydrate status. There have been many studies which have shown that heading cuts reduce long-term yield more severely than thinning out cuts.

### BASIC RESPONSES TO TRAINING

Whereas pruning primarily acts to interrupt apical dominance and control, branch training influences growth and fruiting via gravimorphic effects influencing apical control and branching patterns. Training of branches to flatter positions decreases growth and increases flowering. However, the two responses may not be directly correlated as, in some studies, horizontally placed branches have not shown increased flowering or cropping despite reduced shoot growth. Considerable modification to growth is possible by varying the magnitude of deflection away from the vertical position. While growth reductions are readily observed, it is less clear whether branching patterns are altered with training. One study shows that patterns of branching of vertical and horizontal limbs were similar, but lateral growth was reduced in the horizontal limbs (Table 3) (Myers and Ferree, 1986). Lateral branching per se was not affected by orientation. Where branch orientation falls below the horizontal, the loss of apical dominance will induce an uncharacteristic pattern of branching typified by the growth of strong vertical shoots arising from the arc of the limb.

In general terms then, pruning and training have ►



opposite effects on growth and fruiting – pruning acting to increase growth and reduce fruiting, training by branch bending acting to reduce growth and increase flowering and fruiting. □

## REFERENCES

Barden, J. A., DelValle, T. B. G. and Myers, S. C. 1989. Growth and fruiting of 'Delicious' apple trees as affected

by severity and season of pruning. *J. Amer. Soc. Hort. Sci.* 114:184-186.

Maggs, D. H. 1963. The reduction in growth of apple trees brought about by fruiting. *J. Hort. Sci.* 38:119-128.

Mika, A. 1986. Physiological responses of fruit trees to pruning. *Horticultural Reviews* 8:337-378.

Myers, S. C. and Ferree, D. C. 1986. Influence of summer pruning on the growth pattern of vigorous 'Delicious' apple limbs. *HortScience* 21:252-253.

**TABLE 1**

Effect of pruning severity on shoot growth on limb sections of 'Delicious' apple (from Barden et al., 1989).

| Pruning severity <sup>1</sup> | Shoot number <sup>2</sup> | Mean Shoot Length (cm) <sup>2</sup> | Total Shoot Growth (cm) <sup>2</sup> |
|-------------------------------|---------------------------|-------------------------------------|--------------------------------------|
| 0                             | 20.4a                     | 19.6b                               | 402a                                 |
| 1                             | 16.0b                     | 23.6b                               | 361a                                 |
| 2                             | 14.9b                     | 24.8b                               | 362a                                 |
| 3                             | 8.4c                      | 29.6a                               | 244b                                 |

**TABLE 2**

Effect of pruning severity on flowering and fruiting on limb sections of 'Delicious' apple (from Barden et al., 1989).

| Pruning Severity <sup>1</sup> | Number Spurs Flowering <sup>2</sup> | Total Number Flower Clusters <sup>2</sup> | Total Number Fruit <sup>2</sup> |
|-------------------------------|-------------------------------------|---|---------------------------------|
| 0                             | 30.4a                               | 54.2a                                     | 21.4a                           |
| 1                             | 23.1b                               | 38.6b                                     | 14.1b                           |
| 2                             | 14.9b                               | 33.4a                                     | 11.2b                           |
| 3                             | 3.7d                                | 14.4c                                     | 3.1c                            |

<sup>1</sup> 0 = unpruned, 1 = cut to midpoint of past season terminal growth, 2 = cut 5mm below origin of past season's terminal growth, 3 = cut to midpoint of 2-year-old section of terminal growth. Data are means for summer and dormant pruning and five rootstocks.

<sup>2</sup> Within-column means followed by the same letter are not significantly different, Tukey's 0.5 level.

**TABLE 3**

Effect of limb orientation on distribution of lateral shoot growth on two-year-old limb sections of 'Delicious' apple (from Myers and Ferree, 1986).

| Limb Orientation | Lateral Shoot Length/Section |             |             |
|------------------|------------------------------|-------------|-------------|
|                  | Proximal (cm)                | Middle (cm) | Distal (cm) |
| Vertical         | 3a                           | 23a         | 291a        |
| Horizontal       | 3a                           | 22a         | 187b        |

Note: Within-column means followed by the same letter are not significantly different, Tukey's 0.5 level.



# Analyzing Washington's Tree Fruit Statistics

Paul J. Tvergyak

Washington State University Cooperative Extension Agent, Wenatchee, WA

Most orchardists have at least heard about some of the tree number and acreage data generated by the 1993 Washington Fruit Survey. Analyzing the numbers tells the real story of what's happening and what you might consider in making orchard decisions.

The survey is divided into three basic areas that are of interest – acreage, tree number and trees per acre. Figure 1 shows yearly planting of apples in Washington in each category.

If we look at acres in 1986 and 1993 in Washington there are some interesting numbers (Table 1). In 1986 75% of the acres were Delicious. In 1993 Delicious dropped to 64% of the total 172,000 acres. Golden Delicious and Granny Smith remained stable at 14% and 5% respectively. Gala (3%), Fuji (6%) and Braeburn (2%) account for much of the increased acreage and loss in Delicious.

An even more interesting set of numbers is nonbearing and older tree acres (Table 2). Since 1986 bearing acreage of all apples has not changed. It is 85% for 1986 and 1993. This could be a little disturbing if you agree that we need about 20% of the acreage nonbearing on a 20-year rotation to keep the industry current. Even with the

seemingly large amount of planting going on we have still not improved Washington's overall position. Nonbearing acres of Braeburn (86%) and Fuji (77%) are quite high and we would expect dramatic increases in fruit volume (Figure 2). Gala volume, at 45% nonbearing, will also be higher but at a less dramatic rate. Older trees also play a role in planning and the older plantings are not being replaced at a slower pace in 1993 than in 1986. In 1986 17% of the Delicious were over 20 years old. In 1993 33% were older than 20 years. The same pattern is true for other varieties but it is not as dramatic, in part because of the newer plantings of Braeburn, Fuji and Gala.

Number of trees planted (Figure 1, top) clearly explains why we see increasing volumes of fruit. Combined with the increasing number of acres there is an estimated 17.5% increase in bearing surface in 1993 over 1986.

No one is surprised to see an increase in trees per acre being planted (Figure 1, bottom). There almost seems to be a trees-per-acre contest to see who can win the 1,000 boxes per acre in the third leaf prize. Although we see the most dramatic change in tree density in Fuji, Braeburn and Gala, tree density is also increasing gradually with ►

**TABLE 1**  
Washington Apple Acreage By Variety in 1986 and 1993.

| Variety          | 1986           |    | 1993           |    |
|------------------|----------------|----|----------------|----|
|                  | Acres          | %  | Acres          | %  |
| Red Delicious    | 121,175        | 75 | 110,000        | 64 |
| Golden Delicious | 22,665         | 14 | 23,300         | 14 |
| Granny Smith     | 8,240          | 5  | 8,500          | 5  |
| Braeburn         | —              | —  | 3,300          | 2  |
| Fuji             | —              | —  | 11,100         | 6  |
| Gala             | —              | —  | 5,900          | 3  |
| Other            | 8,920          | 6  | 9,900          | 6  |
| <b>Total</b>     | <b>161,000</b> |    | <b>172,000</b> |    |

**TABLE 2**  
Washington Apple Acres

| Year | Total Acres | % Bearing | % More Than 20 Years |       |
|------|-------------|-----------|----------------------|-------|
|      |             |           | Red Delicious        | Other |
| 1986 | 161,000     | 85        | 17                   | 23    |
| 1993 | 172,000     | 85        | 33                   | 26    |



Delicious and Golden Delicious. The reasons for the slower changeover in Delicious probably relates to the relatively poor performance of spur-type Delicious on the more dwarfing rootstocks needed in the highest density blocks. On the other hand, growers are taking advantage of the more vigorous Fuji and Gala varieties and their better match with dwarfing stocks. Braeburn, whose growth habit and

vigor are more like spur Delicious, may see more semi-dwarf rootstock utilization and a corresponding reduction in trees per acre in the near future as performance slows. □

#### REFERENCE

Washington Fruit Survey 1993. Washington Agricultural Statistics Service, P.O. Box 609, Olympia, WA 98507.

Figure 1 — 1993 Washington Apple Survey

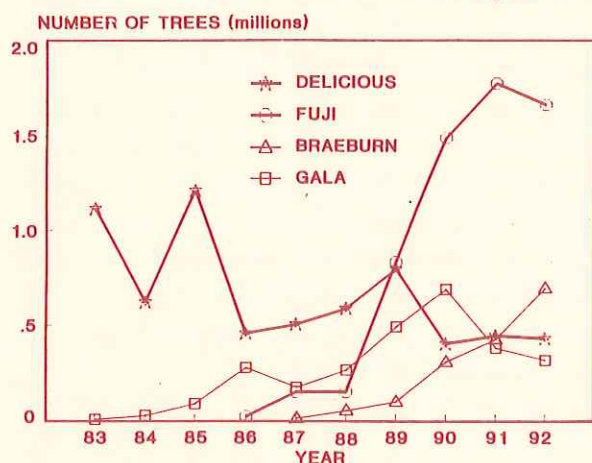


Figure 1 (A)

Figure 1 (B)

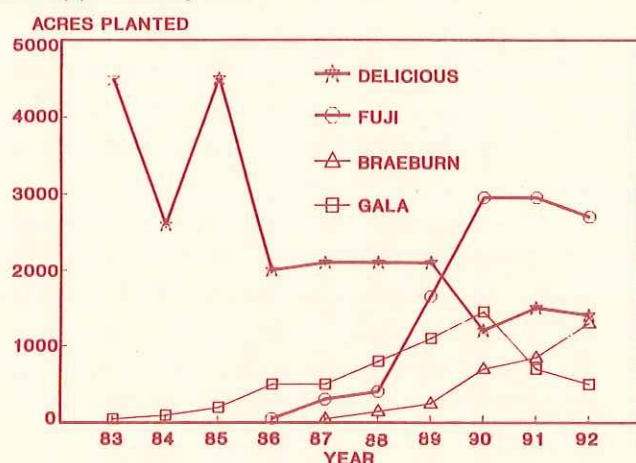


Figure 1 (C)

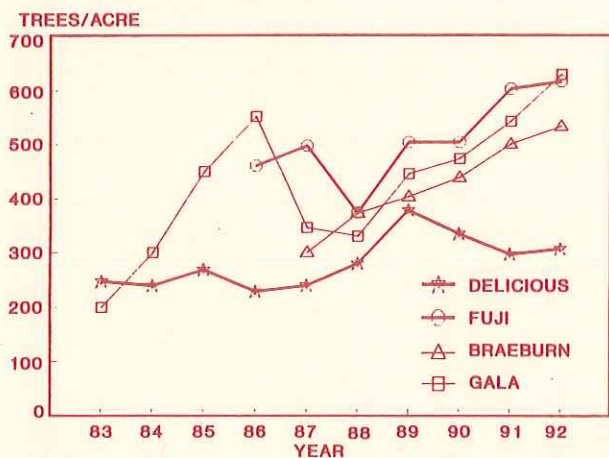
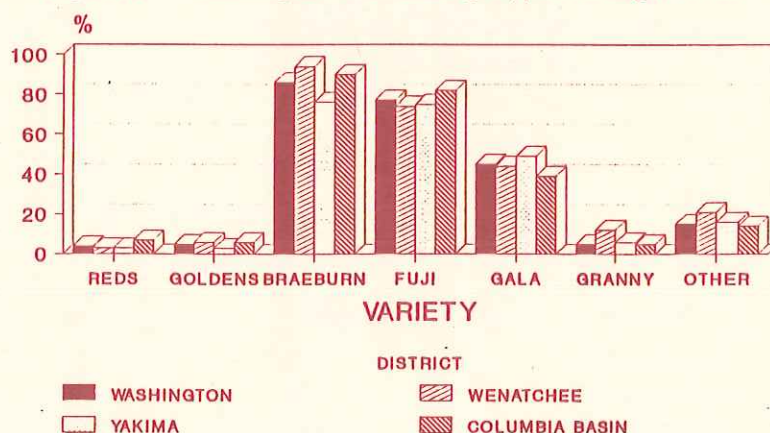


Figure 2 — Washington Nonbearing Apple Acreage, 1993



## IDFTA Calendar

June 19-21, 1994 . . . . . IDFTA Summer Tour, Sacramento, California

February 26-28, March 1, 1995 . . . . . IDFTA Conference, Hershey, Pennsylvania

Summer 1995 (June-July)

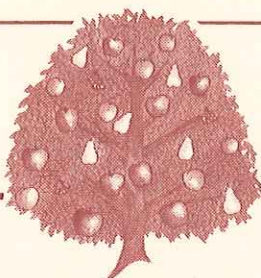
1 to 2 weeks, dates to be announced

IDFTA European Study Tour led by Dr. Bruce Barritt, IDFTA Education

Director, to southern Germany (Bodensee district), northern Italy (South Tyrol district) and The Netherlands

February 25-29, 1996 . . . . . IDFTA Conference, Kelowna, British Columbia



**EDUCATIONAL DIRECTOR**

Bruce H. Barritt  
1100 N. Western Avenue  
Wenatchee, WA 98801

(509) 663-8181 (office)  
Ext. 233  
(509) 664-0526 (FAX)

**BUSINESS DIRECTOR**

Charles J. Ax, Jr.  
14 South Main Street  
Middleburg, PA 17842

(office) (717) 837-1551  
(home) (717) 539-8300  
(FAX) (717) 837-0090

# COMPACT NEWS

A Periodic Newsletter of the International Dwarf Fruit Tree Association

No. 4

November 1994

## IDFTA CONFERENCE

Hershey, Pennsylvania  
February 26-28, March 1, 1995

The IDFTA conference will begin Sunday evening, February 26, at the Hershey Lodge and Convention Center in Hershey, Pennsylvania. The Monday and Wednesday programs will include educational sessions and on Tuesday there will be orchard tours.

Registration material and a full program for the Hershey conference will be mailed to IDFTA members in late December.

### THE PROGRAM WILL FEATURE FOUR INTERNATIONAL SPEAKERS.

**Dr. Alojzy Czynczyk**, an authority on apple rootstocks, is head of the Department of Breeding, Cultivar Trials, Orchard and Nursery Management and Small Fruit Culture at the Research Institute of Pomology and Floriculture in Skierniewice, Poland. He was a featured speaker at the 1984 IDFTA conference in Grand Rapids, Michigan. At that meeting he spoke about hardy dwarfing rootstocks (P2, P22, etc.) from Poland and the performance of dwarfing rootstocks and interstems. At the Hershey conference, Dr. Czynczyk will speak about the newest group of winter hardy and dwarfing rootstocks from the Polish breeding program as well as the Polish apple industry as it moves into a free market economy.

**Peter Triloff** is a pest management adviser with a large fruit grower cooperative (Marktgemeinschaft Bodenseeobst EG) in Friedrichshafen in the Bodensee fruit district of southern Germany. He recently presented a paper on pesticide application methods at the South American symposium on temperate fruit production in Brazil. At Hershey he will speak about fruit growing in the

Bodensee area and about Integrated Fruit Production (IFP) techniques designed to reduce pesticide residues on fruit and minimize the negative impact on the environment of chemicals used in fruit growing.

**Dr. Walter Waldner** is head of the South Tyrolean Tree Fruit and Grape Advisory Service (Südtiroler Beratungsring für Obst- Und Weinbau) located in Lana, Italy. He will speak about the establishment and management of new high density orchards, including discussions of tree quality, orchard systems, tree support systems and pruning and training techniques. In a second presentation, he will describe orchard management techniques used to meet the European Integrated Fruit Production requirements for minimizing the environmental impact of agricultural chemicals. European consumers are demanding that fruit be produced with as few pesticides (insecticides, fungicides and herbicides) as possible and the comprehensive IFP strategies are designed to meet that goal.

**Mike Sanders** will present the Robert F. Carlson Distinguished Lecture at the 38th Annual IDFTA Conference. He is the Tree Fruit Specialist with the British Columbia Ministry of Agriculture, Fisheries and Food (BCMAFF) and is located in Kelowna, British Columbia. He has over 25 years of experience as a horticulturist with the BC tree fruit industry and has been instrumental in the rapid transition of BC orchards to high density and super high density orchard systems. He is editor of the BC tree fruit industry publication "Tree Fruit Leader." In his presentation he will discuss matching the orchardist's production system (rootstock, tree density, support system, etc.) with the local climate, soils, land use regulations, market opportunities and economic factors. □



# APPLE ROOTSTOCK DESCRIPTIONS—PART I

## EIGHT ROOTSTOCKS

### MORE DWARFING THAN MALLING 9

Bruce H. Barritt

Washington State University, Tree Fruit Research and Extension Center  
Wenatchee, WA 98801

Worldwide, there are many new and potentially valuable apple rootstock varieties for medium, high and super high density orchards. Some have not been evaluated in the U.S. while others are currently being studied. In this three-part article 26 of the newer rootstocks are compared with Malling (M.) 9, M.26 and M.7, three commercially successful rootstocks that have been extensively evaluated. Part I will feature rootstocks more dwarfing than M.9; Part II, rootstocks in the M.9 size range, including clones of M.9; and Part III, rootstocks in the M.26 to M.7 size range.

In North America tree fruit rootstock research is coordinated under project NC-140. Performance of 23 rootstocks in NC-140 trials established in 1980 and 1984 at approximately 30 sites has been published by NC-140. Results of these trials and other North American and European trials are incorporated into the rootstock descriptions presented here.

'EMLA' refers to virus-tested clones developed at the East Malling and Long Ashton Research Stations; 'E' will be used as the abbreviation for EMLA throughout this article. Fruit production estimates are presented as 'yield efficiency.' Yield efficiency refers to productivity per tree adjusted to a common tree size (yield/tree ÷ tree trunk cross-sectional area). For example, if two trees have similar yield/tree but one tree is half the size of the other, the smaller tree has twice the yield efficiency. Similarly, if two rootstocks produce trees of the same size and one has twice the yield of the other, the more productive tree has twice the yield efficiency.

The ranking of rootstocks for tree vigor varies somewhat with the scion variety, the virus status of the rootstock and scion, and environmental factors that may be limiting at each site. In spite of variation associated with these factors, there is generally worldwide agreement on the vigor range for each rootstock. Rootstocks are listed in estimated order of increasing tree size, although differences between closely ranked rootstocks may be small. Rootstock descriptions

are presented for 8 rootstocks which produce trees smaller than M.9E.

#### M.27E

Malling 27 is an extremely dwarfing rootstock released in 1971 (formerly Malling 3431) from the East Malling Research Station breeding program in England. Its parents are M.9 and M.13. M.27E produces a tree between one-third and one-half the size of a tree on M.9E. M.27E is precocious. Its yield efficiency is high although it may be less than M.9E. Fruit size is generally smaller than with M.9E. M.27E trees require support. It does not produce root suckers and is free from burrknots. M.27E is easily propagated in the stoolbed. Tests for collar rot resistance have given variable results. It is susceptible to fire blight but less susceptible than M.9 and M.26. M.27E is susceptible to woolly apple aphid. Winter hardiness is less than M.9. Until recently it has been considered too dwarfing for commercial plantings. However, in Europe it is now being used in some very high density slender spindle and super spindle orchards on strong soils with vigorous, large-fruited varieties such as Jonagold.

#### P.16

The Polish rootstock P.16 is a very dwarfing rootstock producing trees slightly larger than M.27E. It originated from a cross of M.9 X Common Antonovka. P.16 is precocious and has very high yield efficiency. Fruit size is similar to M.9E. It is resistant to collar rot but susceptible to fire blight and woolly apple aphid. P.16, like M.9, is fairly difficult to propagate in the stoolbed. Winter hardiness is similar to M.9 but less than P.22, B.9 and M.26. P.16 trees have very brittle roots and require support. It does not have burrknots and in North American trials has a few root suckers.

#### P.22

The Polish rootstock P.22 is a very dwarfing rootstock which originated from a cross of M.9 X Common Antonovka. It produces a tree between M.27E and M.9E in



size, although usually closer to M.27E. P.22 is precocious and has high yield efficiency, similar to M.9E. Fruit size is similar to M.9E. P.22 requires support. It is very winter hardy, comparable to M.26, O.3, B.9 and P.2, and is consistently hardier than M.9 and M.7. It is fairly difficult to propagate in stoolbeds and in this tendency is similar to M.9. P.22 has shown some tree loss in the early years, possibly due to its relatively limited root system at planting. It does not have burrknots or root suckers. It is resistant to collar rot but is susceptible to fire blight and woolly apple aphid.

### V.3

Vineland 3 is a new dwarfing rootstock from the Vineland, Ontario, breeding program. It is an open pollinated seedling of the crabapple variety Kerr (Dolgo X Haralson). The pollen parent is believed to be M.9. V.3 produces a tree between M.27E and M.9E in size, although usually closer to M.27E. It is precocious and has high yield efficiency, comparable to M.9E. Fruit size is similar to M.9E. It requires support. V.3 produces few root suckers. It propagates well in the stoolbed. Its winter hardiness and disease and insect resistance are not known. Experience is limited to North American evaluations in Ohio and Washington.

### B.146

Budagovsky 54-146 is a very dwarfing rootstock bred in Russia. B.146 produces trees between M.27E and M.9E in size, although usually closer to M.27E. It is precocious and has yield efficiency similar to M.9E. Fruit size is similar to or slightly smaller than M.9E. It is very brittle and requires support. It is prone to produce burrknots and root suckers. It propagates very well in stoolbeds. B.146 is very winter hardy. It is susceptible to fire blight and woolly apple aphid. Its susceptibility to collar rot is not known. It has not been widely tested in North America.

### B.491

Budagovsky 57-491 is a very dwarfing rootstock bred in Russia. It produces a tree between M.27E and M.9E in size. It is very winter hardy. B.491 propagates easily in the stoolbed. Numerous burrknots are produced. It is susceptible to fire blight and woolly apple aphid. It requires support. It has not been widely tested in North America.

### G.65

Geneva 65 is a very dwarfing rootstock released in 1991 from the Cornell University breeding program at Geneva, New York. It originated from a cross of M.27 X Beauty Crab.

G.65 produces a tree smaller than M.9 that is precocious and productive. Roots are not brittle. It requires support. It is very resistant to fire blight and collar rot and is moderately susceptible to woolly apple aphid. It is sensitive to stem-grooving virus and therefore only virus-free scion wood should be used. It has few burrknots and a moderate number of suckers. G.65 is a new rootstock planted in 1992, 1993, and 1994 NC-140 trials throughout North America.

### Mark

Michigan Apple Clone 9 (MAC.9) is a dwarfing rootstock released as Mark by Michigan State University in 1979. It is an open-pollinated seedling of M.9. Tree size with Mark has been somewhat variable. When evaluated for 10 years at 27 sites in North America, Delicious trees on MAC.9 averaged 68 percent of the tree size (trunk cross-sectional area) of trees on M.9E. In an irrigated site in Washington with three scion varieties tree size at year 8 averaged 56 percent and 60 percent of M.9E for Mark and MAC.9, respectively. On heavier soils or sites where drought stress does not occur, trees with Mark have been closer to M.9E in tree size. Mark has shown greater tolerance to flooding than M.9 or M.26 and less tolerance to drought than M.9. Its tendency to crop heavily on young trees may contribute to stunting if trees are not adequately thinned.

Mark is very precocious and has high yield efficiency, similar to M.9E. Scions with Mark have smaller fruit size than with M.9E (fruit size adjusted for crop load). Trees on Mark require support. It propagates well in the stoolbed. Mark is resistant to collar rot but susceptible to fire blight and woolly apple aphid. Burrknots are common, a situation similar to M.26. For this reason, very little rootstock should appear above the soil line in the orchard.

A conspicuous gall-like swelling, termed soil-line swelling or root mass proliferation, often surrounds the Mark rootstock at and below the soil line. Trees with soil-line swelling may have light green leaves and reduced tree vigor. Root suckers can be numerous, originating just below the soil line at the periphery of the swelling. The cause of soil-line swelling is unknown. Soil-line swelling of the rootstock should not be confused with swelling of the scion that occurs at the scion/rootstock union with many dwarfing rootstocks, including Mark.

This article will be continued (Part II) in an upcoming issue of *Compact News*. The following rootstocks with tree vigor similar to M.9E will be described in Part II: P.2, CG.10, M.9E, V.1, CG.16, J.9, B.9, O.3, Bemali and MAC.39. □



# INTEGRATED FRUIT PRODUCTION IN SOUTH TYROL

Hermann Oberhofer, AGRIOS  
Lana, Italy

In the fruit-growing region of South Tyrol (Province of Bozen/Bolzano) the integrated fruit production program is run by AGRIOS, the working group for integrated fruit production. AGRIOS was founded in 1988 and the first guidelines were published in 1989. All the important organizations involved in our fruit industry are members of the working group: Agricultural Authorities, Experiment Station, Extension Service, Farmers Union, the fruit cooperatives and private merchants.

## GOALS

Integrated production methods are to produce:

- regular yields of good **quality** fruit
- in a **profitable** way
- with the lowest possible input of chemicals
- in order to protect the **environment and human health**.

## GUIDELINES

The "Guidelines for Integrated Fruit Production," the "Guidelines for Handling and Storage" and the "Regulations for the Application of the Label" are published by the AGRIOS in two brochures (in German and Italian). The guidelines give the general principles, minimum standards and recommendations for integrated production. That includes the choice of the site, the planting material, the fruit variety, planting system, soil cultivation, fertilization, irrigation, tree training and fruit management. The central part of the guidelines for integrated production is the integrated pest management program. Priority is given to natural and biotechnical methods of pest, disease and weed control. The use of agrochemicals must be minimized. Pesticides may only be used when justified and then the most selective, least toxic and least persistent products must be selected. The nationally available products have to be allocated to lists of permitted products ("green list") and products permitted with restrictions ("yellow list"). All other pesticides are not permitted (in a "red list").

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## ALLOCATION OF PESTICIDES ACCORDING TO THEIR TOXICITY AND ENVIRONMENTAL IMPACT IN THE IFP-PROGRAM IN SOUTH TYROL (ONLY A PARTIAL LIST):

### "Green list":

Insecticides: *Bacillus thuringiensis*, pheromones for mating disruption, Amitraz, chitin synthesis inhibitors, Ethionphencarb, Pirimicarb, mineral oil.  
Fungicides: IBE-fungicides, Captan, Dithianon, Dodine, Nimrod.  
Acaricides: none.  
Herbicides: Glyphosate, Gluphosinate, Fusilade.

### "Yellow list":

Insecticides: Acephate, Formothion, Phosphamidon, Chlorpyrifos-Methyl.  
Fungicides: Dithiocarbamates, sulfur.  
Acaricides: Benzoximate, Hexithiazox, Chlorphentezin, Fenbutatinoxid.  
Herbicides: Simazin, MCPA.

### "Red list":

Insecticides: Pyrethroids, Ultracid, Dimethoat, Omethoat, DNOC, Parathion, Vamidothion, Thiodan, Methomyl a.o.  
Fungicides: Benzimidazole, Chlortalonil a.o.  
Acaricides: Dicofof, Azocyclotin, Cyhexatin a.o.  
Herbicides: Diquat, Paraquat, Dicamba, Caragard a.o.

In this program all chemical postharvest treatments of the fruit (with fungicides and antioxidants) are forbidden.

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## PARTICIPATION

An average of 80% of our fruit growers enroll every year in the spring for integrated fruit production. This includes about 6,000 farms with 30,000 acres. During the production phase there are cancellations by the growers who have some special problems (e.g., plant protection) and also exclusions by the control service. At harvest about 65% of the production is still integrated. Due to the



chemical postharvest antiscald treatments about 20% of the production also has to be excluded. An average of about 45-50% of our fruit may be marketed every year with the integrated label: the provincial trademark with the lady bird beetle.



### CERTIFICATION

Certification of the performance of the integrated program at the farms and packing houses is done by the Plant Protection Office in Bozen. In 1994 about 490 **certification visits** (+ certification of farm records) took place. At the same time, 365 samples of leaves were taken in order to analyze them for restricted chemicals. At the end of the production phase and before harvest all the field books (about 5,000) were checked. During the delivery of the fruit to the packing house the correct marking of the bins as "integrated" or "not-integrated" was supervised. After harvest the **packing house certification starts**. Here the correct labeling of the packed fruit has to be checked. Only fruit lots treated according to both guidelines for production and storage may be marked with the label of inte-

grated fruit production. Misuse of the integrated label resulted in fines in several cases in the production and marketing phase.

### COSTS

The working group AGRIOS and its activity (with a budget of about \$100,000 US annually without analysis) are **financed** at 70% by the packing houses (cooperatives) and 30% by the provincial government. The certification activity of the Plant Protection Office is entirely borne by the government.

### RESULTS

The introduction of the integrated label (in 1990) and extensive publicity improved considerably the image of our fruit on the market. Demand has been increased. Last year about 30% of our fruit was marketed with the integrated label. The market in general is interested in the label and wishes in many cases to have it on the boxes. However, only a few cooperatives pay higher prices to their members for integrated fruit. That is a point which many growers do not understand. Some people raise the question: Why should I undergo a quite severe control system if there is no reward? That is a question which we will address in the near future. □

## "A" IS FOR APPLE

Match the word with the meaning (answers on page 7)

- |                               |   |
|-------------------------------|---|
| 1. apple                      | ___ A. nonsense; disguised flattery                           |
| 2. applehawk                  | ___ B. tomatoes   |
| 3. appleknocker               | ___ C. pomegranates   |
| 4. apple of discord           | ___ D. Scottish group who introduced golf into the US in 1888 |
| 5. apple of one's eye         | ___ E. prim and precise orderliness                           |
| 6. apple-pie order            | ___ F. an obsequious flatterer                                |
| 7. apple-polisher             | ___ G. that which one holds dearest                           |
| 8. applesauce                 | ___ H. anything disappointing                                 |
| 9. apples of paradise         | ___ I. potatoes   |
| 10. apples of perpetual youth | ___ J. forbidden fruit  |
| 11. apples of sodom           | ___ K. drink distilled from fermented apple juice             |
| 12. apples of Carthage        | ___ L. to ruin carefully laid plans                           |
| 13. love apples               | ___ M. baseball   |
| 14. finger apples             | ___ N. dates  |
| 15. apples of the earth       | ___ O. a good fielder in baseball                             |
| 16. Apple Tree Gang           | ___ P. something to be disputed; the cause of a dispute       |
| 17. upset the apple-cart      | ___ Q. golden apples in mythology                             |
| 18. Apple-jack                | ___ R. a city term for a rustic stupid person                 |



## IDFTA EUROPEAN STUDY TOUR JUNE 24 – JULY 8, 1995

The IDFTA 1995 Summer Tour will feature orchard and research station visits in three European fruit districts: in week one, The Netherlands and Belgium and in week two the Bodensee area of Germany/Switzerland and, just across the Alps, the South Tyrol district in northern Italy. In Holland and Belgium, the emphasis will be on high density apple orchard systems, including slender spindle and super spindle at densities of 1,000 to 5,000 trees/acre. In addition, dwarfing rootstocks, including M.9 clones and M.27, matching nursery tree quality to specific orchard systems and sprayer technology, including recirculating tunnel sprayers will be studied. In the Bodensee district of southern Germany, visits will include unique spray equipment for high density orchards, super spindle tree training, orchards cropping heavily in years one and two, and integrated fruit production practices (fruit production with minimal environmental impact). On the Swiss side of the Bodensee, the Güttinger V, Drilling, and Mikado orchard systems will be seen. The tour will finish in the high mountain valleys of South Tyrol, Italy. South Tyrol is known for the production of very high quality fruit, for its sunny, warm climate and for its beautiful setting in the Alps. Here high density systems, dwarfing rootstocks, management of young trees and integrated fruit production techniques will be studied.

The cost of the two-week study tour has not been set; however, it is expected that the total costs of land tour and air fare will be between \$3,000 and \$3,400, depending on the US/Canadian departure city and currency fluctuations during the next several months. The actual cost will be announced in January and will include transportation, lodging and all breakfasts.

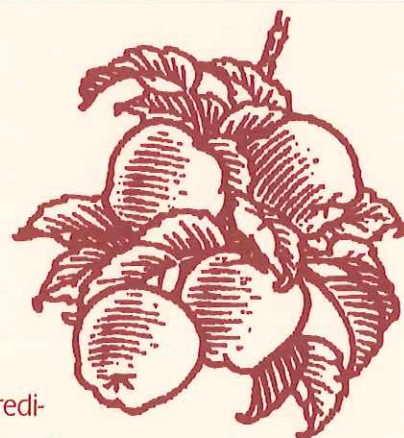
The basic format for the study tour includes local travel and orchard and research station visits from 8 to 5 daily. The middle weekend will include long-distance travel and, when possible, some rest time. Spouses are encouraged to participate, although there is not a separate itinerary for spouses. Two nights will be spent at most locations. This allows spouses to visit the local area for a day of sightseeing if they do not wish to participate in the orchard visits.

A comprehensive itinerary will be available in January. For more information about the technical visits, please contact IDFTA Education Director and tour leader, Dr. Bruce Barritt (phone: 509-663-8181, ext. 233; FAX 509-662-8714), and for information about travel arrangements, please call the tour coordinator, Bob Curtis of Curtis-C Travel at P.O. Box 7188, East Wenatchee, WA 98802 (phone: 1-800-562-2580; FAX: 509-884-5651). □

### Fried Apples and Onions

- |   |                                   |
|---|-----------------------------------|
| 2 large onions, sliced                      | 1/2 cup firmly packed brown sugar |
| 2 tablespoons butter or margarine, melted   | 1 teaspoon salt                   |
| 6 large cooking apples, unpeeled and sliced | 1/2 teaspoon paprika              |
|   | 1/8 teaspoon ground nutmeg        |

Saute onion in butter in a large saucepan over medium heat until tender. Place apple slices on top of onion. Combine brown sugar and remaining ingredients; sprinkle over apple slices. Cover and simmer 12 to 14 minutes. Uncover and simmer an additional 5 minutes or until apple slices are tender. Serve with a slotted spoon.  
Yield: 10 to 12 servings.





Reprinting of Historical Fruit Book

# THE FRUIT GROWER'S HAND BOOK

by William G. Waring

First Published in 1851; Reprinted in 1994

This historical book is subtitled "A Concise Manual of Directions for the Selection and Culture of the Best Hardy Fruits in the Garden or Orchard." It includes a descriptive list of the most approved and popular varieties of hardy fruits in 1851 which could be grown for enjoyment throughout the season: apples, apricots, berries, cherries, cranberries, currants, gooseberries, grapes, mulberries, nectarines, peaches, pears, plums, quinces, raspberries, strawberries; and various nuts and rhubarb. Each fruit is introduced by a general description of its group, including drawings of fruit forms and their uses and culture.

Some apples still known today are: Baldwin, Benoni, Gravenstein, Jonathan, Newtown Pippin, Rambo, Rhode Island Greening, Smokehouse, Northern Spy, Wagener, and Winesap.

The second part of the book is devoted to "How, When, And Where To Plant" and includes "general rules for the successful and economical culture of fruit trees and plants, with reasons and directions for their intelligent application, under varying conditions and circumstances." He considers the root, stem and branches, leaves, flowers, fruit, soil, manures, situation (site), selection of trees, orchard arrangement, transplanting, pruning and training, propagation, and a calendar of operations. A glossary contains horticultural terms used in the book.

Of interest is a reference to dwarf trees: "Most kinds of fruit trees can be made dwarfish and fruitful, either by working on slow growing stocks, or by rigorous root-prun-

ing and summer pinching. Large heavy fruits, liable to be blown from standards, can be grown successfully as dwarfs."



Cover art from  
*The Fruit Grower's Hand Book*  
Facsimile reproduction by the  
Centre County Historical Society

On the last page, Waring advertises his Centre Nurseries in Tyrone (Blair County) and in Boalsburg (Centre County), Pennsylvania. He served as the first principal of the Farmers' High School, which later became the Pennsylvania State University.

This little 4 by 6 inch book of 135 pages was printed in 1851 by Lutz & Scheffer, Harrisburg, Pennsylvania. It will be of great interest to all those who enjoy growing and eating fruits. Its facsimile reproduction in 1994 will make this classic generally available again.

*The Fruit Grower's Hand Book* is available from the Centre County Historical Society for \$15.25, postage included. Send check or money order to C.C.H.S. Publications, Centre Furnace Mansion, 1001 E. College Ave., State College, PA 16801. □

Reviewed by Dr. Loren D. Tukey, Professor Emeritus of Pomology, Pennsylvania State University.

## ANSWERS TO "A" IS FOR APPLE

|   |    |   |    |   |    |
|---|----|---|----|---|----|
| A | 8  | G | 5  | M | 1  |
| B | 13 | H | 11 | N | 14 |
| C | 12 | I | 15 | O | 2  |
| D | 16 | J | 9  | P | 4  |
| E | 6  | K | 18 | Q | 10 |
| F | 7  | L | 17 | R | 3  |



## IDFTA CALENDAR

February 26-28, March 1, 1995 IDFTA Conference, Hershey, Pennsylvania  
 June 24-July 8, 1995 IDFTA European Study Tour  
 February 25-29, 1996 IDFTA Conference, Kelowna, British Columbia

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 Integrated Fruit Production  
 European Study Tour  
 Book review by Dr. Loren D. Tukey

*I have enough money  
 to last me the rest of my life,  
 unless I buy something.*

*- Jackie Mason*

8 November 1994

COMPACT NEWS

No. 4

## International Dwarf Fruit Tree Association

COMPACT NEWS

14 South Main Street  
 Middleburg, PA 17842



Member 275  
 WALLACE E. HEUSER  
 SUMMIT SALES  
 55826 60TH AVE  
 LAWRENCE, MI 49064  
 USA



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