**RACHEL E. RUDOLPH**

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CURRENT POSITION

Assistant Extension Professor, Vegetable Specialist Appointed March 1, 2018

Department of Horticulture, University of Kentucky

Distribution of Effort: 70% Extension, 25% Research, 5% Service

EDUCATION

Ph.D., Washington State University, Horticulture (2017)

M.S., New Mexico State University, Plant & Environmental Sciences (2014)

B.S., University of Nebraska-Lincoln, Environmental Studies (2007)

EXTENSION PROGRAMMING

FEATURED PROGRAMS

*Experiential high tunnel training for agents and growers.* 2019-2021. Program includes presentations, field days, and hands-on workshops across the state. This also includes an externally funded (see Extramural Funding) series of workshops specifically for county extension agents focused exclusively on all aspects of high tunnel systems. It also includes publications and tools that agents can use in the future to assist growers.

*Specialty crop webinar series.* 2019-present. This program started in September 2019. Each month a different webinar series (2-3 webinars/month) is offered to county agents and growers that focuses on a different topic that has been frequently requested by county agents across the state. Topics include: Strawberry Production (Sept.), High Tunnel Production (Oct.), Tomato Production (Nov.), and Pumpkin Production (Dec.).

*Abiotic disorders of tomato.* Program includes presentations for agents and growers across the state with a focus on preventing and managing abiotic disorders as well as dispelling misconceptions and myths surrounding abiotic disorders.

PROJECTS/TRIALS

*On-farm tomato grafting trial for management of root-knot nematode in high tunnels.* 2019. Evaluating three different tomato rootstocks and one non-grafted rootstock for management of root-knot nematode in a commercial high tunnel in Knox County. The information gained in this trial assisted with the development of a grant proposal that was funded (see Extramural Funding). It will also inform a future Master’s thesis project.

*On-farm tomato grafting trial for improved plant vigor in greenhouses.* 2019. Evaluating three different tomato rootstocks for improved vigor in a greenhouse (soilless production) in Laurel County.

*High tunnel broccoli cultivar trial.* 2019. This trial is evaluating 9 different broccoli cultivars for fall production in high tunnel as well as cold-hardiness.

*High tunnel ground cherry cultivar trial.* 2018-2019. This was a two-year trial evaluating the growth habit, management, and yield of a virtually unknown niche crop in Kentucky.

*High tunnel table beet cultivar trial.* 2019. Evaluating 9 different table beet cultivars for late winter, early spring production. Cultivars were evaluated for root size, quality, yield, and top quality.

*High tunnel summer squash and zucchini cultivar trial.* 2018. Evaluating 7 new cultivars of summer squash and zucchini for yield and fruit quality. Production in a high tunnel was compared to similar production in an open field system.

*Effect of plastic mulch color on aphid populations and virus incidence in summer squash*. 2018-2019. This project was a collaboration with Drs. Bessin and Pfeufer in Entomology and Plant Pathology, respectively. A peer-reviewed manuscript is in preparation.

*Multi-state radish cultivar trial.* 2018. A collaboration between KY, TN, NC, SC, LA, and AR. The primary objective was to observe the performance of each of the 16 cultivars in the trial across different locations and environmental conditions. Radish was chosen because cultivar trials on minor crops are not conducted on a regular basis because of a lack of funding and limited acreage planted in each state.

STATE AND COUNTY PRESENTATIONS/OUTREACH *(2,500 clientele reached)*

I have delivered **61 presentations** at county meetings, agent trainings, and field days since March 1, 2018. Through these efforts, I have made direct contact with approximately **2,500 individuals** across Kentucky. I have made over **30 on-farm consultations** and spent over **400 hours** responding to emails and phone calls pertaining to commercial vegetable production. I have also assisted with the organization and planning of the annual Kentucky Fruit and Vegetable conference. I organized and led a three-part high tunnel webinar series for county agents and growers. I also organized and led high tunnel-focused field day at the UK Horticulture Research Farm that had approximately 70 people in attendance.

AGENT TRAININGS *(310 clientele reached)*

2019 ANR East Update. *Root-knot nematodes and tomato grafting.* Oct. 23, 2019. Winchester, KY.

Agent high tunnel training. *High tunnel construction.* Aug. 20-22 and Aug. 27-29, 2019. Lexington, KY.

Agent IPM Training. *Preventative and cultural IPM methods for vegetable crops*. July 17-18, 2019. Lexington, KY.

2019 Horticulture Agent Training. *Basic greenhouse management.* May 21, 2019. Springfield, KY.

2018 Agent Training Webinar. *High tunnels: features, constructions, principles, and practical management.* Dec. 6, 2018. Newport, KY.

2018 ANR East Update*. Commercial vegetable production updates*. Nov. 7, 2018. Winchester, KY.

2018 Horticulture Agent Training Webinar. *High tunnels: features, constructions, principles, and practical management.* Sept. 26, 2018. Newport, KY.

Agent IPM Training. *Cultural, mechanical, and preventative IPM strategies for small scale vegetable producers*. July 11, 2018. Lexington, KY.

STATEWIDE MEETINGS *(350 clientele reached)*

Kentucky Fruit and Vegetable Conference. *Grafted tomato plants and root knot nematodes.* Jan. 7, 2020.

Kentucky Fruit and Vegetable Conference. *Soil testing and management in organic systems*. Jan. 8, 2019.

Kentucky Fruit and Vegetable Conference. *High tunnel vegetable cultivar trial updates*. Jan. 8, 2019.

EXTRAMURAL FUNDING

**Rudolph, R.E.** (PI). *Tomato grafting for improved vegetable production in Kentucky high tunnels.* Kentucky Department of Agriculture Specialty Crop Block Grant Project. Total project funding: $71,067. 2019-2022.

**Rudolph, R.E.** (PI). Collaborators: R. Bessin, K.L. Jacobsen, J. Obrycki, E. Pfeufer, and T.A. Woods. *Experiential high tunnel training for cooperative extension service agents in Kentucky.* Southern Sustainable Agriculture Research and Education Professional Development Program. Total project funding: $64,304. 2019-2021.

HATCH FUNDING

**Rudolph, R.E.** (PI). *Alternative management methods to enhance sustainability of Kentucky vegetable production systems.* United States Department of Agriculture Cooperative State Research Education and Extension Service - Hatch Project. Funding period: October 2019 –September 2024.

GRANT PROPOSALS SUBMITTED

**Rudolph, R.E.** (PI), N. Gauthier, and J. Larson. *Evaluating the rotation of tomato with fresh-cut flowers in high tunnel system for pest and disease management and economic feasibility.* Southern IPM Center. Total request: $30,000. Submitted Dec. 2, 2019.

Velandia, M. (PI), A. Wszelaki., S. Schexnayder, C. Clark, **R. Rudolph**, T. Woods, I. Meadows, and C. Mauney. *Promoting the adoption of sustainable mulches by small-scale growers in the upper Southeast.* Southern Sustainable Agriculture Research and Education Program. Total request: $299,972. UK subcontract: $90,000. Submitted Nov. 15, 2019.

**Rudolph, R.E.** (PI), B. Lee, R. Durham. *Don’t P on your vegetables! More fertilizer does not always grow better tomatoes.* Kentucky Water Resources Research Institute. Total request: $9,982. Not funded, 2019.

PUBLICATIONS *(since 2018)*

PEER-REVIEWED JOURNAL ARTICLES

*\*indicates corresponding author.*

1. **\*Rudolph, R.E.**, L.W. DeVetter, I.A. Zasada, C. Hesse. 2019. Effects of annual and perennial alleyway cover crops on physical, chemical, and biological properties of soil quality in Pacific Northwest red raspberry. HortScience. *Accepted.*

2. **\*Rudolph, R.E.**, L.W. DeVetter, C. Benedict, and I.A. Zasada. 2019. Raspberry growers’ perceptions and practices regarding soil quality, cover crops, and fumigation. HortTechnology 29(4):482-489.

3. **\*Rudolph, R.E.**, I.A. Zasada, and L.W. DeVetter. 2018. The potential of brassicaceous seed meal amendment and root inoculum removal to affect *Pratylenchus penetrans* and other soil microorganisms in red raspberry (*Rubus idaeus*). App. Soil Ecol. 133:44-51.

4. **Rudolph, R.E.**, T.W. Walters, L.W. DeVetter, I.A. Zasada\*. 2018. Contribution of a winter wheat cover crop to the maintenance of root lesion nematode populations in the raspberry production system. HortTechnology 28(2):182-188.

ABSTRACTS

**Rudolph, R.E.**, E. Pfeufer, and R. Bessin. 2019. Effect of plastic mulch color on aphid populations and virus incidence in summer squash. American Society for Horticultural Science Annual Conference. Las Vegas, NV.

PUBLICATIONS IN PREPARATION

**Rudolph, R.E.**, E. Pfeufer, and R. Bessin. Effect of plastic mulch color on aphid populations and virus incidence in summer squash.

EXTENSION PUBLICATIONS

1. **Rudolph, R.** 2019.High tunnel table beet cultivar trial. UK Fruit and Vegetable Annual Research Report. UK PR-762, p. 19-20
2. **Rudolph, R.**, R. Bessin, J. Strang, S. Wright, and E. Pfeufer. Vegetable Production Guide for Commercial Growers, 2020-2021. UK ID-36. 132pp. *Update.*

*This is the primary resource for commercial vegetable growers in Kentucky. I served as the primary editor which was a four-month undertaking.*

1. **Rudolph, R.**and R. Durham. 2019. Growing Your Own Garden Calendar.

*This is a 12-month calendar to assist inexperienced gardeners with weekly and monthly garden activities, created in collaboration with Nutritional Education Program. This resource was requested by multiple county agents as needed by their clientele.*

1. **Rudolph, R**. and R. Durham. 2019. Growing Your Vegetables: Preparing Your Garden. UK NEP-219. 7 pp.

*This is a guide to assist people who are inexperienced gardeners set up their garden and prepare the soil for the first time. It was created in collaboration with Nutritional Education Program. This resource was requested by multiple county agents as needed by their clientele.*

1. Durham, R. and **R. Rudolph**. 2019. Growing Your Vegetables: Green Beans. UK NEP-220. 2 pp.

*This is a planting guide to assist inexperienced gardeners. This is a compliment to UK NEP-219.*

1. **Rudolph, R.** and R. Durham. 2019. Growing Your Vegetables: Peppers. UK NEP-221. 2 pp.

*This is a planting guide to assist inexperienced gardeners. This is a compliment to UK NEP-219.*

1. **Rudolph. R.** 2019. Blossom End Rot. University of Kentucky CCD-FS-11. 2 pp.
2. **Rudolph, R.** and J. Knight. 2019. High Tunnel Planting Calendar, Region 1, 2, 3. UK CCD-IG-1.

*This planting calendar was requested by agents and growers. There are three different calendars for the three primary regions of Kentucky (west, central, east). I provided the majority of the temperature (min, max, optimal) and planting date content for each crop.*

1. **Rudolph, R.** and J. Knight. 2019. High Tunnel Planting Calendar Fact Sheet. UK CCD-FS-9. 2 pp.
2. Snyder, J., **R. Rudolph**, C. Smigell, and J. Strang (editors). 2018. Fruit and Vegetable 2018 Annual Research Report. UK PR-757. 40 pp.
3. **Rudolph, R.** and J. Walsh. 2018. High tunnel summer squash and zucchini cultivar trial. UK Fruit and Vegetable Annual Research Report. PR-757, p. 19-20.
4. **Rudolph, R.**, R. Bessin, E. Pfeufer, J. Obrycki, and S. Wright. 2018. An IPM Scouting Guide for Common Problems of High Tunnels and Greenhouse Vegetable Crops in Kentucky. UK ID-235. 22 pp. *Update.*

*I served as the primary editor for the update and revision of the content for the scouting guide. I also added new content and photos to the “Physiological Disorders” section.*

REGIONAL PUBLICATIONS

Handbooks

Kemble, J. (ed.). 2020. Southeastern U.S. Vegetable Handbook.

Kemble, J. (ed.). 2019. Southeastern U.S. Vegetable Crop Handbook.

*I, along with other extension specialists from 12 universities, contribute state-specific information and guidance for use by commercial growers across the Southeastern U.S.*

Regional Research Reports

Maynard, L., P. Langenhoven, W. Guan, and B.R. Bergefurd. 2019. Midwest vegetable trial report for 2018. Purdue Extension Research Bulletin 16-18-18.

My contribution to the report: ***Rudolph, R.*** *and J. Walsh. 2018. High tunnel summer squash and zucchini cultivar trial, 2018, p. 87.*

INVITED SPEAKER PRESENTATIONS *(since 2018)*

Eastern Kentucky Farmer Conference. *The whys and hows of no-till vegetable production.* Feb. 29, 2020. Morehead, KY.

Kentucky Local Food Systems Summit. *Extending the season with high tunnels.* Feb. 26, 2020. Lexington, KY.

Pick TN Conference. *Managing high tunnels for year-round production.* Feb. 21, 2020. Franklin, TN.

Pick TN Conference. *Got high tunnel issues? Grafting for root knot nematode and more.* Feb. 21, 2020. Franklin, TN.

West Virginia Small Farm Conference. *Profitable summer squash and zucchini production.* Feb. 15, 2019. Charleston, WV.

Tri-State Green Industry Conference. *High tunnels: features, construction, principles, and practical management.* Feb. 7, 2019. Cincinnati, OH.

MEDIA CONTRIBUTIONS

WEBSITE

Vegetable Crops Extension and Research: https://vegcrops.ca.uky.edu/

With the assistance of Extension Associate Josh Knight, I have created and continually added to and updated a commercial vegetable production website for growers and agents to find resources and learn about upcoming vegetable production-related events. To date there have been approximately 700 users.

TELEVISION

I have been a guest contributor for 10 morning segments of WBKO 13’s “Farm and Home Show” out of Bowling Green, KY. In 2018, each segment had approximately 10,000 viewers. In 2019, each segment was estimated to have 20,000 viewers. Based on these estimations, I have reached approximately 190,000 viewers.

Featured segments: *High tunnel week, Abiotic disorders of tomatoes, Ground cherry production, Soil sampling.*

NEWSLETTER

I often contribute to the monthly Center for Crop Diversification newsletter which has approximately 1600 subscribers. Featured articles include:

June 2019: *Seasonal vegetable issues—What’s wrong with my sweet corn?*

July 2019: *Seasonal vegetable issues—What’s wrong with my tomato plants?*

September 2019: *Seasonal vegetable issues—What’s wrong with my tomato roots?*

MAGAZINE

"Kentucky Living." March 2019. I provided information for an article about high tunnels in Kentucky. This magazine has a readership of nearly 1 million people.

NEWSPAPER

"The Farmer's Pride." August 16, 2018. I was interviewed regarding high tunnels and ground cherry production. The newspaper has a subscription of 15,000 people.

RADIO

"Get the Scoop" program on Goober 95.1. August 2018. Interview with Agent Kristin Hildabrand about high tunnels and ground cherry production. Radio program reaches multiple counties and approximately 15,000 listeners. There were two separate programs with an approximate total number of listeners of 30,000.

GRADUATE STUDENT ADVISING

COMMITTEE MEMBER

Faye Kuosman, M.Sc. (non-thesis) student, Integrated Plant and Soil Science. Graduated Dec. 2019.

Ryan Kuesel, Ph.D. student, Entomology, 2018-present.

Macy Fawn, M.Sc. (non-thesis) student, Science, Translation, and Outreach Program, 2018-present.

Kristi Durbin, M.Sc. student (non-thesis), Integrated Plant and Soil Science, 2018-present.

AWARDS

2019 Outstanding Education Materials Award-PowerPoint, American Society for Horticultural Science Extension Division

2019 Outstanding Education Materials Award-Primary Visual, American Society for Horticultural Science Extension Division

TEACHING

GUEST LECTURES

GEN 100 Issues in Agriculture, Food, and Environment. Discussed a less capitalized model of farming as an alternative to what is currently being practiced. Oct. 11, 2019.

ENT 310 Pests of Field Crops. *Plant-parasitic nematodes.* Sept. 30, 2019.

PLS 502 Fruit and Vegetable Production. *Irrigation in horticultural systems.* April 10, 2019.

PLS 502 Fruit and Vegetable Production. *High tunnel production systems.* Feb. 27, 2019.

PROFESSIONAL DEVELOPMENT

Plant-parasitic nematode identification course. December 8, 2018 - December 14, 2018. Clemson University. Clemson, SC. Provided training in separation of nematodes from soil and plant material and identification of nematodes to genus. Approximately 20 hours of formally presented material and 30 hours of laboratory instruction.

SERVICE AND MEMBERSHIP

COMMITTEES, ADVISORY BOARDS

ASHS Commercial Horticulture Professional Interest Group—Chair

Kentucky Vegetable Growers Association—Advisor

Organic Association of Kentucky—Advisor

Cultivate Kentucky

Horticulture Department Farm Committee

REVIEWING ACTIVITIES

Agronomy (2019: 1)

HortScience (2019: 1)

HortTechnology (2019: 1; 2020: 1)

Plant Disease (2018: 1; 2019: 1; 2020: 1)

Southern SARE Research and Education Grant (2019: 1)

UK Center for Crop Diversification (2018: 5; 2019: 5)

MEMBERSHIP TO PROFESSIONAL AND HONORARY SOCIETIES

American Society for Horticultural Science (ASHS)

Southeastern Vegetable Extension Workers (SEVEW)

Southern Extension and Research Activity (SERA-45)

Kentucky Association of State Extension Professionals (KASEP)

OTHER ACTIVITIES

Kentucky State Fair Judge, Vegetables and Melons Open Classes. 2018, 2019.