

URBAN AGRICULTURE & FRUIT OPTIONS FOR THE FRONT RANGE

Varieties & Cultural Methods

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PRESENTATION TOPICS

- **Front Range Climate Parameters**
 - Protected Growing Methods
 - Front Range Fruit & Vegetable Growing Opportunities
 - Good & Poor Performance List
 - Fruit Type & Variety Recommendations
-

STANDARD CONDITIONS

CASTLE ROCK (6000-6400')

- 130 Frost Free Days
 - 14-18" precipitation
 - Last Frost: May 15-20 (Sometimes Earlier)
 - First Frost: Sept. 20-Oct. 5
 - Low cumulative heat (e.g. 2000-2500 GDD)
 - USDA Hardiness Zone 5
 - Occasional -20°F Winter Lows

 - Benefit: Cool nights help set sugars for sweeter fruit
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TOP 4 OBSTACLES TO FRUIT PRODUCTION ON THE FRONT RANGE

1. Late Winter Warm-ups + Late Spring Frosts
 2. Hail
 3. Bird Predation
 4. Desiccating Winter Winds
-

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PROTECTED GROWING

- May Cover with:
 - Agribon non-woven fabric
 - Plastic
 - Shade cloth
 - Hail cloth
 - Bird netting
 - Insect screening
 - Hardware cloth/chicken wire
 - Supplemental heat possible
 - Misting possible
-

PROTECTED GROWING RAISED BEDS



AGRIBON TYPE FABRIC

Agribon Characteristics

- Non-woven fabric (like a dryer sheet)
- 4 different weights
- Reduces sunlight intensity (10-70%)
- Frost protection (2-8° F)
- Bird, insect, rain & light hail protection
- Wind reduction
- Rips easily
- Can 'float' or be used over supports



SEASON EXTENDERS

Plastic Mulch



Floating Row Covers



PROTECTED GROWING LOW TUNNELS



SEASON EXTENDERS

Low Tunnels



SEASON EXTENDERS

High Tunnels



PROTECTED GROWING HIGH TUNNELS



SEASON EXTENDERS

High Tunnels



High Tunnels + Floating Row Covers for Cold Nights



SEASON EXTENDERS

Greenhouses



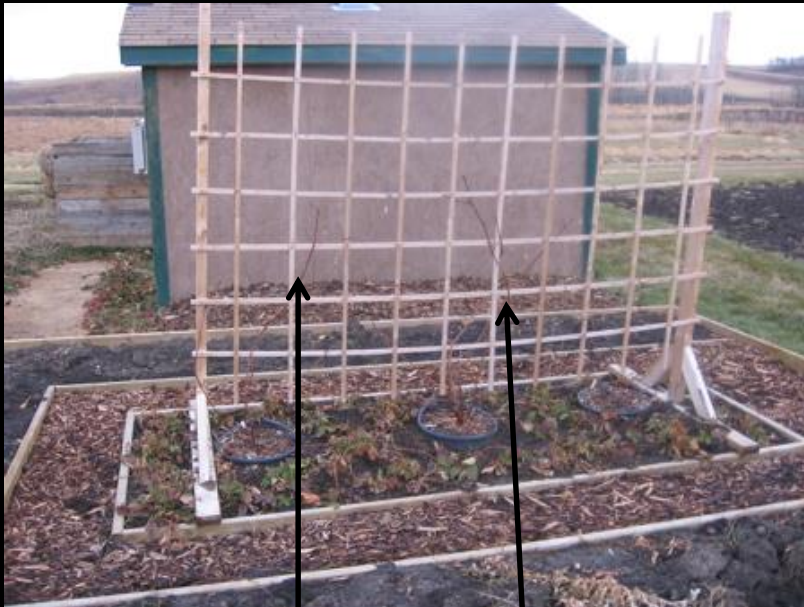
COLD FRAMES



CLOCHES



LAYING CANES/VINES OVER & MULCHING



Vines/Canes during growing season



Vines mulched for winter

BIRD & HAIL NETTING



NETTING CAN BE SIMPLY FUNCTIONAL... OR BEAUTIFUL



BREAK-AWAY HAIL NETTING



SHADE CLOTH (USE 30-40% CLOTH)

- Reduces sunlight intensity (30-90%)
- Reduces temperature
- Bird, hail & insect protection
- Wind reduction



NETTING EXCLUDES BIRDS CHICKEN WIRE EXCLUDES RABBITS & SQUIRRELS



WRAP OR WHITEWASH TRUNKS RABBITS, SUNSCALD, FREEZE & BLOOM DELAY



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SMALL PLOT INTENSIVE (SPIN) AGRICULTURE

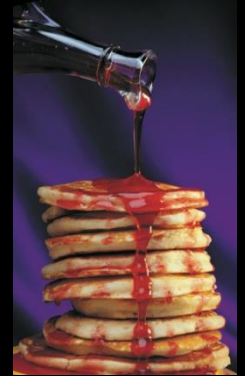
Fruit with Micro-Farming potential



SPIN AGRICULTURE: ANNUAL VEGETABLES



VALUE ADDED PRODUCTS INCREASING PROFITS ON MICRO-AGRICULTURE



EDIBLE LANDSCAPING

Landscape Contains:

Pie Cherry Tree

Italian Plum Tree

4 Saskatoon Bushes

2 Bush Cherries

2 Honeyberry (Haskap)

3 Seaberry

2 Hazelnut

1 Red Currant

2 Grape Vines

Traditional & Alpine Strawberry
Edging

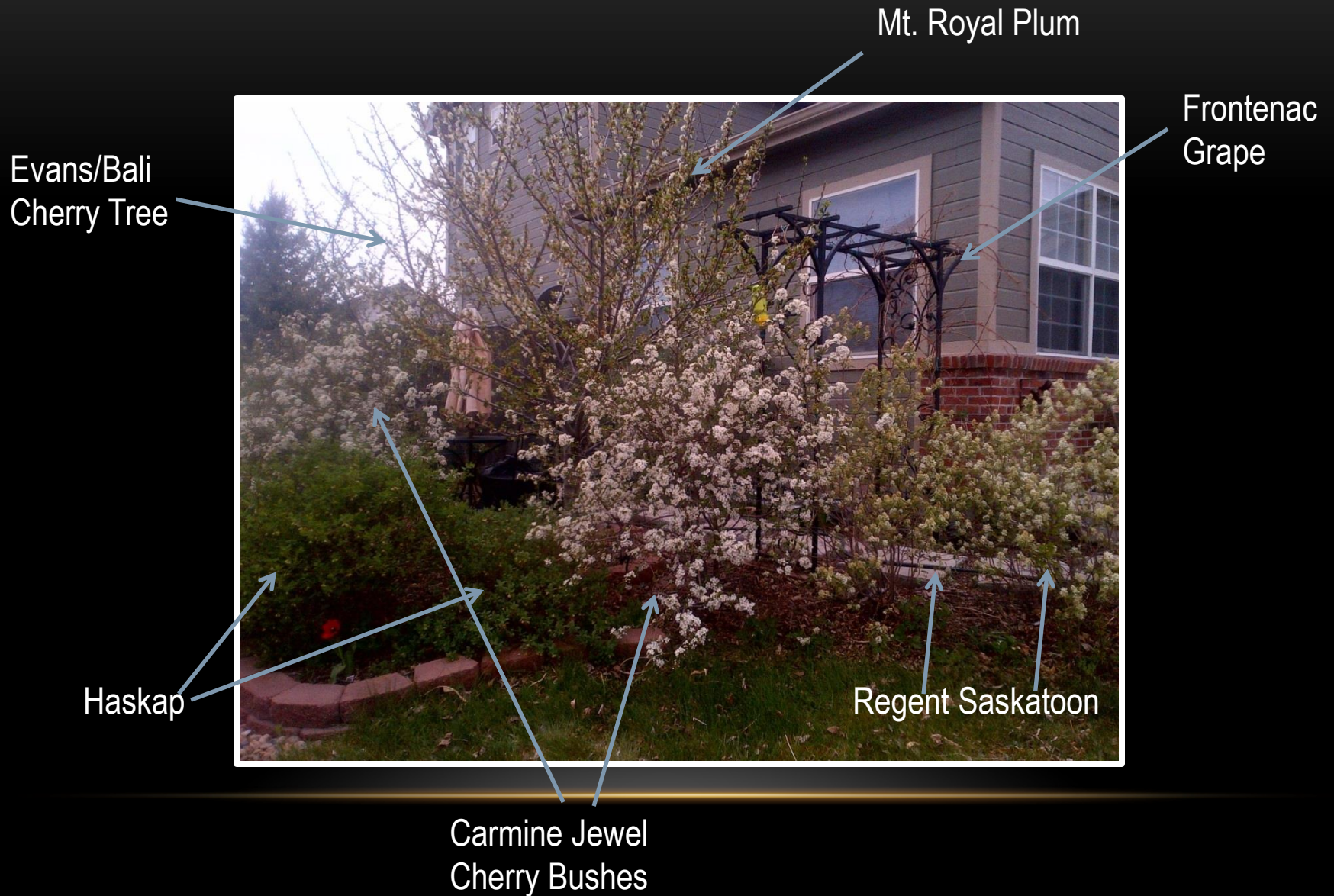


1 year after planting



6 years after planting

EDIBLE LANDSCAPE IN BLOOM



HIGH-END, PROTECTED, RAISED BED GARDEN & HERB WALL



CONTAINER GARDENING



EDIBLE LANDSCAPING



Pear Tree w/ Strawberries
Young Grapes in Background



Hardy Kiwi &
Mushroom Log

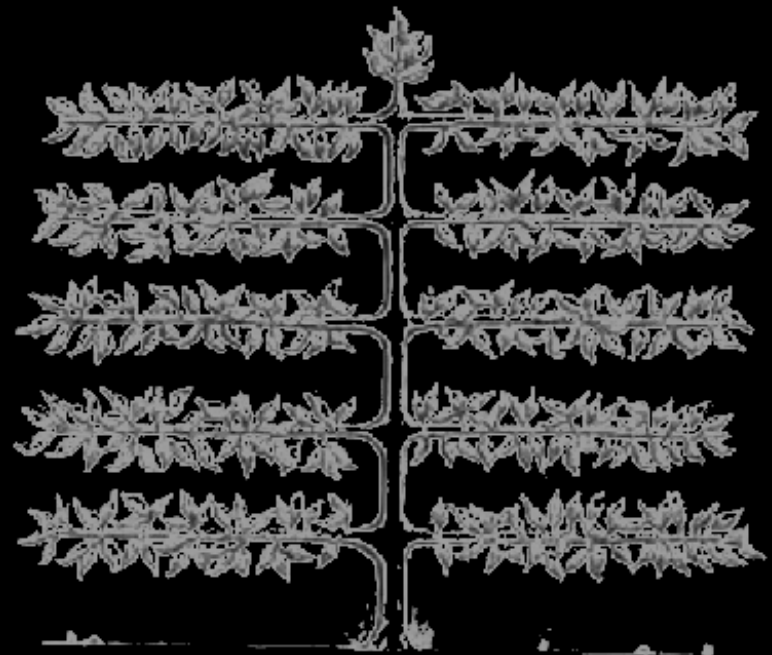


Hardy Seedless
Table Grape

ESPALIER: TRAINING INTO A SINGLE PLANE

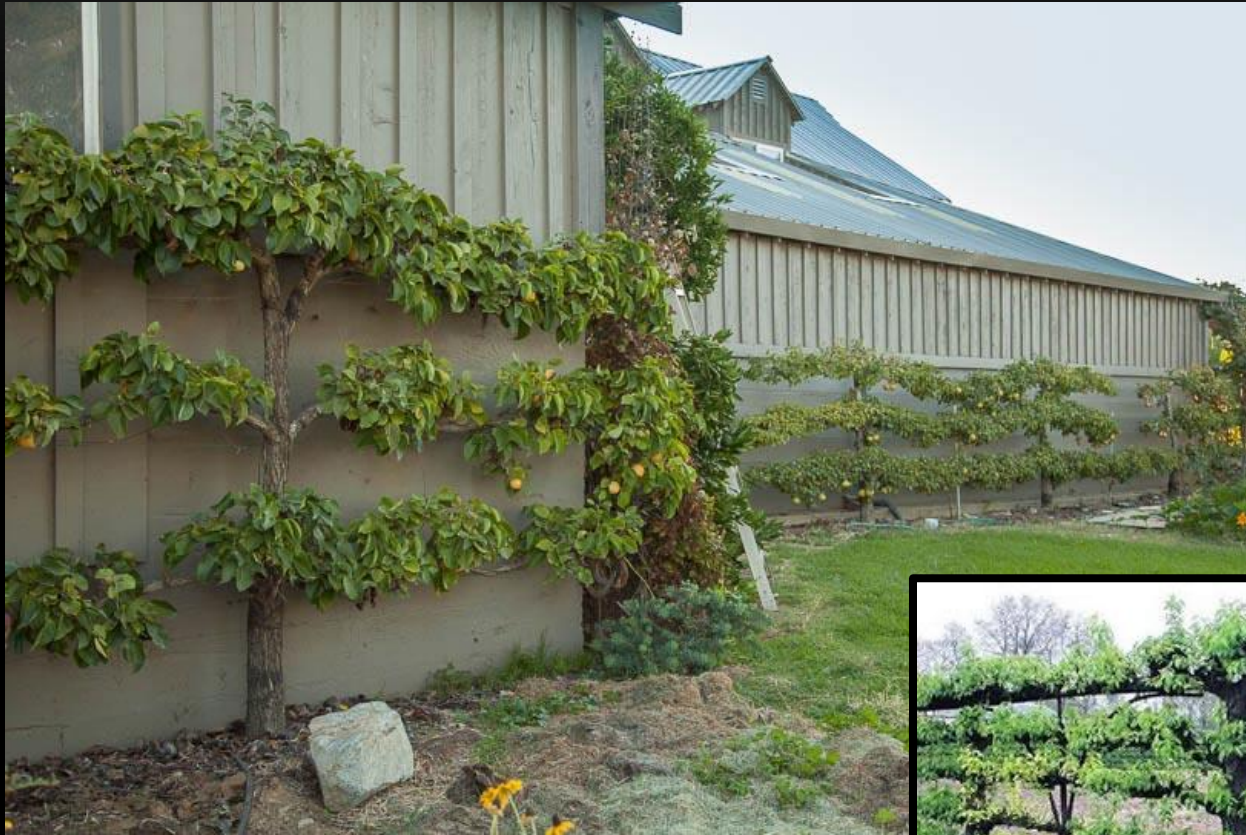


FAN



HORIZONTAL CORDON

ESPALIER—HORIZONTAL CORDON



ESPALIER—APPLE STEPOVER



ESPALIER—CORDON & BELGIAN FENCE



ESPALIER—ARCH & CANDELABRA



STRAWBERRY BED OPTIONS



RAISED BED OPTIONS



HERB/VEGETABLE WALL OPTIONS



INNOVATIVE TRELLISING & SQUARE-FOOT GARDENING



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NOTABLE INITIAL PERFORMANCE DOUGLAS COUNTY RESEARCH ORCHARDS

- **Good**

- Apple
- Primocane fruiting Raspberry
- Early Primocane fruiting Blackberry
- Strawberry
- Bush Cherry
- Tart Cherry
- Seaberry
- Currant
- Gooseberry
- Aronia
- Haskap

- **Poor**

- Pawpaw
- Groundcover raspberry
- Medlar
- Shipova
- Hardy Kiwi
- Cranberry
- Lingonberry
- Mulberry
- Quince
- Persimmon
- English Walnut
- Almond

PRESENTATION TOPICS

- Front Range Climate Parameters
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 - Front Range Fruit & Vegetable Growing Opportunities
 - Periodic Intense Freeze Expectations
 - Good & Poor Performance List
 - **Fruit Type & Variety Recommendations**
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HASKAP/HONEYBERRY (EDIBLE BLUE HONEYSUCKLE)

- Hardy to -40°F
- Blossoms hardy to $17-19^{\circ}\text{F}$ (tolerates spring frost)
- Native from N. Japan to Siberia +
Canada



IMPROVED CULTIVARS FOR OUR REGION

Univ. of Saskatchewan

- Boreal Blizzard
- Boreal Beauty
- Tundra
- Aurora
- Borealis
- Indigo Series (Treat, Gem, Yum)

Oregon State Univ./Dr. Maxine Thompson

- Solo-self pollinating
- Maxie-fairly large fruit



ROMANCE SERIES HARDY BUSH CHERRY

- Univ. of Saskatchewan
- 6.5-8' bush
- Complex tart flavor
- Yield up to 25lbs/bush
- Gorgeous plant in the landscape



CARMINE JEWEL IN BLOOM



Carmine Jewel
Cherry Bushes

MEADER SERIES HARDY BUSH CHERRIES

- ≥4' statured
- Smaller bush for landscapes
- Blooms & fruits later in summer
- 10 lb./plant yield potential
- Cross pollenate Joel & Jan with Joy
- Great fall color



Late Summer Fruit



Jan in Bloom



Joel in Bloom



Fall Color

SASKATOON (AKA SERVICEBERRY, JUNE BERRY)

- 4-16' bush or tree to 25'
- Great landscape plant
- 10-15 lbs./plant yield possible



SASKATOON/SERVICEBERRY



SASKATOON VARIETIES

- Amelanchier stolonifera
 - Fergie 5'
- Amelanchier alnifolia
 - Regent 4-6'
 - Park Hill 5-7' (12'?)
 - Lee #8 6-8'
 - Success 6-8'
 - Smoky 6-8' (15'?)
 - Lee#3 8-10'
 - Forestburg 8'
 - Nelson 5-8'
 - Honeywood 8-11'
- Martin 10'
- Bluff 10'
- Northline 6-8'
- Pembina 10'
- JB30 (10'?) 14-16'
- Thiessen 12-15'
- Amelanchier canadensis
 - Prince William 10'
 - Princess Diana 20'
 - Autumn Brilliance 20-25'

GOOSEBERRY & CURRANT

- Very cold tolerant
- Shade tolerant
- Espalier options
- High nutrition
- Various colors & flavors



Various colored gooseberries & hybrids from Hidden Mesa

GOOSEBERRY

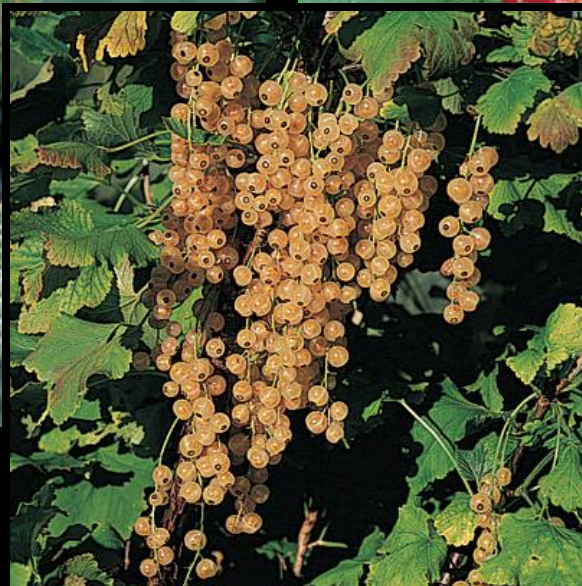


Picked 7 lbs. off 3
bushes in shaded
edible landscape
2012

VARIOUS RED GOOSEBERRIES FROM HIDDEN MESA



CURRANT



RED CURRANT ESPALIER



ELDERBERRY

- European (*Sambucus nigra*)
- American (*Sambucus canadensis*)
- Highly nutritious
- Process products (not for fresh eating)
- Yields:
 - 12-15 lbs/plant
 - 4-12 tons/ac in New York (more w/ *S. nigra*)
- Ornamental quality



SEABERRY

- \$330M industry in Europe & Scandinavia
- Hardy to -40°F
- Dioecious (Needs Male Pollinator)
- Super-fruit
- Late frosts can affect yields
- Suckers



ARONIA

- Aka: black chokeberry
- Well adapted to CO
- Very nutritious
- 2-4 tons/ac @ maturity
- Process market (Juice)
- Ornamental quality



RASPBERRY & BLACKBERRY



BRAMBLES

- Primocane (fall fruiting) varieties are best
- Floricanes overwinter poorly
 - Surprisingly, Black raspberry overwinters better than reds



BRAMBLE OVERWINTER MITIGATION OPTIONS

- Anti-desiccants
- High or low tunnels
- Row covers
- Laying canes down & mulching



PRIMOCANE BRAMBLE MANAGEMENT

- Usually managed for single fall crop in CO
- Bear on top 1/3 of 1st year canes in late Aug., Sept.+
- Mow canes off winter or spring



Mowing last season's primocanes in winter

BLACK RASPBERRIES RECOMMENDED CULTIVARS

Surviving Cultivars

- Bristol
- Mac Black (late variety)
- Jewel
- Munger
- Logan
- Niwot (primocane)
- Ohio Treasure (primocane)



Black
Raspberries
2013

2014 BLACK RASPBERRY COMPARISON



PRIMOCANE BLACKBERRIES

- All primocane BBs rushed by fall frosts
- Prime Jan earliest
- Prime Jim middle
- Others too late



TRADITIONAL BLACKBERRY CULTIVARS

- Triple Crown
- Chester
- Loch Ness

- Trailing
- Thornless
- Floricane Fruiting



Triple Crown berries 2014
Grown in High Tunnel

PRIMOCANE RASPBERRIES

All mature primocane varieties grow and fruit at Franktown & Castle Rock



PRIMOCANE RASPBERRY VARIETY CHARACTERISTICS

- Fall Gold: More flavorful & firmer than Anne, light yields
- Anne: Yellow, soft, light yields
- Jacklyn: Excellent flavor, fruit sticks to torus, slightly frost tender, moderate yields
- Himbo Top: Sunscald problems
- Caroline*: Exc. Flavor, highest vitamin C, high yield
- Polana*: A little more tart, 20% higher yield in Boulder**

*Best all around choices for Front Range Growing, based on current experience.

**Joel Reich, personal communication

PRIMOCANE RASPBERRY CHARACTERISTICS

- Autumn Britten*: Exc. Flavor, high yields
- Autumn Bliss*: Exc. Flavor, 50% of harvest in 1st couple weeks, minimizes loss to early frost, high yields
- Prelude
- Joan J
- Heritage: Good berry but 2-3 weeks later than others, risking frost, high yields, somewhat soft
- Plainsman: From Cheyenne Research Station (no data yet)

*Best all around choices for Front Range Growing, based on current experience.

FRUITS OF OUR LABOR



DAY NEUTRAL STRAWBERRIES WITH COMMERCIAL POTENTIAL

Varieties:

- Monterey
- Mara Des Bois
- Evie 2
- Albion
- Seascape
- Portola
- San Andreas



Strawberries grown at Hidden Mesa

GRAPES

- Can work on Front Range
 - Select Varieties:
 - Cold hardy
 - Early to mid-season ripening
 - Later bloom is best
 - Table Grapes
 - Wine/Juice Grapes
 - Avoid Vinifera (too tender)
-

SEEDLESS TABLE GRAPES

Himrod



Reliance



Harvested up to 15 lbs./vine Reliance

OTHER SUITABLE GRAPES

Table

- Canadice (seedless red)
- Glenora Black (seedless)
- Swenson red
- Swenson white
- Experimenting with others

Natives

- Concord
- Niagara

WINE GRAPES

Marechal Foch



Frontenac



Harvested 3-4 lbs./vine 2012
Partially shaded edible landscape



TREE-TYPE TART (PIE) CHERRIES

- Normally very reliable producers in Front Range Climate
 - Damaged in extreme freezes
- Susceptible to bird predation
- High yield potential
- Beautiful landscape tree
- Amarelle types (clear juice)
- Morello types (dark red juice)



Evans Bali tart cherry tree in edible landscape in Castle Rock

HAZELNUT



HAZELNUT/FILBERT

- Use hybrid bush varieties from:
 - Ontario
 - Minnesota



Catkins



Hazelnut Crop

HIGHBUSH CRANBERRY



- Viburnum not Vaccinium
- Beautiful in landscapes
- Cranberry flavor



GOJI/WOLFBERRY



- Zone 5-6 (possibly colder zones)
- Prefers alkaline to neutral soil
- Very nutrient dense fruit

MAYPOP PASSIONFRUIT



- Zone 5
- Dies to ground each year
- Gorgeous in landscape
- Does not often ripen fruit
- Blooms daily

OTHER UNIQUE EDIBLES



Rhubarb



Autumn Olive



Goumi



Princepia



Hops

APPLE VARIETIES

- Selected for:
 - Hardy to zone 5A minimum
 - Fireblight Resistance
 - Early to Mid-Season Ripening
 - Quality Fruit



PEARS

- Early Bloom may be problematic

Select Varieties that are:

- Hardy to Zone 5A minimum
- Fireblight (FB) Resistant
- Early to Midseason Ripening
- Good Fruit Quality



Honeysweet Pears grown
in Castle Rock

PLUMS

- Option on Front Range
- Select:
 - Cold hardy
 - Later blooming cultivars
 - European & prune plums later



Some of Mount Royal harvest 2012



Mount Royal plum in edible
landscape 2012

PEACHES

- Early bloom (lose fruit to frost sometimes)
- Use late/hardy bloom varieties
- Or protect blossoms from frost
- Gorgeous plant in the landscape!



FROST RESISTANT VARIETIES WORTH TRYING

- Contender
 - Intrepid
 - Carolina Gold
 - China Pearl
 - Reliance
 - Madison
 - Poly
 - Redhaven
 - Veteran
 - Raritan Rose
 - Harrow Diamond
 - Glohaven
 - Challenger
 - Nectar
 - Flamin' Fury PF 24C
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APRICOTS

- Early Bloom (losses frequent)
- Use late blooming/hardy bloom/long bloom varieties
- Frost protection methods helpful



PRESENTATION RECAP

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QUESTIONS??



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