REPLANT SEMINAR PROCEEDINGS

JANUARY, 2002

Ministry of Agriculture, Food & Fisheries

Okanagan Valley Tree Fruit Authority

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OVTFA REPLANT SEMINARS Agenda		
8:30 am	Overview of Replant Program	Jim Campbell
8:45 am	Hot Varieties	
	• Ambrosia	Jim Campbell
	• New Strains of Gala, Fuji, Braeburn	Ken Haddrell
	• New Cherry Varieties, Skeena, Staccato, Early Varieties	Ken Haddrell
	• Peaches, Nectarines and Apricots	Tim Watson
9:40 am	• Economics of Replanting - an Overview	George Geldart
10:05 am	• Break	
10:20 am	• First Year Tree Management	Peter Waterman
11:15 am	• Weed Control	Gene Hogue
11:45 am	• Ideas on the Future of the Industry	Rob Dawson
12:00 pm	Summary/Discussion/ Questions	

OVTFA Replant Programs
By: Jim Campbell

Okanagan Valley Tree Fruit Authority (OVTFA)

- The OVTFA Replant Program will continue at the current level of payment and will cover replant projects through to the spring of 2005
- The OVTFA Replant Advance Program will continue for replant projects completed in 2004
- The OVTFA Grafting Program will continue at the current level of payment through to spring of 2004
- The Transitional Production Adjustment Program (TPAP) will continue and it is planned that payments will be made at the current level including plantings in 2005
- Funding will be limited and there may not be enough funding to cover all projects during the next four years. The OVTFA will be announcing how they intend to manage the demand for replanting later this spring.

Replant

- Apples $5 per tree to a maximum of $7000
- Soft fruits $5 per tree + $750 per acre - maximum of 812 t/a
- Minimum one acre projects
- Expansion of blocks acceptable
- Program in place until 2005?
- Application deadline Dec 15

TPAP

- 2,250 paid on replant acreage the year following replant grant
- New land is not eligible
- Change in owner - not eligible

Test Varieties Program

- Non commercial varieties eligible
- Minimum of 250 trees to a maximum of 1 A
- May replant or graft over within 5 years
- Need testing agreement
- Expect application would be part of a commercial replant application

New Varieties

Successful Introduction of a New Variety*

- Marketing programs
  - Consumers, buyers and retailers
- Price Point
- Cosmetic Appearance
  - uniqueness
  - appearance

* Source - An Assessment of Promising New Varieties, Benchmark Research Services

What to Plant Dilemma

- No variety is perfect
- Obtain as much information about the commodity and variety as you can
- Risk taking is part of the game
- Get involved in packing and marketing
- Improve your horticultural skills
- Maximize your tree density
- Grow high quality fruit

Factors for Variety Selection

- Site
- Location
- Managerial ability
- Horticultural Skills
- Market niches
- Labour management
- Grower preference
- World supply factors
- Marketing skills
- Changes in consumer buying habits
- Marketing programs
- Trends in pricing
- Others?

Ambrosia

By: Jim Campbell

Horticultural Features of Ambrosia

- Mid Season apple
- Bicoloured
- Attractive
- Very Good Taste
- Storage similar to Gala
- Best stored in CA
- 2 picks are common
- Slow growing tree
- Suited to super spindle
- Must be picked on time
- Large fruit on young trees
- Pollinated by many varieties in mid season

Positive Aspects for Ambrosia

- Excellent eating characteristics
- Attractive variety
- Currently produced only in BC
- Growers have organized a promotion and quality standards council
- Positive consumer reaction
- Enthusiastic grower response

Challenges for Ambrosia

- Not well known by the consumer
- Not produced by other areas
- Special treatment required to retain high eating quality
- Extensively planted by growers - rapid production increases expected

Sustainable Apple Production

By: Ken Haddrell

WHAT IS SUSTAINABILITY?
ACHIEVING SUSTAINABILITY?

WHAT IS SUSTAINABILITY?

- 40 BINS PER ACRE PER YEAR
- 80% EXTRA FANCY
- SIZE 100 AND LARGER

ACHIEVING SUSTAINABILITY?

- Rootstock and Variety
- Site
- Varieties The Golden Egg

ACHIEVING SUSTAINABILITY?
Rootstocks

- Match Rootstocks to the Varieties
- Match Rootstock to Location

ACHIEVING SUSTAINABILITY?
Site

- Vigor
- Quality

ACHIEVING SUSTAINABILITY?
Varieties: The Golden Egg

- ***Everyone wants one, every nursery has one***
- New Gala Strains
- New Fuji Strains
- Future Opportunities and Varieties

The Cherry Deal
By: Ken Haddrell

TOPICS
Who's Gonna
June 26, 1998
Varieties

Who's Gonna

- WHO'S GOING TO PICK THEM
- WHO'S GOING TO PACK THEM
- WHO'S GOING TO SELL THEM

Who's Gonna

- Who's Going to Pick Them
- Where are they coming from

Who's Gonna

- Who's Going to Pack them
- Private
- Co-operative

Who's Gonna

- Who's Going to sell them
- What does your particular packer require.

June 26, 1998

- Stemilt's biggest shipping day ever
- 250,000 cartons
- between 4.5 and 5 million pounds
- the U.S. July 4th weekend
- Unless you have a guaranteed market do not plan on selling many cherries in this week

Varieties

- **Santina**
- 8 days before Van and Bing
- Large for an early season Cherry 9.5g
- Needs GA
- Sweet
- Tree habit is fairly flat, almost weeping
- Self-fertile
- **Sumnue Cristalina**
- 5 days before Van and Bing
- Large
- Needs GA
- Very good taste
- Standard tree habit
- Not self-fertile
- **Sumleta Sonata**
- At least 7 days after Van and Bing
- Very large and Firm
- Tends to split in the dimple. The dimple is a concern as it hold any moisture
- Has Lapins as a parent so dimethoate at full strength may cause leaf drop
- Can have a bitter taste
- Tree habit is standard
- Self-fertile

- **Sweetheart**
- 19 days after Van and Bing
- Very productive, can over crop and produce small fruit
- Needs good management to produce large fruit size
- Very Firm
- Tends to split
- Good taste
- Needs good management to produce a good tree
- Self-fertile
- **Skeena**
- 12 days after Van and Bing, With Lapins
- Large fruit
- Very firm
- Limited splitting
- Very good taste
- Much better tree habit than Lapins
- Self-fertile
- **13S-20-9 Staccato**
- 26 days after Van and Bing
- Large fruit
- Very firm
- Limited splitting
- Nice tree
- Reasonable taste
- Self-fertile

Peaches, Nectarines, Apricots Prunes and Plums

By: Tim Watson

Variety Information

General

- little evaluation of varieties
- plant patents affect importation
- plum pox virus
- Sudden Oak Death Syndrome

Peaches

- increased interest and planting
- market considerations
  - good red colour, not too fuzzy
  - early, Redhaven, high color late varieties
  - large size, firm, ship well, freestone
- sub acid yellow flesh peaches
  - Sweet Scarlet, Sweet Jewel, Country Sweet

Peach Varieties

Early Redhaven	Redhaven	Glohaven	Cresthaven
Angelus	**Flavorcrest**	**Harrow Diamond**	**O'Henry** **John Henry**

Other Varieties

- Flamin' Fury
  - PF 1
  - PF 12
  - PF 15A
  - PF 17
  - PF 23
  - More releases in 2003 and 2004
  - C&O, Van Well
- Stellar Series
  - Rising Star
  - Red Star
  - Blazing Star
  - Starfire
  - Coral Star
  - All Star
  - Blushing Star
- 60%+ red, orange red
- Van Well, Willow Drive

Other Varieties

- Zaiger Genetics
  - Sweet Scarlet –sub acid yellow
  - Lady Series
    - Summer Lady, Red Lady, Elegant Lady, Zee Lady
- Harrow
  - Harrow Dawn
  - Harrow Fair

White Flesh Peaches

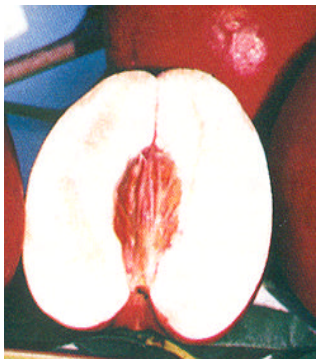
- Large increase in plantings
- 3.5 million boxes, 80% export
- Taiwan market disaster
- Domestic market
- Varieties

  Raritan Rose , White Lady

  Zaiger Genetics Snow series

  Spring Snow to Snow Fall

Nectarines



- market considerations
  - bright red, waxy, size, firmness, yield, hardiness
  - demand for full range of maturity
  - very little demand for white flesh nectarines
    Zaiger Arctic Series

Nectarine Varieties

Crimson Gold	**Early Sungrand**	**Firebrite**
Red Gold	**Independence**	**Fantasia**
Earlisweet	**Harblaze**	**Flavortop**
Sweet Scarlet	**Harrow Beauty**	

Apricots

- Market considerations
  - early, large, firm, flavor, red blush
  - overplanted
  - 2”+
  - export market

Apricot Varieties

Tomcot	**Goldbar**
Goldstrike	**Tilton**
Skaha	**Goldrich**
Rival	**Hargrand**
Harglow	**Harogem**
Harlayne	**2-15-5**

Prunes

- Acreage removed
- early prunes - opportunity
  - biennial, pollenizers, drop, russetting
  - Current strains Greata, Demaris,
- late prunes - some demand
- quality
- Trial New Zealand
  - Late Italian still top quality

Plums

- decision to plant based on your ability to market
- difficult to grow
- Calif 13.3m boxes –declining
  - Angeleno, Black Amber, Friar
- Wash –Black Amber and President

Plum Varieties

Santa Rosa	**Shiro**
Black Ember	**Friar**
June Blood	**Earliblue**
Fiebing	**Ember**
Ozark Gold	**Premier**
Starking Delicious	**Catalina**
Fortune	**Emerald Beaut**

Pluots, Apriums & Plumcots

- Zaiger Genetics – Flavor Series
- haven't turned plum industry around
- early released varieties unstable
- maturity too late
- Flavorosa and Flavor Rich - only Pluots that have really taken off

Pluot Varieties

Flavorella gold-red, early, drops	**Flavorosa** hot variety, purple skin, red flesh,early bloom
Dapple Dandy dinosaur egg, pale green, red spots	**Flavor Supreme** red over grey
Flavor King red, very sweet	**Flavor Queen** Light green – yellow, superb flavor
Flavor Rich hot variety, large, black, very late	

Peaches, Nectarines, Apricots and Plums

There has been a revived interest in planting soft fruits other than cherries, particularly peaches. There has been a significant planting of peaches. There are many new varieties available, but there has been little evaluation of them in our area. Orchardists have tried or are growing new varieties. We have their experience that is useful. We can also interrupt information from other areas to some extent. Some information provided here is from limited experience with varieties and does not necessarily reflect how they will perform for you.

The availability of new varieties is a factor in planning new plantings. Plant patents, plum pox virus and Oak Sudden Death Syndrome influence the availability of varieties to us in B.C.

Peaches

There are a number of market considerations that are important in selecting varieties. Peaches must have good red colour, large size, firmness, ship well, be freestone and have minumum "fuzz". There is an opportunity for early varieties and may be an opportunity for varieties now in the Redhaven season. Supplies of peaches in the Glohaven and Cresthaven season are considered to be adequate by some marketers.

Currently recommended varieties are still acceptable. Other varieties that are grown but have some limitations are Angelus, Flavorcrest, Harrow Diamond and O'Henry.

Some of the Paul Friday Flamin' Fury series have been tried here. In some growers experience they generally and there is difficulty in obtaining good size after the first pick. Some other growers have been very pleased with the varieties they have tried.

Characteristics of Some PF Peaches Grown Here:

- PF1 - clingstone, early, good price, good colour, prune and thin hard for size, doubles, usually low percentage or splits but 60% in 2001
- PF12 - beautiful colour, small fruit
- PF15A - not very suitable
- PF17 - good crop, large size
- PF23 - good in most respects but poor flavour

The Jim Friday Stellar Series is of interest. These are 60% + red orange colour, and all are firm.

Characteristics of some grown locally

Starfire

- very large, 50% bright red, good yield, fruit size declines as tree ages

Allstar

- may be suitable for this area

Blushing Star

- 80% pinkish red, white flesh

Cresthaven Season

- performs well

Zaiger Genetics in California has the "Lady" series of peaches. They have been tried here.

- Red Lady *
- Summer Lady
- Elegant Lady; and
- Zee Lady

* Red Lady has exhibited bud tenderness. The spring frost and winter hardiness of this series in our area is not known.

There are some Harrow varieties that may be worthy of trial.

- Harrow Dawn - semi-cling, excellent size, crops well
- Harrow Fair - 70% orange red
- Harrow Diamond - growers have experience with this variety, very susceptible to powdery mildew if vigorous
- John Henry a sport of O'Henry may be worth trying in warmer sites

White Flesh Peaches

There was a large increase in acreage in California in the mid 1990's. 1998 production was 3.5 million boxes and 80% was exported. Severe marketing problems occurred in 1998 and 1999 and white flesh peaches difficult to sell. The domestic market still needs developing, white flesh peaches are not well known in North America. Interest in new plantings is declining. Zaiger Genetics has a "Snow" series of white flesh peaches with many varieties. There are 200 acres of Snow King, a variety that matures at the end of August, in Washington State.

We have local experience with -

Raritan Rose - older variety grown here for some time

White Lady - almost 100% red skin, very attractive, semi-freestonek crops well

There is a growing interest in yellow sub acid peach varieties. Sweet Scarlet has been grown here. Sweet Jewel and Country Sweet are two other varieties.

Nectarines

Marketers have indicated that there is a demand for a full range of maturity of nectarines that are bright red, waxy, large size, firm and with adequate hardiness and good yields.

Varieties of interest -

- Firebright - has performed well
- Redgold - still the "standard", excellent variety
- Independence - performed well for some growers
- Fantasia - poor colour, tends to be soft
- Earlisweet - possibly worth trying
- Harblaze - possibly worth trying
- Flavortop - has done well for some growers
- Harrow Beauty - very attractve, good flavour, soft

There is very little interest of demand for white flesh nectarines. Again ***Zaiger Genetics*** has an "Artic" series of white flesh nectarines with a large number of varieties.

Apricots

Apricots are considered to be overplanted in our area by some marketers. It may be possible to develop an export market. Apricots have the best marketing potential if they are early , large, firm, have a good red blush and have good flavour. There has been very few apricots planted recently. Goldbar and Goldstrike has been the varieties planted in any significant quantity.

Characteristics of some varieties -

- Tomcot - very early, good colour, good flavour, set very heavy and needs heavy pruning and thinning to obtain good size, yields poor but good returns
- Goldbar - early, large, attractive, poor flavour
- Goldstrike - early, large, attractive, poor flavour
- Rival - good colour, medium yield, acceptable variety

Harrow Series

- Hargrand - very large, yellow orange, firm, good production
- Harogem - bright red, glossy blush, good flavour, productive, hardy
- Harcot - deep gold, red blush, firm

Prunes

There has been significant acreage removed in this area in recent years. Markets have indicated some demand for early prunes. There are problems in growing early prunes, they are biennial, require pollinizers, drop and russet. Again there is some demand for late prunes. Yields are generally better for late strains of prunes. There has been little new information on prunes. Nurseries do not always identify strains. A recent trial in New Zealand that compared over 20 types of prunes from North America, England, France, Germany and Czechoslovakia indicates that Late Italian prune is still the best prune in their evaluation. Stanley performed well and so did Oneida, an early prune available in the U.S.

Plums

The decision to plant plums should be based on your ability to market plums or have a seller that can market plums well for you. Some growers do well, others cannot sell what they grow.

Suitable current varieties or with potential:

- Black Ember - beautiful, large, good flavour, crops poorly
- Friar - attractive, better yields than Black Ember
- Fortune - red colour, very much in demand by local buyers, poor yields
- Emerald Beaut - green, may be suitable
- Catalina - dark purple to black, yellow flesh, very good sweet flavour

Pluots, Apriums & Plumcots

These may be worthy of consideration in our area. Pluots and Apriums are registered trademarks of Zaiger Genetics. Pluots were supposed to be the saviour of the plum industry in California but this hasn't happened. There have been problems with cross incompatibility, unstable varieties, low yields and market identity. New varieties are improved.

- Flavorosa - only variety that has really done well, purple skin, red flesh, probably the best suited to our area but blooms early and may be frost tender
- Flavor King - red, very sweet, matures in mid-late August, may also be worth investigating

The availability of Pluots and Apriums may be limited in BC.

Economics of Replanting- An Overview

By: George Geldart

- George Geldart, Business Management Specialist, BCMAFF
- Economic Study
  - November 99
  - Clint Ellison
- Establishment Budgets- Planning for Profit Series 2001 (http://fbminet.ca/bc)

Issues and Questions

- Costs & Returns
- Planting Densities
- Profitability
  - Discounted Costs / Income
- Cash flow considerations
- Nursery Trees vs. Benchgraft
- Risk Factors

Planting Yr. Costs- 1,742 t/ac

- Nursery Trees / Support System ($15,078)
- Planting / Installation ($2,700)
- Irrigation ($1,500)
- Land Clearing & Preparation ($1,375)
- Soil Amendments ($1,050)
  - *(Labour component)*

Establishment Costs- Apples

Tree Density	Nursery Tree	Benchgraft
trees per acre	– $ per acre –	
726	12,301	9,608
990	14,943	11,270
1452	19,565	14,179
1742	22,467	16,004
2489	29,941	20,707

Production Expectations

- Early, High Level of Production
- Quality Standards
  - Color
  - Size
  - Other
- Consistency / Sustainable High production

Target Yields- Apples

Nursery Tree vs. Benchgraft Production Targets 1,742 t/ac (Apples)

Year	Planting	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Nursery Tree	0	8,628	17,442	25,214	34,288	36,000	36,000
Benchgraft	0	0	8,628	17,442	25,214	34,288	36,000

Pounds per Acre

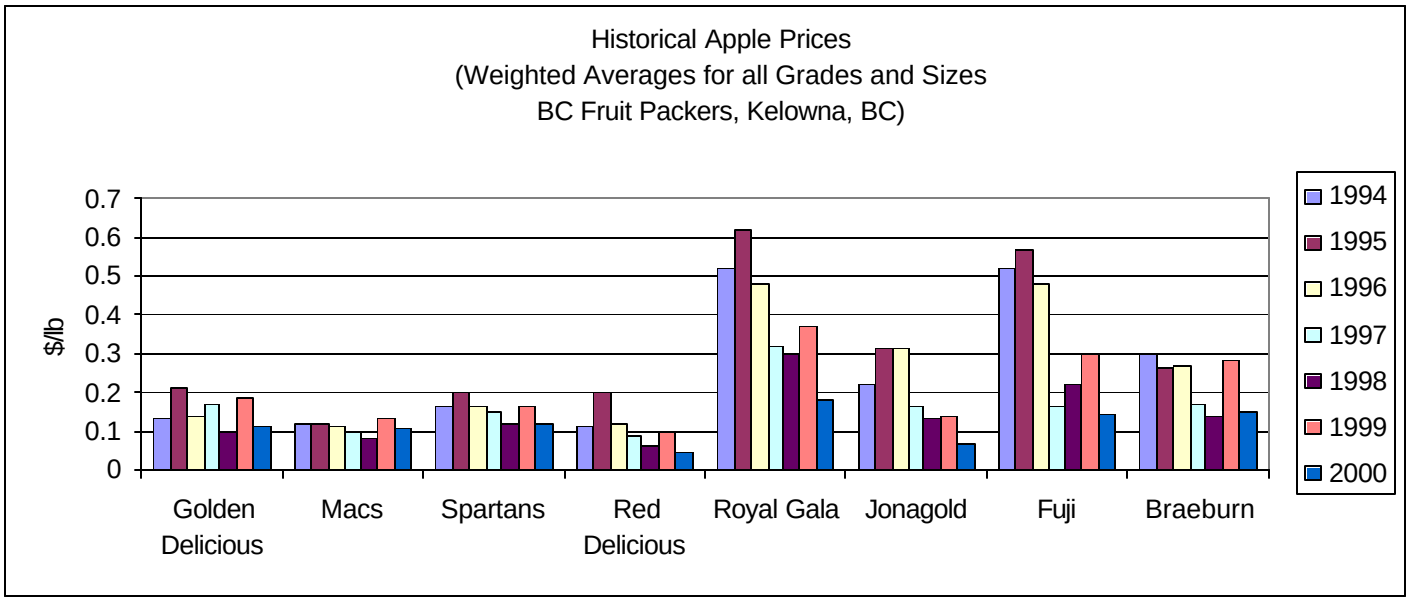
Avg. Yields/acre
Various Densities- Apples

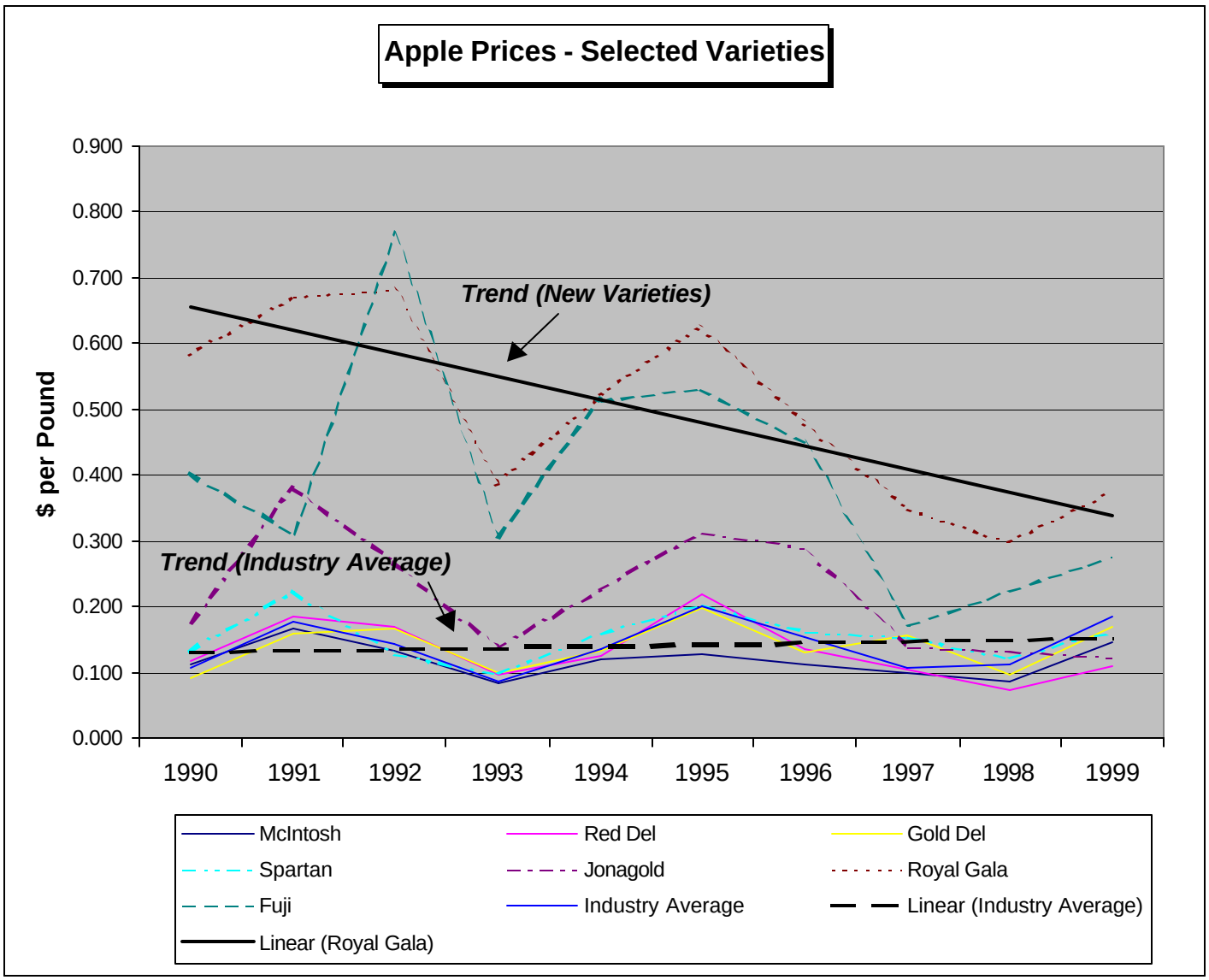
	2nd leaf	3rd leaf	4th leaf	5th leaf	6th leaf	7th leaf
All Densities	3,374	10,215	16,193	19,907	23,458	26,439
< 800	1,762	6,199	10,286	15,779	16,872	24,309
800 – 1200	2,029	7,178	13,899	18,199	24,182	29,821
1200 – 1500	4,854	14,923	21,415	29,779	33,198	39,698
1500 – 2000	8,628	17,442	25,214	34,288	44,053	N/A
> 2000	7,518	21,575	30,454	30,381	44,694	N/A
Red Delicious	20,524	20,524	20,524	20,524	20,524	20,524

** Production Survey Results (OVTFA)

Price Expectations

- Capture High Initial Prices
  - New Varieties
- Market Returns
  - Traditional
  - Niche
- Price Trends / Competition





Assessing Replant

- Investment Analysis
  - Economics / Internal Rate of Return
  - Feasibility- Cash flow Needs
- Returns
  - # years to full production
- Variety and Density
- Risks

Internal Rate of Return- 10 years

(full production at 36,000 lbs. per acre)

	Tree Density (trees per acre)				
	726	**990**	**1452**	**1742**	**2489**
Nursery Trees					
20¢/lb.	2.48%	4.83%	4.83%	3.30%	(2.81%)
25¢/lb.	9.52%	12.94%	13.99%	13.25%	6.68%
30¢/lb.	15.21%	17.29%	18.50%	17.34%	10.66%
Benchgraft					
20¢/lb.	(0.12%)	3.87%	5.68%	4.88%	(0.22%)
25¢/lb.	6.94%	11.57%	14.44%	14.52%	8.99%
30¢/lb.	12.48%	15.95%	18.90%	18.58%	13.17%

** Production in Year 2

Price Sensitivity

Table 2 ***Cost Recovery Price – 10 Years***

(3 maximum production levels)

	Tree Density (trees per acre)				
	726	**990**	**1452**	**1742**	**2489**
Nursery Trees			**$/lb.**		
32,000 lbs.	0.185	0.172	0.174	0.182	0.217
36,000 lbs.	0.185	0.164	0.164	0.169	0.203
40,000 lbs.	0.185	0.159	0.156	0.159	0.191
Benchgraft			**$/lb.**		
32,000 lbs.	0.201	0.177	0.169	0.174	0.201
36,000 lbs.	0.201	0.170	0.161	0.163	0.190
40,000 lbs.	0.201	0.167	0.154	0.154	0.180

Nursery Trees / Benchgrafts

Nursery Trees ** Production in Year 2

1742 trees per acre

	Total Production	Total Revenue	Establishment Costs	+	Direct Expense	=	Total Expense	Cumulative Cash Flow
8 years	193,572 lbs.	$48,393	$22,467		$16,755		$39,223	$9,170
10 years	265,572 lbs.	$66,393	$22,467		$22,451		$44,918	$21,475
12 years	337,572 lbs.	$84,393	$22,467		$28,146		$50,613	$33,780

Benchgrafts ** Production in Year 3

1742 trees per acre

	Total Production	Total Revenue	Establishment Costs	+	Direct Expense	=	Total Expense	Cumulative Cash Flow
8 years	157,572 lbs.	$39,393	$16,004		$15,627		$31,631	$7,762
10 years	229,572 lbs.	$57,393	$16,004		$21,322		$37,326	$20,067
12 years	301,572 lbs.	$75,393	$16,004		$27,017		$43,021	$32,372

Staying with Reds vs. Renewal

Table 6 - 10 Year Sensitivity Tests for Economic and Financial Indicators, Traditional Red Delicious

	Red Delicious 290	New Variety 726	New Variety 1742
Price per lb.	$0.1216	$0.2500	$0.2500
Accumulated Production	205,240 lbs.	122,396 lbs.	229,572 lbs.
Net Present Value @10 Years	$2,303	($733)	$6,831
Accumulated Cash Flow after 10 Years	$3,471	$6,034	$21,829

Planting Densities- Results

- 1500 - 2000 t/ac appear to meet profitability and cash flow needs (apples)
- All densities performed better than maintaining existing Red Delicious Planting
- Cherries and other soft fruits have potential (higher priced fruit)
- Some higher prices / but higher risk

Risk Factors

- Market Changes (price)
- Production
  - yield levels (timing)
  - quality (disease, size, color)
- Financial & Business Risk
  - debt and cash flow requirements
- Consider Risk Management Tools

Key Factors in Success

- Price
  - Variety
  - Quality
- Yield
- Costs
- Management
  - Financial / Horticulture

Summary - Due Diligence

- Assess all factors
- Economics gives guidance to profit potential.
- Financial factors include the Replant Grants and other sources of financing to meet feasibility (match financing to payback period)
- Farm Business Plan

Okanagan University College

- BCFGA- Orchard Business Management Series
  - Lee Cartier
  - Guest Lecturers

Sensitivity Analysis

- Price
- Yield
- Costs
- Financing
- Other

Apple Planting
and
First Year Management
By: Peter Waterman

Planting Practices…..

- ARE CRITICAL

They ----

- Influence Vigor
- Influence Growth
- Affect Cropping Potential

Planting

- Site Prep:
  - Tree & Root removal
  - Ripping
    Lime
  - Spading & Rotovating

PH Check
- Lime
- Dolomitic

- Replant Disease
  - Replant - fumigate
  - 11-55-0 (1.5 gm/1 soil)
  - 12" hole (40 gram)
    (2¾ teaspoon)
  - Nematode check

- If timing does not allow fumigation
  - Use peat plus 11-55 or fertigate well with phosphorus

Irrigation/Fertigation System is ready to Go!!

- Problems of Augered holes
  - Trees sink
  - Creates glazed pot effect in silts and clays

- Planting by Hand
  - Most effective method
  - Watch amount of 11-55 if using smaller holes

- Planting machine

- Soak Trees
  - Particularly if they have been stored

KEEP TREE ROOTS MOIST

- Cover trees in Transit

- Root trimming
  - Trim broken roots
  - Remove galls
  - Hold tree horizontal and trim roots that are loose and fall away (hanging down loosely)

- Union height
  - Placing union too low is one of the worst problems
  - Scion rooting starts and dwarfing effect is lost
  - Be sure union is at least 10 cm above final soil level

B4 Pruning and Heading

- Union away from post
- Lean tree away from post
- Once tree roots anchored---
- Tie tree to post
- Pull tree towards post to cause tension between tie and tree
- Tree 3’’- 6’’ from post

Light Penetration & Distribution

- Governs tree structure
- Determines pruning details

Feathered Tree

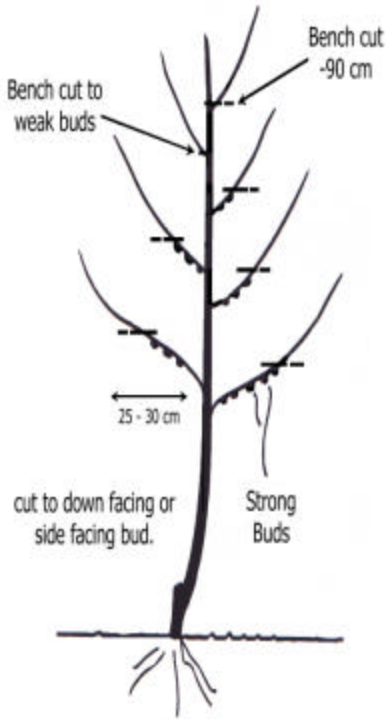
- To be called a feathered tree it must have at least four (4) feathers 50 cm above ground

- If less than four (4) heathers – Remove them all
- If feathers are not balanced (all on one side) – Remove all feathers

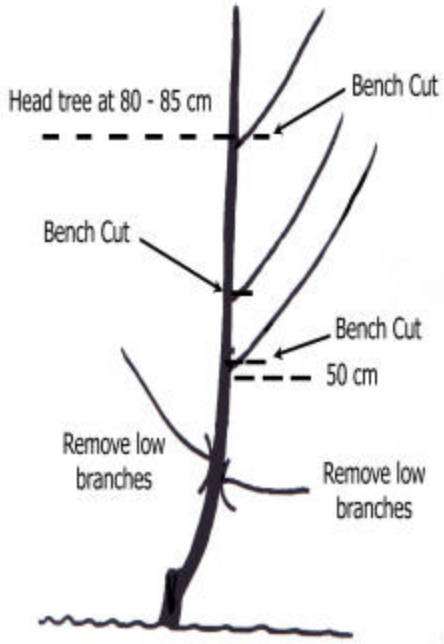
Heading Tree

- Spindle Trees (3.5 feet and greater between trees)
- Well feathered
  - Head no higher than 90 cm
- Whip
  - Head at 80 to 85 cm
  - Varieties that do not branch easily head at 70 to 75 cm
- This is absolutely critical to develop a strong basal set of branches

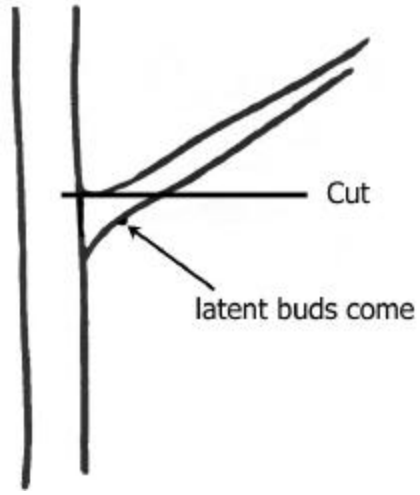
Pruning Well Feathered Trees



Pruning Poorly Feathered Trees



Pruning Feathers



- Poorly feathered
  - Less than 4
  - Not evenly spaced around tree
- Remove with bench cut

Feathered Trees

- 2 – 3 feet apart
  - Do not head
  - Cut back feathers
  - Some varieties delay heading feathers

Systems- What's Best?

Tree handling- after planting

- Super Spindle - (2.5 ft in row and less)- no heading of leader under any circumstances
  - heading trees at this spacing ruins the vegetative balance in the tree, vigor rushes to the cut resulting in strong branches, that will have to be removed

Pruning Summary

- Think of light
- Think of Vegetative/Fruiting balance
- Think of more **dards** and fruiting breaks
- The previous discussion is an attempt to guide the tree to result in a "soft" productive, well balanced tree
- This is done while feeding to enhance growth and achieve balanced regular cropping

Bench-grafts

- Are the choice to achieve the necessary densities at a reasonable cost
- But they are only a choice if you can minimize losses, otherwise it is better to plant healthy whips of good caliper or
- Sleeping eyes are also a choice and may be more successful
  - More root
  - More carbohydrate storage

Risk

- Grower assumes risk normally taken by the nurseryman

- Ambrosia/bench-graft losses seem to be higher than normal for bench-grafts

- Losses range up to 30% and higher

Bench-Grafts

- Bench-grafts generally appear to be more sensitive to soil moisture and soil temperature than sleeping eyes and trees.

- Ambrosia may be particularly sensitive this may be especially so for Ambrosia on M9. Bud 9 seems to be more successful

- Soil moisture

  – Irrigate prior to planting, or prior to laying plastic

  – Don’t over do it, just nicely moist to 10 to15 cm

  – Bench-grafts will not need watering again until they start to push leaf, even then check with the squeeze test

- Excessive water tends to create very cool soil temperatures in April and May
- Easy for Phytophthora or crown rot and other soil borne disease to get started
- May need to apply Alliette * as a soil drench or foliar plus soil drench
- Note: Alliette is not registered for use on Cherries
- Drip irrigation may only be required for 15 or 20 minutes every other day once growth starts, increase time and frequency as growth and conditions demand
- Charge the lines with water for 5 minutes and start fertigating with a very concentrated solution and fertigate for the 20 minutes or so that is needed for watering, don't worry about clearing lines

High Phosphorus

- Most bench-grafts seem to do well on about 20 to 30 gms of P205 per plant, verses 55 gms to 60 gms for trees
- With 10-34-0 that's about 60 ml in total per plant to be applied in the early part of the season
- Apply as much as you can over the first month without over watering, you can supplement with additional N once there is more leaf surface

Fertigation

- If you are really restricted by slow injection rates due to low pressure or a narrow pressure differential, you can't afford to fertigate and irrigate for extended lengths of time
- Fertigate only as long as necessary for watering. If you can't irrigate, foliar feed
- Supplement with a weekly foliar program with 20-20-20 plus Magnesium, Zinc and Boron

Non-fertigated

- Side dress with high P fertilizer
- Break the 20 to 30 gms into several applications to avoid salt burn
- Shallow root system – water for short periods of time and monitor with squeeze test

Bench-grafts

- Success
- Good consistent management
- Pay attention to each operation
  - land prep, spade deeply to facilitate good drainag
  - handle plants carefully, grafts can break, no air gaps – two finger test
  - soil moisture – monitor carefully
  - inspection for pests, diseases,
  - staking
  - disbudding
  - weed control

Support Systems - What's Best

- **Density**
  - under 3 ft between plants - post and wire
  - 3 ft and wider many growers use single posts
  - most growers are choosing 9 to 10 ft row
  - space and 18 in to 3 ft between plants, a very common space is 2 ft by 10 ft or 2178 trees/A

Systems - What's Best?

- **Support System**
  - end posts - 12 ft preferred (driven 4 ft)
  - can use 10 ft post driven 3 ft (much more strength than augered) must be 4 to 5 inches in diameter
  - line posts - 10 ft (3 to 4 inches) driven, no more than 30 ft apart
  - end construction- preferred- angled post with anchor(anchor same distance from post as top wire from ground) use heavy 4 ft anchor

Systems - What's Best?

- **Post and wire**
  - minimum of 4 wires, (wires- 2.5 ft, 2 ft, 1.5 ft, 1ft)
  - staples - then run wires (do not risk hitting wire)
  - or run wires through posts
  - securing ends- wire vice, and sleeve, or 2 gripples
  - anchor wire- heavier gauge - gripple for tightening
  - things to watch- staples - do not drive vertical
  - use staples to prevent wire from digging into post
  - do not over-tighten wire

Cherry Planting
and
First Year Management

* * *

Cherries – Central Leader “Okanagan”

- Variations and Combinations of the “Vogel” spindle and “Zahn” Spindle
  - Spacing 1 to 3 m by 4 to 5 m

- Common Techniques
  - Bending/ scoring
  - Bud removal/ Pinching (hard and soft)
  - Spreaders
  - Toothpicks
  - Pruning
  - Promalin

Vogel Spindle

- **1st Year**
  - Head at 36”
  - Remove buds 8” below leader bud
  - Spread developing shoots

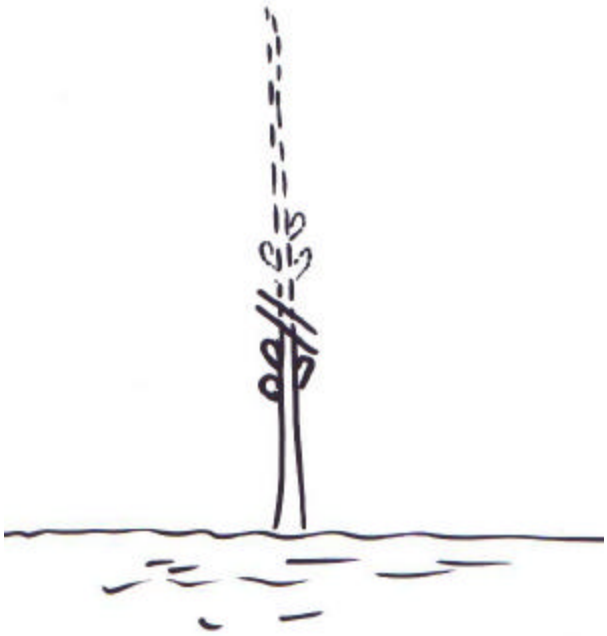
- **2nd Year**
  - Head leader at bud swell prune off 1/3 of leader
  - Remove five (5) buds below leader bud

Zahn Spindle

- **1st Year**
  - Head at 48”
  - Remove 60% of the buds below the leader
    - Remove 2 - leave 1
    - Spread shoots

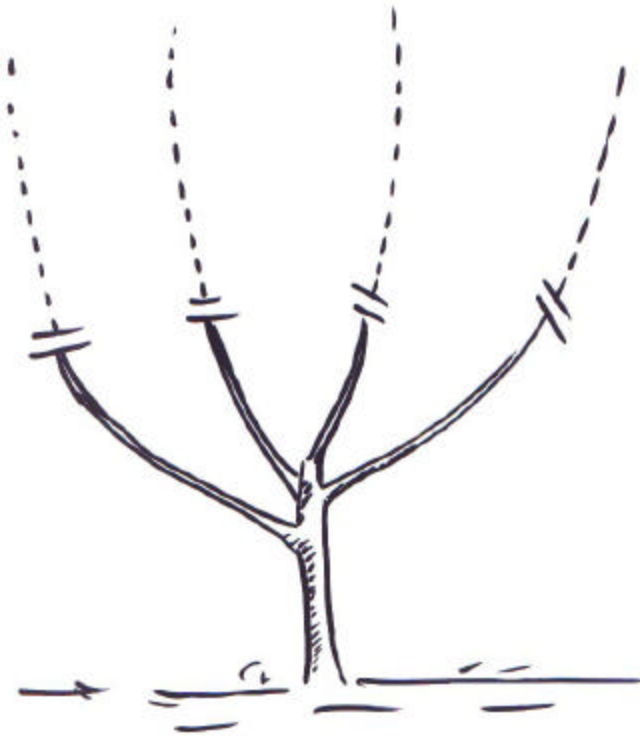
- **2nd Year**
  - Do not head leader
  - Stub large branches
  - Remove 60% of buds along the leader

Cherries - Spanish Bush



- **Planting**
  - Plant trees 8-10 ft x 15-18 ft
  - Head 12-30” above growth
  - Check for live buds
  - Spread new shoots (good Branch Angles)

Cherries – Spanish Bush
First Growing Season



- Allow primary branches to grow to ~ 20 –24”
- Cut back to 6 inches above 1st heading cut

Cherries – Spanish Bush

- **End of First Season**

Weed Control in New Plantings

By: Gene Hogue

- **Planting site preparation:**

  Control perennials:

  quackgrass, vetch, brome,

  bindweed, horsetail, scouring rush

- **Non-chemical control:**

  Tillage: Weed Badger, Zeller & Sons

  Mulches: organic, plastic, geotextile

- Chemical control:

  Non-residual

  Residual

Perennial Weed Control - PREPLANT

- **Quackgrass, mountain brome: 5 L/ha or 2 L/A ROUNDUP**
- **Field bindweed: 10 L/ha or 4 L/A ROUNDUP**
- **Perennial vetch: 0.5 L/ha or 0.2 L/A LONTREL**

4) Horsetail, scouring rush: 15 L/ha or 6 L/A Amitrol 240

Chemical Control in New Plantings

Non-residual chemicals

Annual grasses and quackgrass

- **Fusilade II: 1-2 L/ha (0.4 – 0.8 L/A)**
- **Poast Ultra: 0.35 – 1.1 L/ha (0.15 - 0.45 L/A)**

Grasses and Broadleaf Weeds

- **GRAMOXONE: 5.5 L/ha (2.2 L/A)**

Broadleaf Weeds

- **BASAGRAN FORTE:**

  2.25 L/Aha (0.9 L/A)

Chemical Control in New Plantings

Residual Chemicals

Annual grasses (and some broadleaf weeds)

- **PROWL: 4.2 L/ha (1.68 L/A)**
- **DUAL Magnum: 1.5 L/ha (0.6 L/A)**
- **DEVRINOL: 9 kg/ha (3.6 kg/A)**

Broadleaf weeds (and some grasses)

- **CASORON: 110 kg/ha (45 kg/A)**
- **SIMAZINE, PRINCEP: 1.25, 1.1 kg/ha (0.5, 0.44 kg/A)**
- **SINBAR: 0.9 KG/HA (0.35 Kg/A)**

In New Plantings

- **Consider full season weed control**
- **Direct herbicide applications to avoid green bark and foliage**
- **Apply residual herbicides to “settled” soil**
- **Calibrate herbicide sprayer and do not exceed recommended rates**

In New and Established Plantings

- For best activity, apply residual herbicides to weed free soil and “activate”
- Combine chemical control with non-chemical methods: integrated weed management
- At low rates, combine broadleaf with grass controlling chemicals
- Apply chemicals only in the best conditions

In Established Plantings

- **Rotate use of residual and non - residual chemicals**
- **Additional non-residual chemicals available: glyphosate (ROUNDUP, TOUCHDOWN), IGNITE, 2,4-D**
- **Consider reducing late season weed control**
- **Read and observe product label**

SOME IDEAS ON THE FUTURE OF THE BRITISH COLUMBIA TREE FRUIT INDUSTRY

By Robert Dawson

It has been estimated that on average, economic forecasters for many industries can achieve a degree of accuracy of approximately 75% looking forward five years, but that this will drop to at best 50% looking ahead ten years. The following thoughts will focus on the next five to ten years for BC's tree fruit industry.

IN GENERAL:

- For many, if not most growers, the next ten years will offer better prospects for many growers than the past ten years.

- The future evolves from the present. It seldom appears as a radical change not seen before. BC's orchards in five to ten years will look like the best of those seen today. There will, however, be many more of these better plantings.

- Quality and consistency will be even more important.

- Those growers who succeed will think in terms of doing whatever is possible to improve their operations and the quality and yield of the fruit they grow. They will not waste time waiting for someone else, including government, to help them.

CHERRIES:

- Production will climb rapidly. The mediocre fruit will soon experience severe price pressure. The growers of high quality, large fruit, especially those with some of the newer varieties, will continue to make money. Some will make a lot of it. New rootstocks and training methods will continue their rapid evolution.

OTHER SOFT FRUIT:

- California will continue to dominate the wholesale trade, with Washington State becoming a more important competitor. For BC growers, niche markets, direct marketing, tree-ripened fruit, organically grown and other special approaches will offer opportunity.

PEARS:

- Pear production will remain high relative to demand. Many new plantings have been made in the past ten years and existing growers will hang on to their plantings. They know that it takes a long time to establish a pear orchard and that the productive life expectancy of such orchards is longer than that of other tree fruits. Bartlett, Anjou and Bosc will remain the dominant varieties. MCP could give a great advantage to Bartletts by extending their storage life.

APPLES:

- Washington State apple production will decline. Red Delicious will continue to lose market share and over 30% of these orchards will be removed. Orchards with vigorous rootstocks and older strains of the newer varieties such as Gala and Fuji will also be removed, especially from the hotter areas.

- Buyers and sellers will continue to consolidate into bigger organizations.

- New varieties will continue to take market share. The Washington State Apple Commission estimates that as much as 65% of their production will be other than Red and Golden Delicious.

- High density plantings will continue to increase. Faster production, better yields, higher quality fruit and a smaller and older work force will all drive this trend.

WORLD APPLE PRODUCTION TRENDS:

There is growing evidence that the flow of investment into apple production is drying up. The supposed benefits of economy of scale have not proven out and the failure of a number of large integrated operations will give bankers and others cause to be wary before re-entering the tree fruit industry for many years. The balance of supple and demand will begin to favour producers again.

On a global basis the change in production of varieties evolves slowly. By 2010 the largest variety, Red Delicious, is expected to fall from 20% to below 17%. This will put it in second place, just behind Golden Delicious, which will also decline, but not as quickly. The big winner will be Gala, which will increase from 7% to about 10%. Fuji (not including China's Fuji production which is seven times greater than the rest of the world's Fuji production combined) will increase from 5% to over 6% putting it in fourth place. Granny Smith production will decline slightly, falling just behind Fuji. The next five apple varieties are Jonagold, Idared, Jonathan, Braeburn and McIntosh. Their production will vary from reasonably steady to slow decline. These top 10 varieties together will continue to make up about 70% of all apple production. The next 30 varieties will make up most of the balance. Of these only three will exceed 1% of total production.

No emerging variety appears to have the potential to equal the impact of Jonagold and Elstar in the 1980's (mostly Europe) or Gala and Fuji in the 1990's (many producing areas). The five leading new varieties are probably Pink Lady, Pacific Rose, Honeycrisp, Cameo and Ambrosia. All will have a challenge to gain a substantial piece of the world market.

Replant Regional Report 1991-2001

Apple			North	Central	South	Creston	Total Acres
		Ambrosia	70	36	71	1	178
		Braeburn	45	15	82	0	143
		Fuji	224	49	283	0	555
		Gala	1023	287	628	68	2005
		Golden	48	6	13	4	71
		Granny Smith	60	13	21	0	95
		Spartan	230	43	24	52	349
		Sunrise	38	26	46	0	110
		Other	446	99	177	80	802
	Total		2184	573	1346	206	4309
Apricot							
		Goldbar	1	11	29	0	41
		Goldstrike	0	11	28	0	40
		Perfection	0	5	17	0	22
		Rival	7	1	12	0	21
		Other	5	9	39	0	54
	Total		14	38	125	1	178
Cherry							
		Lapins	167	102	215	207	691
		Skeena	17	8	10	5	41
		Staccato	20	15	2	0	37
		Sweetheart	93	38	45	45	221
		Other	86	16	75	4	181
	Total		383	179	347	261	1170
Nectarine							
		Redgold	2	4	44	0	50
		Other	2	4	56	0	62
	Total		4	8	100	0	112
Peach							
		Cresthaven	2	9	61	0	72
		Early Redhaven	1	3	57	0	61
		Glohaven	12	15	69	1	97
		Redhaven	4	11	74	4	94
		Other	9	14	119	4	146
	Total		28	51	381	9	469

Replant Regional Report 1991-2001

Pear							
		Anjou	13	2	4	2	20
		Bartlett	21	5	9	5	40
		Other	13	7	24	1	46
	Total		47	14	37	8	106
Plum/Prune							
		Italian	2	2	30	1	36
		Other	5	2	25	0	31
	Total		7	4	55	1	67
GRAND TOTALS							
	APPLES		2184	573	1346	206	4309
	SOFT FRUIT		483	294	1045	281	2102
	TOTAL		**2667**	**867**	**2391**	**487**	**6411**
AREAS							
NORTH		**Kelowna, OK Centre, OK Mission, Oyama, Westbank**					
		Vernon, Salmon Arm, Winfield, Armstrong, Lake Country					
CENTRAL		**Penticton, Summerland, Naramata, Kaleden, Peachland**					
SOUTH		**Oliver, Osoyoos, OK Falls, Keremeos, Cawston**					
CRESTON		**Creston, Erickson, Robson, Wyndell, Cranbrook**					

Replant Acreage Summary

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Apples											
Ambrosia	0	0	0	0	0	2	4	8	12	59	93
Braeburn	10	27	31	21	19	5	6	5	5	9	5
Fuji	109	101	57	79	69	54	43	18	3	12	10
Gala	129	80	86	134	166	274	385	274	207	179	91
Golden	8	3	2	2	4	15	18	5	4	3	6
Granny Smith	6	1	4	0	0	0	2	11	14	35	21
Spartan	69	49	47	31	28	33	13	9	18	40	11
Sunrise	9	27	31	29	5	4	1	0	1	2	0
Other	246	139	78	59	30	23	64	59	48	37	18
Total	**587**	**425**	**337**	**356**	**322**	**410**	**537**	**391**	**312**	**375**	**256**
Apricot											
Goldbar	0	0	1	2	5	11	6	4	4	6	1
Goldstrike	1	0	5	4	5	9	8	2	2	3	0
Perfection	3	2	3	2	4	1	2	1	1	1	0
Rival	9	3	0	2	2	3	2	0	0	1	0
Other	12	5	5	5	5	5	7	2	2	4	3
Total	**25**	**10**	**15**	**15**	**22**	**29**	**25**	**8**	**10**	**14**	**5**
Cherry											
Lapins	15	22	18	49	27	43	167	132	69	82	66
Skeena	0	0	0	0	0	0	0	0	2	20	19
Staccato	0	0	0	0	0	0	0	0	0	3	34
Sweetheart	4	0	22	22	15	24	23	23	29	31	27
Other	10	0	7	5	3	16	6	13	60	24	37
Total	**28**	**22**	**47**	**76**	**46**	**83**	**196**	**169**	**160**	**161**	**182**
Nectarine											
Redgold	9	4	1	1	4	4	3	2	6	2	12
Other	8	5	5	4	3	2	4	2	4	5	20
Total	**17**	**9**	**6**	**5**	**7**	**6**	**8**	**5**	**11**	**7**	**32**

Replant Acreage Summary

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Peach											
Cresthaven	7	5	2	2	8	7	7	5	11	10	8
Early Redhaven	4	2	4	4	5	9	13	3	2	5	9
Glohaven	3	10	5	5	8	10	8	8	8	16	17
Redhaven	4	18	2	7	5	13	10	5	8	8	15
Other	10	9	4	11	10	10	4	8	36	21	23
Total	**27**	**44**	**18**	**29**	**36**	**47**	**43**	**28**	**66**	**60**	**72**
Pear											
Anjou	1	2	0	1	3	3	0	0	2	2	6
Bartlett	1	0	0	2	10	4	7	3	1	4	7
Other	9	6	3	4	4	7	2	0	1	3	8
Total	**12**	**8**	**3**	**7**	**16**	**14**	**10**	**3**	**4**	**8**	**22**
Plum/Prune											
Italian	1	1	0	5	1	2	10	1	4	6	6
Other	2	1	0	1	5	2	1	1	5	3	9
Total	**3**	**2**	**0**	**6**	**6**	**5**	**11**	**2**	**9**	**10**	**14**
Total Apples	587	425	337	356	322	410	537	391	312	375	256
Total Soft Fruit	112	96	88	138	132	184	292	215	260	259	327
Grand Total	**699**	**521**	**425**	**494**	**454**	**594**	**829**	**605**	**572**	**634**	**583**
1991 includes ARDSA acreage											
2001 acreage not finalized											