

Spotted Wing Drosophila Netting Exclusion Production Systems. Does it Work For Pick-Your-Own Operations?



Peter Jentsch

2019 NEVFC

December 12th,

DoubleTree Hotel - Manchester, NH



Cornell University

Hudson Valley Research Laboratory

THE JENTSCH LAB

INSECT BIOLOGY, ECOLOGY, AND MANAGEMENT IN HUDSON VALLEY AGRICULTURAL COMMODITIES



WELCOME **ENTOMOLOGY** BROWN MARMORATED STINK BUG INVASIVES ORGANIC AG. RESEARCH TREE FRUIT THE HEIRLOOM ORCHARD
VEGETABLE SWEET CORN SMALL FRUIT GRAPE IN THE NEWS

Plant Protection Presentations

Welcome to the Jentsch Lab



HVRL ENTOMOLOGY STAFF

Research Our research and extension outreach program is directed by [Cornell University's Department of Entomology](#) and located at the [Hudson Valley Research Laboratory \(now FARM\)](#), in Highland, NY. We are a part of the [New York State Agricultural Experiment Station in Geneva, NY](#), with the laboratory building owned by a non-profit cooperative tree fruit grower organization (HVRL Inc.).

Partnership This cooperative partnership with the [College of Agriculture and Life Science \(CALS\)](#), [Cornell Cooperative Extension \(CCE\)](#) and the [Eastern New York Commercial Horticultural Program \(ENYCHP\)](#) providing continuous agricultural



Search

2017 BLOG PAGES

- Last Chance To Sign Up: The Heirloom Orchard: A Three-Day Series on Estate Orchard Management. Saturday Dec 8th, 15th, 22nd 2018. 5:00-8:00 pm HVRL 3357 Rt. 9W, Highland NY 12528 December 6, 2018
- The Heirloom Orchard: A Three-Day Series on Estate Orchard Management. Saturday Dec 8th, 15th, 22nd 2018. 5:00-8:00 pm HVRL 3357 Rt. 9W, Highland NY 12528 December 6, 2018

Research and Extension to the agricultural community on Tree Fruits and Vegetables in the Hudson Valley since 1923.


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Plant Protection Presentations

Fruit Production IPM Presentations:

2019

Developing Cultural Strategies To Manage Spotted Wing Drosophila In Blueberry Production Systems. 2019 NEVFC December 12th, DoubleTree Hotel – Manchester, NH

Do Exclusion Systems For Raspberry Production Systems Work???. 2019 NEVFC December 11th, DoubleTree Hotel – Manchester, NH

[Growing Fruit Trees On A Diversified Farm-Orchard Planning & Management. 2019 Young Farmers Conference, Stone Barns Ctr. for Food & Ag., Tarrytown, NY](#)

*Additional Resources:

[Cider school. Apple for use in making cider](#)



2017 BLOG PAGES

- [HVRL / Cornell AgriTech In The Spotlight: 2019 Hudson Valley Orchard Donations to the Regional Food Bank of Northeastern NY](#) November 25, 2019
- [Factors Contributing To The 2019 Hudson Valley Insect Pest Management Anomalies](#) October 21, 2019
- [First Fruits: Supporting the Hudson Valley Regional Food Bank and the](#)

SWD Exclusion System: Goals

- Design low cost structure to support exclusion net
- Use high tensile wire, recycled posts, trellis system components
- Design a dynamic structure to withstand moderate wind conditions
- Provide a comfortable and aesthetic PYO experience
- Organic / no spray management to maintain sound fruit
- Net: Reduce infestation of SWD from wooded borders
- Net: Reduce chemical inputs (Organic / 'No-Spray')



SWD Exclusion System: Goals

- 'Rain resistant' covering to reduces relative humidity
- Reduce weed presence using grass/weed free mat ($< rH$)
- Maintain pollination & fruit set: Natupol Bumblebee Hive
- Utilize Attract and Kill for SWD management
- Reduced Bird Feeding:
 - Allow for bird evacuation
 - Open at ends



Poughkeepsie Farm Project

Exclusion Net Project – Organic / No Pesticides



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Poughkeepsie Farm Project

Exclusion Net Project



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Exclusion Net Under 35 mph Winds



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SWD Exclusion Frame

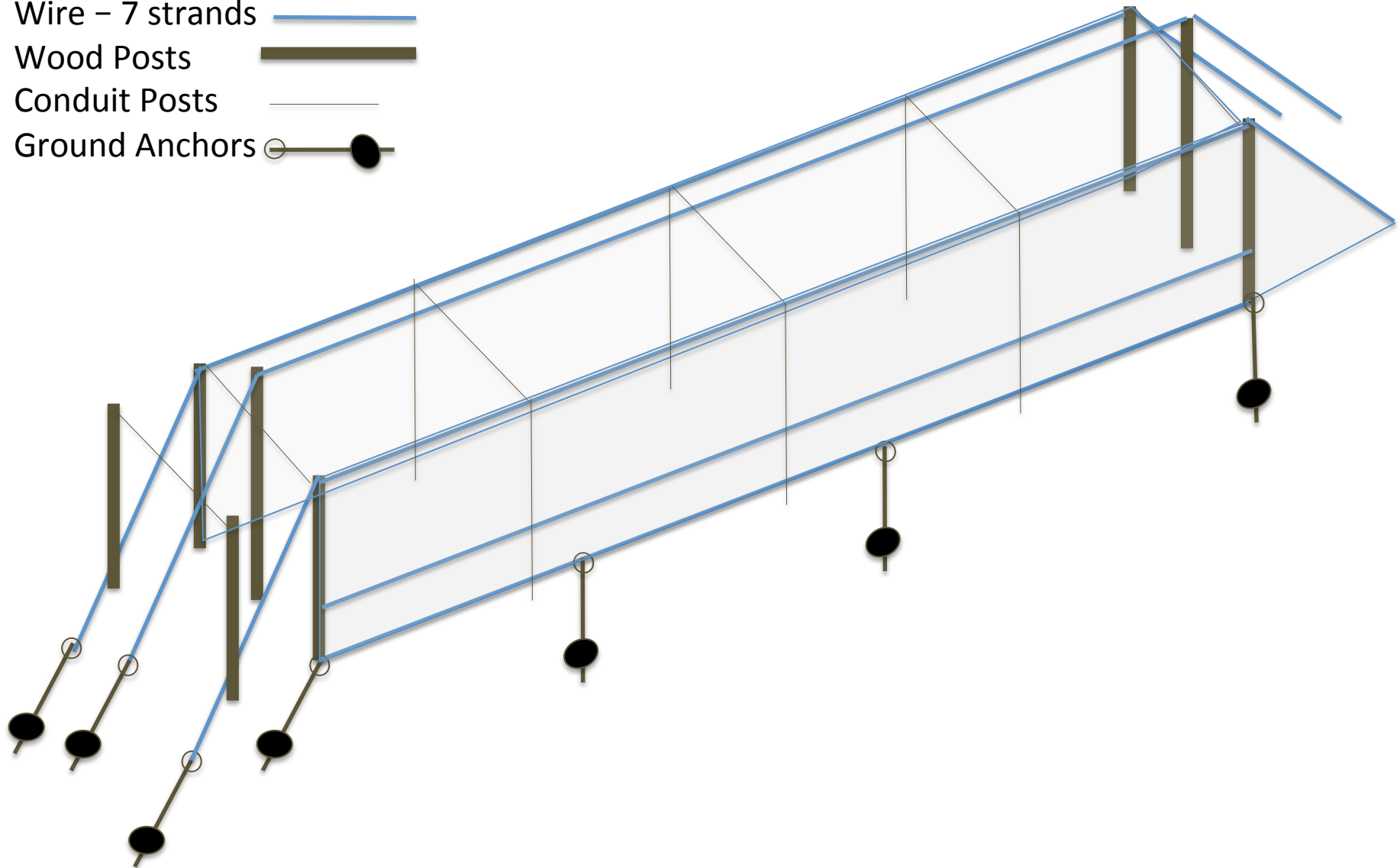
Materials

Wire – 7 strands

Wood Posts

Conduit Posts

Ground Anchors



Steps in Building PYO Berry Production Exclusion System

Material/ Procedure

1. Lay down 6' Woven Weed Barrier Mat
2. Drill and place 4" square and 8" round trellis posts and 4' & 30" ground anchors
3. Spin Jenny / high tensile trellis wire for 7 strands (2 anchored ground wires, 2 fold attach wires @ 18"; 2 side wires @ 6', 1 center wire @ 7')
4. Attach wire to posts & anchors, , Gripple & Cam wire for tension





Material/ Procedure

- Roll out 220' of Exclude Net
80 gram insect netting (.
95mmx .95 mm)
Manufactured by Tek-Knit
Industries, Montreal.
- Net over base wire and up
to 2nd 18" base wire
- Binder clips / 1" split tubing
overlap net at base.
- Clean lines



Exclusion Steps in Building PYO Berry Production System



- 8' Conduit driven into the ground along edge of net at 30' intervals with 90° grooved elbows to support form and walkway width







Exclusion Steps in Building PYO Berry Production System



- Structure ends with double sets of 'cooler door' panels for easy entry.



Bumble Bee Pollination Services in PYO



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Exclusion Netting for SWD

Steps in Building PYO Berry Production System

| | | | |
|--|---|------------|------------|
| SWD Exclusion / ATK System Costs of 1/10 th A. | 200' row netted 20' wide 6.5' high at center and sides | | |
| | Costs | Quantity | Costs |
| 8' Posts | \$9.80 | 6 | \$58.80 |
| Netting | \$732 | 5200sq.ft. | \$732.00 |
| High Tensile Wire | 4000'/\$90.00 | 1800 | \$40.50 |
| 30" Ground Anchors | \$6.00 | 10 | \$60.00 |
| 4' Ground Anchors | \$10.00 | 6 | \$60.00 |
| Bushings | \$0.01 | 4 | \$0.04 |
| Zip Ties | \$0.03 | 100 | \$3.00 |
| Ground Cloth | \$0.67 | 3600sq ft. | \$240.00 |
| Ground Cloth 6" Staples | \$0.11 | 120 | \$13.20 |
| Ratchet tensioners | \$4.50 | 6 | \$27.00 |
| Grippler Tensioners | \$1.50 | 12 | \$18.00 |
| End Post Cams | \$2.18 | 4 | \$8.70 |
| Tubing | \$0.23 | 10 | \$2.29 |
| Binder Clips | \$0.11 | 200 | \$22.22 |
| 4' Ground Conduit | \$0.75 | 6 | \$4.50 |
| 10' Net Support Conduit | \$1.75 | 10 | \$17.50 |
| 10' Post Separator Conduit | \$1.75 | 2 | \$3.50 |
| 90 plumbing elbows | \$0.6 | 6 | \$3.60 |
| Sandbags | \$0.50 | 90 | \$44.70 |
| Total material & labor costs | | | \$1,359.55 |

- 200' Exclusion system - Raspberry
- Initial Cost < \$1400.00
- Additional Costs:
 - Natupol Bumblebee Hives
(*Bombus impatiens*) \$230.00
 - Conduit cross members
& 1.5" poly tubing \$70.00.
 - Total cost \$1707.00 w/o labor



Summary: SWD Exclusion Net

- Exclusion net excludes beneficial insects (agumentation)
- Exclusion net in 'Pick-Your-Own' production requires adequate spacing to accommodate customer experience
- Net provides comfortable environment / temperature
- Pollination / Bumble bees interferes with PYO clients
- Open ends allows high SWD infestations, infestation levels of 100% in September (2018)
- Single access & double rows of entry panels reduces infestation < 10% with Attract and Kill Stations (2019)





Summary: SWD Exclusion Net



- Costs for 200' row netted 20' wide 6.5' high at center and sides = \$1707.00 ($\$854.00 / 100'$).
- Net longevity approximately 7 years ($\$244.00 / \text{year}$)
- Attract and Kill to manage SWD in exclusion net systems increase costs to $\$58.00 / 100'$
- Red raspberries yield up to 4,000 pounds/acre; 60-70 pints of fruits can be harvested from 100 feet row .
- PYO red raspberries sold for \$3.75 per pound ($\$3.15/\text{pint}$) provides \$15,000 / A or $\$500 / 200'$ exclusion (2017)





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| | |
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