

Great Lakes Fruit, Vegetable & Farm Market EXPO

December 9-11, 2008

DeVo Place Convention Center, Grand Rapids, MI



Brambles II

Tuesday afternoon 2:00 pm

Where: Grand Gallery (lower level) Room E-F

Recertification credits: 1 (1C, PRIV OR COMM CORE)

CCA Credits: CM(1.0)

Moderator: Nathan Milburn, Milburn Orchards, Elkton, MD

2:00 p.m. Grower Spotlight: Growing and Marketing Extraordinary Brambles in Southwest Michigan

- Chuck and Coco McCallum, Riverside, MI

2:30 p.m. Bramble Herbicides for Today and Tomorrow

- Bernard Zandstra, Horticulture Dept., MSU

2:50 p.m. "Berrying" the Aging Brain

- Jim Joseph, USDA-ARS, Boston

3:30 p.m. New Information on Where and When to Irrigate Raspberries

- Thomas Walters, Mount Vernon Research Station, Washington State Univ.
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The EXTRAORDINARY BERRY

Chuck and Coco McCallum, Riverside, MI

Introduction:

- 1) Vision Statement: To grow a healthy product that will enhance our Great Customers!
- 2) Mission Statement: To respect the earth and the beauty that surrounds our Bramble Garden

A) Location: Intersection of Riverside and Pier Roads, Riverside, Michigan
Approximately 2 miles from 196
Approximately 4 miles from I-94

B) Growing/production practices:

- Site Selection
- Varieties
 - Blackberries
 - Red Raspberries
- Irrigation
- Post and wire
- Pesticide/Herbicide
- Compost and fertilization
- Pruning
- Harvesting

C) Sales & Marketing:

- Brand/The Extraordinary Berries
- Wholesale/retail
- Strategy changes from 2007 to 2008
- Signs and billboards

D) Sales Table:

- Customer profile
- Customer input
- The allure of the farm production process

E) Future plans:

- Add additional u-pick selections
- Continue to expand and enhance the “farm experience/food chain.”

F) Q & A

Bramble Herbicides for Today and Tomorrow

Bernard Zandstra
Michigan State University

What are Brambles?

Caneberries Rosaceae (<u>Rubus</u> spp.)	Boysenberry
Raspberry (black, red)	Loganberry
Wild Raspberry	Dewberry
Blackberry	

EPA Crop Grouping 13 Berry

- Subgroup: 13A Caneberry
- Representative Crop: Any one raspberry or blackberry

Caneberry Growth Cycle

- 1. Summer bearing - harvest in July from 2nd year canes (floricanes).
- 2. Fall bearing – harvest late August-October from current year's canes (primocanes).

Weed Control Questions in Caneberries

- 1. Preemergence weed control in summer bearing canes.
- 2. PRE WC in mowed raspberries (Fall berries).
- 3. Postemergence weed control – directed or broadcast.
- 4. Fall (dormant) applications of PRE herbicides.
- 5. Control of perennials (Canada thistle, goldenrod, hosenettle, quackgrass).
- 6. Control of composite annuals (horseweed, fleabane, ragweed).
- 7. Weed control in year of planting.

Preemergence Herbicides Registered for Caneberry

Herbicide	Mode of Action	Solubility	Residual Life
Karmex (diuron)	PS II inhibitor	42 ppm	50-70 days
Princep (simazine)	PS II inhibitor	2	50-60 days
Sinbar (terbacil)	PS II inhibitor	710	60-90 days
Kerb (pronamide)	Mitosis inhibitor	15	40-60 days
Devrinol (napropamide)	Mitosis inhibitor	73	30-50 days
Surflan (oryzalin)	Mitosis inhibitor	3	20-40 days
Casoron (diclobenil)	Cellulose synthesis Inhibitor	20	60-90 days
Solicam (norflurazon)	Carotenoid synthesis Inhibitor	28	50-60 days

Postemergence Herbicides Registered for Caneberries

<u>Herbicide</u>	<u>PHI</u>
Roundup (glyphosate)	14 days
Gramoxone (paraquat)	None
Poast (sethoxydim)	30 days
Aim (carfentrazone)	15 days

Weed Control – Year of Planting

- 1. Set plants in April; apply **DEVINOL** or **SURFLAN**.
- 2. Apply **GALLERY** (isoxaben) after ½ inch rain settles the soil around plants.
- 3. Apply **POAST** over the row for grass control.
- 4. Apply **GRAMOXONE** or **ROUNDUP** as directed spray to control emerged weeds. Do not spray berry plants.

Preemergence Weed Control – Established Caneberry Plants

- Summer bearing:
- 1. Fall application – band on both sides of row: **PRINCEP + KERB** (for quackgrass) or **CASORON** (for annual and perennial broadleaves)
- 2. Use **SOLICAM** in Fall for nutsedge control.

Preemergence – Fall Bearing Raspberries

- 1. Mow plants in late fall; apply **PRINCEP, CASORON, KERB, SINBAR, or SOLICAM** before soil freezes; or
- 2. Mow plants in early spring: apply **KARMEX, KERB, PRINCEP, SINBAR, or SOLICAM** over the row.

Postemergence to Established Caneberries

- 1. Grass control: **POAST** over the top of row or directed to base of plants.
- 2. Broadleaves: **ROUNDUP, GRAMOXONE, or AIM** directed to soil on each side of row; do not spray crop plants; do not spray into row.

Potential New Herbicide Labels for Caneberries

- **CALLISTO** – PRE annual broadleaves
- **CHATEAU** – PRE annual broadleaves and grasses
- **PROWL H2O** – PRE annual grasses and broadleaves
- **(STINGER)** – POST composites

Specific Weed Problems

<u>Weed</u>	<u>Herbicide</u>
Quackgrass	Kerb, Sinbar, Poast
Canada Thistle	Sinbar, Roundup
Goldenrod	Roundup
Horseweed	Gallery, Sinbar, Roundup
Annual Grasses	Poast

Summary

- Effective season – long weed control in caneberries includes Fall, Spring, and Summer herbicide applications. Rotating herbicide and modes of action will improve long-term weed control and result in greater yield.

New Information on where and when to Irrigate Raspberries

Thomas Walters
Michael Particka

WSU-Mt Vernon NWREC



Caneberry (Willamette Valley)

Total Seasonal Evapotranspiration [in]	37.8
Peak Evapotranspiration Rate [in/day]	0.25
Maximum Allowable Depletion [percent]	50
Critical Moisture Deficit Period	Primocane growth and Fruiting

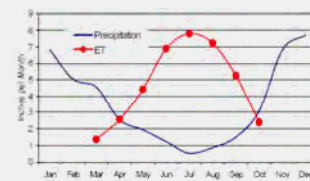


Figure 1. Typical precipitation and caneberry evapotranspiration (ET) in the Willamette Valley. Tabulated values of ET are provided on the back of this chart.

<http://biosys.bre.orst.edu/bre/docs/caneberr.pdf>

Raspberry Irrigation requirement

- In Mount Vernon WA, the peak irrigation requirement for caneberries is 1.5 acre-inches of water per week (40,731 gallons/Acre).
- Because of system inefficiencies, you will have to apply more to get that water to the plants.
 - Drip systems, up to 90% efficiency. Apply up to 1.7 inches per week (45,257 gal/A)
 - Big gun systems, about 50% efficiency. Apply up to 3 inches per week (81,462 gal/A)

Irrigation deficits

- Grower experience suggests irrigation needed for optimal yield, growth
- How much of a deficit will these crops tolerate?
- What times are critical for irrigation?

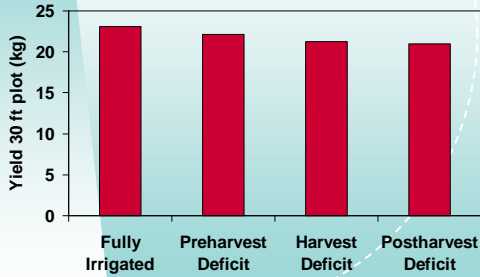
Raspberry Irrigation Deficit Evaluations at WSU-Vancouver REC

- Raspberry var. Meeker (3 ft effective rooting depth)
- Four treatments
 - Fully irrigated entire season
 - Preharvest irrigation deficit
 - Harvest period irrigation deficit
 - Postharvest irrigation deficit

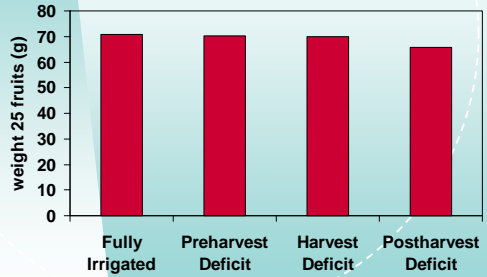
2006 Irrigation deficits

- Fully Irrigated Plots Irrigated to 100% ET
- Deficit plots Irrigated to 50% ET less rainfall
- Moderate, transient water stress

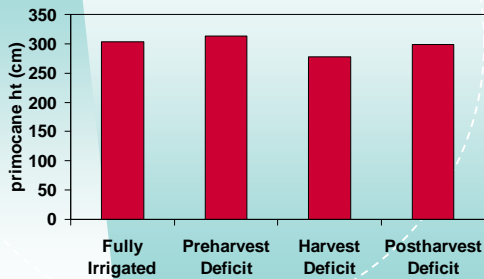
Raspberry Yields, Vancouver WA 2006



Raspberry fruit size, Vancouver WA 2006



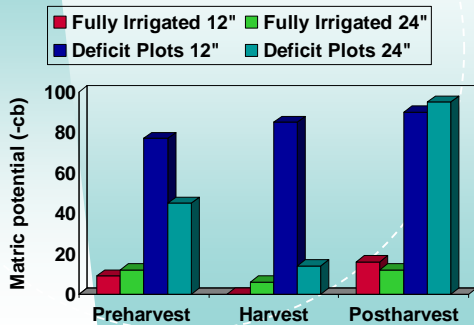
Raspberry primocane height, Vancouver WA 2006



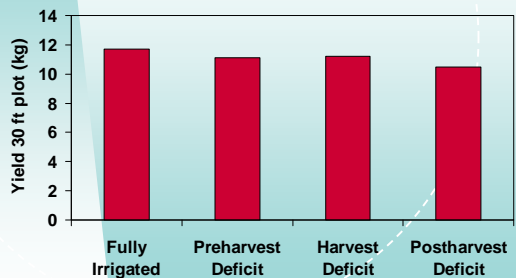
2007 Irrigation deficits

- Fully Irrigated Plots Irrigated to 100% ET
- Deficit plots Irrigated only once soil moisture became extremely low (in effect, this meant they were almost never irrigated)
- Moderate to severe transient water stress

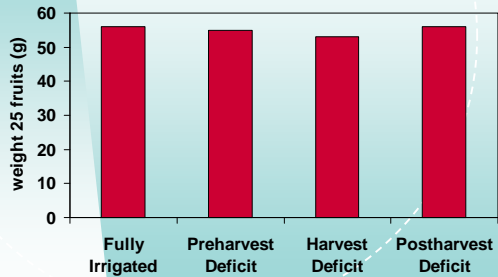
Tensiometer readings in Raspberry plots at end of 2007 deficit periods



Raspberry Yields, Vancouver WA 2007



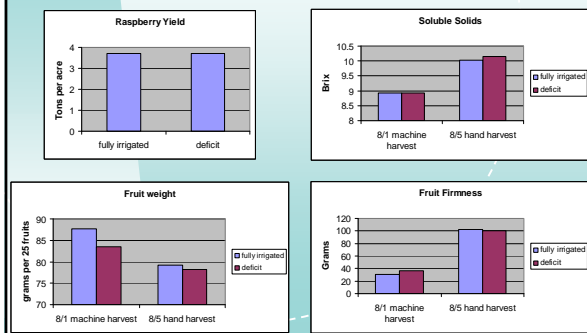
Raspberry fruit size, Vancouver WA 2007



2008 Irrigation deficits

- Fully Irrigated Plots Irrigated to 100% ET
- Deficit plots Irrigated to 50% ET
- Moderate transient water stress

Fully irrigated vs. deficit irrigated, Mount Vernon WA 2008



Conclusions

- Transient water stress did not affect raspberry
 - yields,
 - cane production
 - fruit size
 - Soluble solids
 - firmness

Raspberry root rot

- Commonly caused in NW WA by *Phytophthora rubi* (Formerly *P. fragariae* var. *rubi*)
- *Phytophthora* spp. generally reproduce rapidly in wet soils.
- Irrigation practices affect *Phytophthora* disease development in other crops.



Raspberry root rot

- Hilling improves drainage near the crown and helps manage raspberry root rot.
- Could drip line placement help as well?



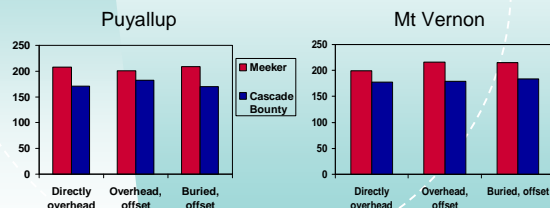
Raspberry Drip line Placement Evaluations

- Varieties
 - Cascade Bounty (resistant)
 - Meeker (moderately resistant)
- Drip Placements
 - Overhead, above crown
 - Overhead, offset
 - Buried, offset
- Locations
 - WSU-Puyallup (heavy pressure)
 - WSU-Mt Vernon (light pressure)

Drip line placements



2006 cane height (cm)

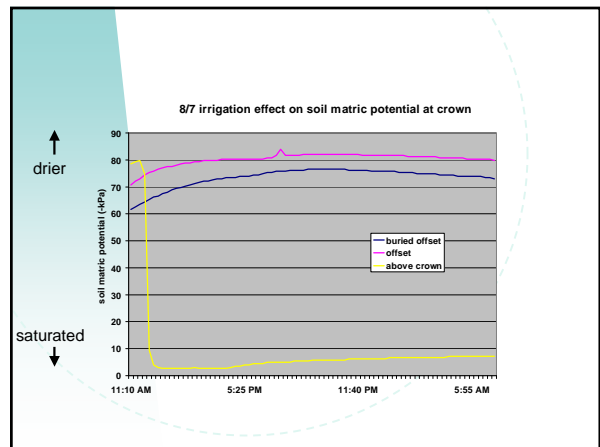
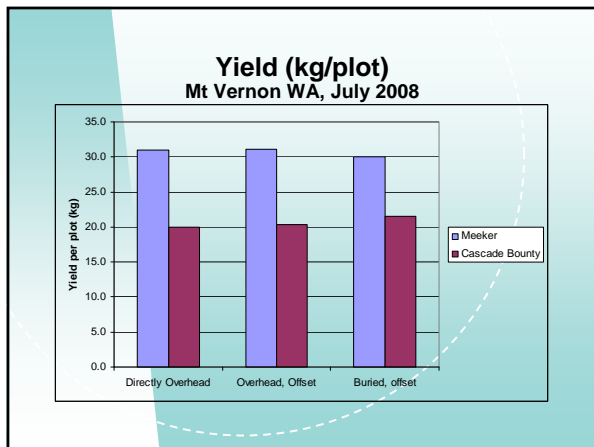
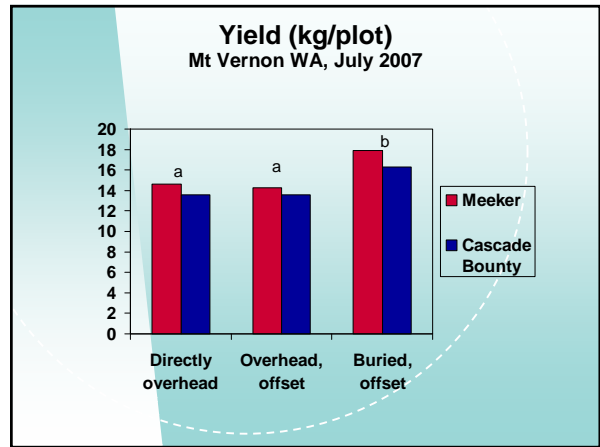
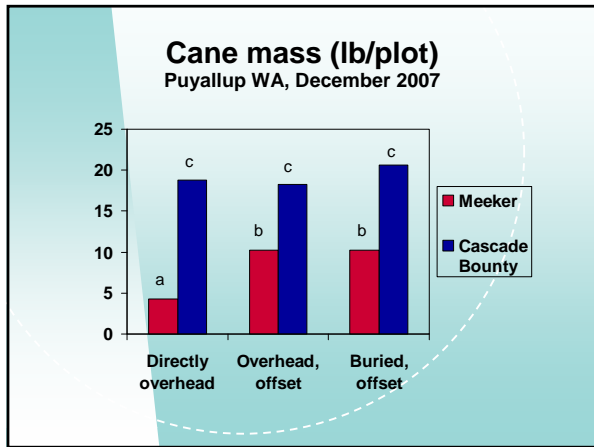
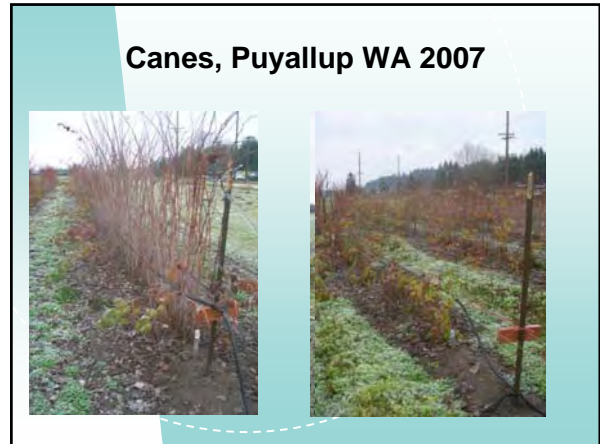
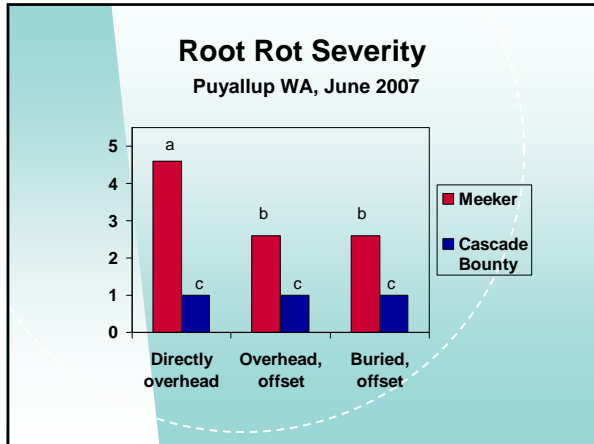


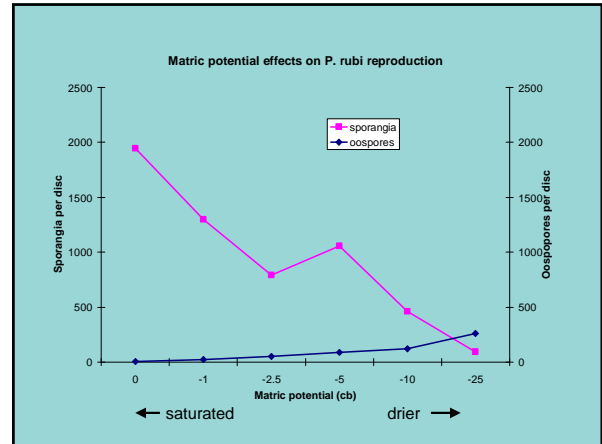
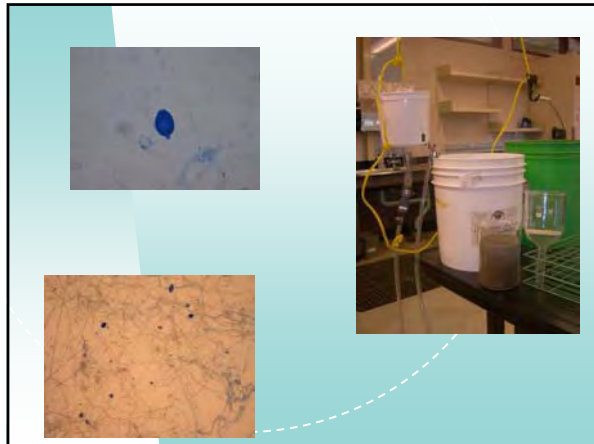
2007: Cascade Bounty-no root rot symptoms



2007: Meeker root rot symptom severity depends on drip placement







Conclusions

- Cascade Bounty was resistant to *Phytophthora* root rot.
- Under conditions of high root rot pressure, placing drip lines 5-6 inches away from the crowns slowed root rot development in Meeker.
- Under conditions of low root rot pressure, drip line placement did not have large effects on yield.
- Soil under drip lines remained saturated. This condition was favorable to sporangia production by *Phytophthora rubi*.

Acknowledgements

The Check Writers

- Washington Red Raspberry Commission
- Washington State Commission on Pesticide Registration

The Crew

- Mindy and Brianna Moulton
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