


Sustainable Blackberry Production

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Sustainable Agriculture

agriculture that will last...indefinitely

- ❖ must be ecologically sound
 - natural system is the source for basic resources and sink for our wastes
- ❖ economically viable
 - farm families must be able to survive financially
- ❖ socially responsible
 - relationships, values, connections with community

Nutrient Management

Based on soil analysis

Established planting - 60 to 80 lb N/acre

Berries need K

Build up soil K before planting; apply equal amt N:K

Soil testing (biennially) & Foliar testing (yearly)

Nutrient sources - source locally, if possible

compost

animal-based pelletized fertilizers

Plant-based protein fertilizers

liquid fish emulsion

Key Pests

- ❖ Weeds
- ❖ Insects: Redneck Cane Borer, Raspberry Crown Borer, Japanese Beetle, Strawberry Bud Weevil
- ❖ Diseases: anthracnose, phytophthora, rosette, orange rust

Weeds

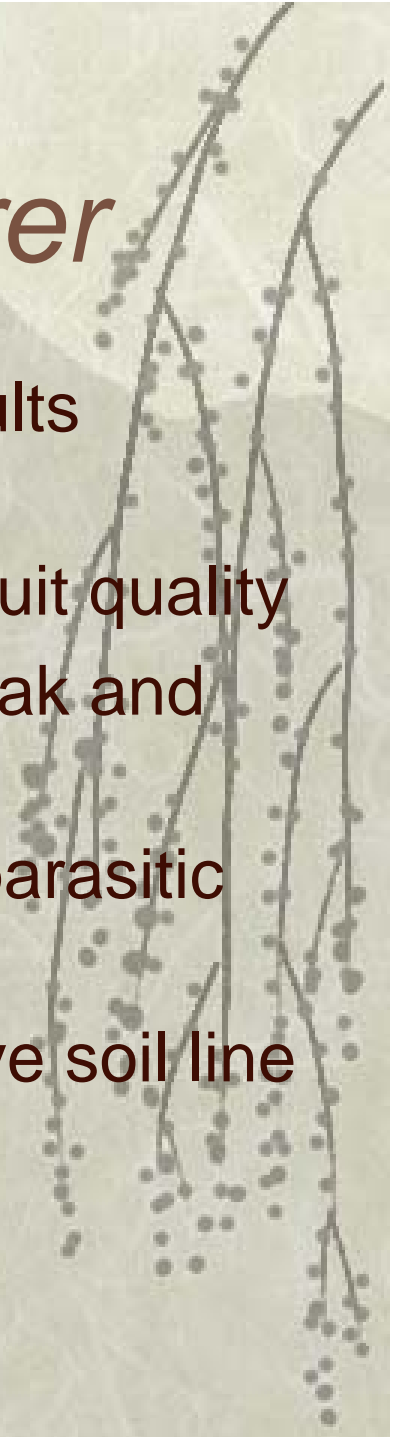


- ❖ Most Important - eliminate noxious weeds (burmuda, johnson grasses) before planting - may take a year before planting
- ❖ Wood chip mulch - Promote healthy soil ecosystem
- ❖ Cultivation
- ❖ Geotextile fabric mulch - primocane mgt
- ❖ Plant non-aggressive groundcover - eg fescue



Redneck cane borer

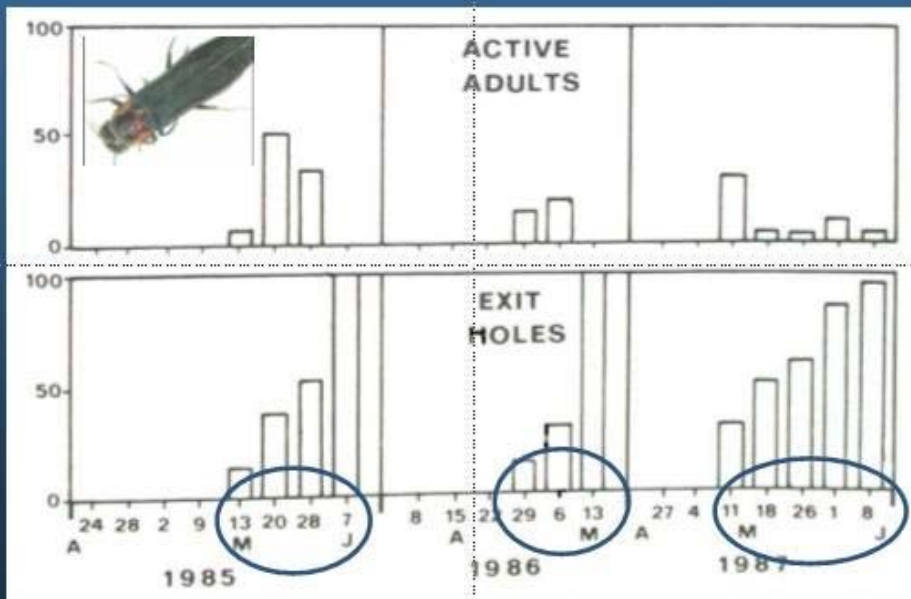
- eggs laid early May - early June- look for adults feeding on foliage
- causes weak canes, winter injury and poor fruit quality
- scout for galls in early spring, before bud break and prune out affected canes and burn/destroy
- up to 75% natural mortality: fungi, weather, parasitic wasps.
- bores into cane & forms a gall from 0-2' above soil line
- insecticide app, pyrethrum, neem after bloom
May/June, at dark; Admire Pro



1 Year Life Cycle in Arkansas



Rednecked cane borer



▪ Adults emerge = 29 April to 8 June

*Midwest Commercial
Small Fruit and
Grape Spray
Guide 2008,*

www.hort.purdue.edu/hort/ext/sfg/

Raspberry crown borer

- ❖ in mid-Sept thru Oct, eggs laid on underside of new terminal leaves - hatch 40-60d later
- ❖ larvae hatch and walk down cane to soil; bore into cane to overwinter;
- ❖ next spring it feeds on crown until fully developed (July, Aug) and emerges, then pupates
- ❖ resulting in weak, thin canes. tip wilting and dieback
- ❖ nematodes *Steinernema feltiae*, & *Heterorhabditis bacteriophora* -applied as a soil drench, **early April**
- ❖ natural parasitoid wasps
- ❖ chem: Capture or Brigade as soil drench



raspberry crown borer,
mimics yellow jacket

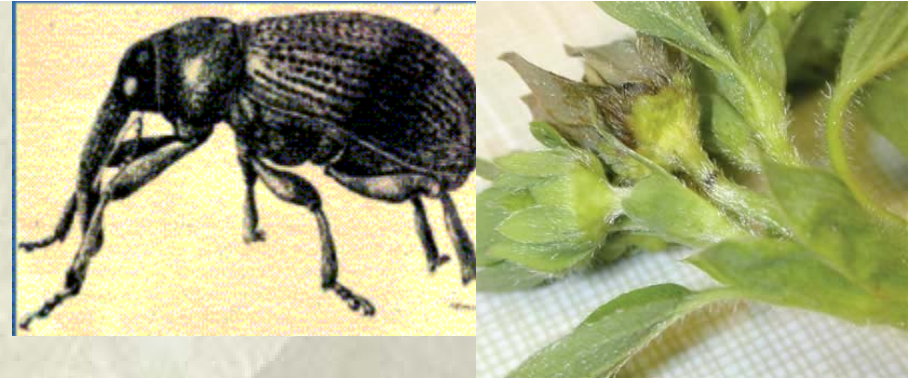


Japanese Beetle



- ❖ trap out - put around perimeter
- ❖ *Bacillus popilliae* - Milky spore
- ❖ entomopathogenic nematodes; attack grub
- ❖ parasitic wasps - not commerc. available; food source for these wasps is aphid nectar
- ❖ Surround
- ❖ Pyrethrum
- ❖ Neem

Strawberry Bud Weevil



- ❖ Adults enter blackberry plantings after Redbud trees and strawberries have bloomed, mid-April; Look for SBW when first blossoms open
- ❖ Female SBW lays an egg into an unopened flower bud; then severs the bud from the pedicel, causing it to hang or fall to the ground, preventing fruit formation.
- ❖ Larvae develop in the severed buds and reach maturity in 3-4 weeks.
- ❖ Adults emerge in June, feed on flower pollen, then enters aestivation
- ❖ In fall, adults find resting sites and remain inactive until spring.
- ❖ Overwintering adults emerge from ground litter commonly of wooded areas and migrate to strawberry and Redbud trees.
- ❖ Plantings should be located away from overwintering sites. Later-fruiting varieties less likely to be attacked.
- ❖ Brigade, Capture, and Sevin can be applied for control of this insect.



Disease

- ❖ Plant disease resistant varieties
- ❖ UA varieties resistant to many diseases
 - Anthracnose, rosette, orange rust
- ❖ Anthracnose - lime-sulfur, delayed dormant
- ❖ Phytophthora - site selection and soil conditions; raised beds for drainage, mulch, if needed

Diseases

- ❖ Rosette/Double Blossom - cv selection; mow planting before flowering to elim spore release; chem control minimally effective under high pressure;
- ❖ Orange Rust - spore germ slow at 77F+; infection spring, fall;
- ❖ few fungicides registered for brambles



rosette or
roundup??



Disease Susceptibility

	Rosette	Orange Rust	Anthracnose
Apache	R	R?	R
Arapahoe	R	R?	R
Chickasaw	S	R	some resistance
Kiowa		R	some resistance
Navaho	R	S	R
Ouachita	R	R	R
Shawnee	S	R	R
Prime Jim	none on primocanes	R	some resistance
Prime Jan	none on primocanes	R	some resistance

Blackberry Diagnostic Tool

- ❖ www.ncsu.edu/project/berries/diagnostic_tool/blackberry_diagnostic_tool.html
- ❖ Gina Fernandez, NCSU
- ❖ Pictures of common foliar, cane, fruit probs



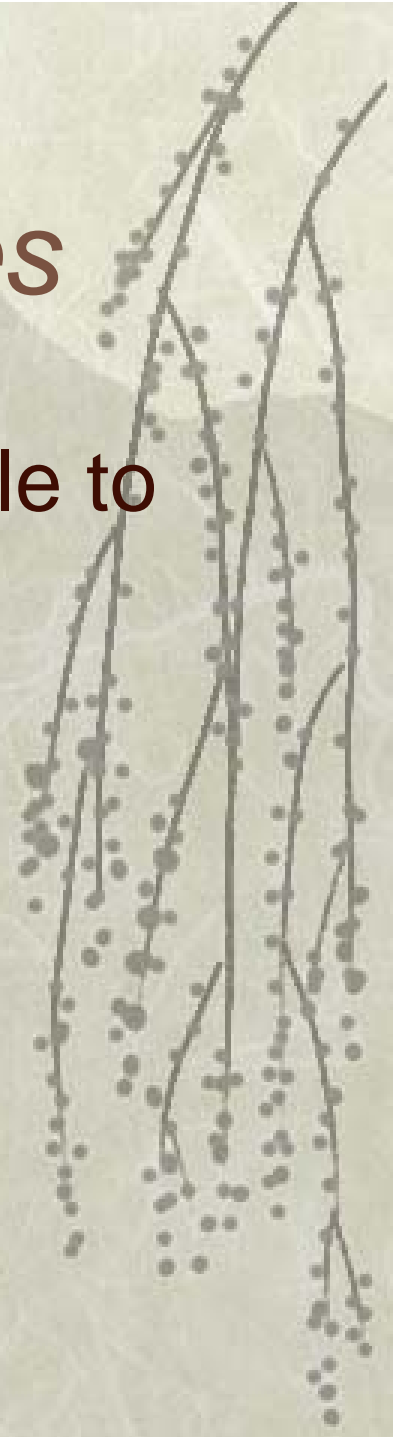
Cultural Practices for Disease Mgt

- ❖ disease resistant cv & virus-free plants
- ❖ promote air flow - manage canes/ft²; avoid shady places or woody areas - inhib air flow
- ❖ avoid over fertilization - promote excessive foliar growth
- ❖ keep weeds out
- ❖ don't prune wet leaves
- ❖ remove inoculum - pruned material
- ❖ don't plant near wild brambles or remove them
- ❖ soil diseases - know land history; test soil; build OM

Minimize Plant Stresses

- ❖ stressed plants are more vulnerable to diseases & insect attack
- ❖ are less productive

- ❖ well watered; irrigate a must
- ❖ optimal fertilization
- ❖ control weeds



Fruit Quality

- ❖ harvest often - harvest before over-ripe
 - avoid putting fruit of differing ripeness into same container
- ❖ don't touch berries until ready to harvest
- ❖ pick in a.m. during summer; fruits soften in heat
- ❖ Don't pick in rain, if possible
- ❖ remove field heat asap
- ❖ minimize handling - pick directly into salable container; field sore
- ❖ store at 32F

Good Agricultural Practices

- ❖ avoid use of raw manures - thoroughly composted or apply 120d before harvest
- ❖ clean water (free of microorgs, debris, contaminants) for irrigation, cleaning, processing
- ❖ high sanitation standards & good hygiene practices
- ❖ Develop Food Safety Plan for your operation

Food Safety Plan

1. List steps from preparation for planting to post harvest handling
2. Identify steps/areas that may affect product quality or safety
3. Identify how you can monitor or measure the risk.
4. Modify practices to reduce or eliminate risk
5. Documentation

Ron Rainey: GAP workshop for growers Feb 1, Little Rock

Summary

- ❖ **Sustainable production is more a “strategy” than a “sum of operations”**
- ❖ **Such a strategy should start by choosing resistant varieties adapted to the local environment**
- ❖ **Avoid plant stresses - irrigation mgt, planting density, nutrient management and pest management**
- ❖ **Ground cover management is useful against weeds and may also influence soil quality and supply some nutrients.**
- ❖ **For Pest and Disease control, start with cultural, biological and mechanical methods then pesticides**
- ❖ **Know potential sources of contamination**