

Virginia Tech Pesticide Programs

Annual Report – 2023

VTPP



Virginia Tech
Pesticide Programs

Virginia Tech Pesticide Programs (VTPP) provide pesticide safety information, training, and educational resources to pesticide applicators, Extension faculty, and the public. Our mission is to minimize the human health and environmental impacts associated with improper handling and application of pesticides. VTPP works with other state agencies including the Virginia Department of Agriculture and Consumer Services and Virginia Cooperative Extension to advance the quality of pesticide safety education in Virginia and beyond.

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Virginia Tech Pesticide Programs Team

Faculty

Daniel Frank	Director
Stephanie Blevins-Wycoff	Extension Associate
Kathleen Miller	Extension Associate
Rachel Parson	Extension Associate

Staff

Dana Beegle	Publications Manager & Public Relations
Jacqueline Brown	Education Support Specialist
Grant Schiermeyer	Live Zoo Curator
Shanan Sessor	Office Manager
Dana Watson	Multimedia Technician (joined program Aug. 2023)
Whitney Weaver	Media Specialist & Science Literacy Program Coordinator

Pesticide Applicator Training Manuals and Exams

Manual and Exam Revisions: VTPP produces new and revises existing pesticide applicator training manuals as part of a Memorandum of Agreement with the Virginia Department of Agriculture and Consumer Services, Office of Pesticide Services (VDACS-OPS).

Author/reviewer committees are organized and content is written, edited, and formatted as part of the manual production/revision process. Core and category exams are written/revised as needed to correspond to manual changes. Below is a list of manual and exam revisions completed during 2023.

Category 4, Seed Treatment: Manual released to the public in November 2023. Exam has been approved by VDACS-OPS and is awaiting upload to the Department of Motor Vehicle (DMV) testing centers.

Manual Orders: Pesticide applicator training manuals are ordered and distributed through the Virginia Cooperative Extension (VCE) Storefront and printed through a contract with Office Depot. In total, 3,207 pesticide applicator training manuals were ordered and distributed in 2023. Quarterly order numbers are listed in the following table for each pesticide applicator category and manual title.

Manual Orders by Quarter in 2023

Applicator Category and Manual Title	Quarter				Total
	1	2	3	4	
Core: Applying Pesticides Correctly	429	441	334	247	1451
1A: Agricultural Plant Pest Control	27	27	30	16	100
1B: Agricultural Animal Pest Control	4	4	7	2	17
1C: Fumigation of Soil and Agricultural Products	6	4	8	2	20
1D: Chemigation	0	1	2	2	5
2: Forest Pest Control	14	17	29	14	74
3A: Ornamental Pest Control	77	61	51	56	245
3B: Turf Pest Control	133	85	56	62	336
4: Seed Treatment	4	5	4	16	29
5A: Aquatic Pest Control	16	12	12	7	47
5B: Marine Anti-Foulant Paint	1	5	0	0	6
6: Right-of-Way Pest Control	67	50	46	43	206
7A: General Pest Control	72	61	51	48	232
7B: Management of Wood Destroying Organisms	41	32	31	35	139
7C: Fumigation (Non-Agricultural)	5	3	2	3	13
7D: Vertebrate Pest Control	15	8	5	10	38
7E: Sewer Root Pest Control	2	3	2	1	8
8: Public Health Pest Control	43	39	27	29	138
9: Regulatory Pest Control	2	5	3	2	12
10: Demonstration and Research Pest Control	6	21	11	2	40
11: Aerial Pest Control	8	14	5	8	35
12: Wood Preservation and Wood Products Treatment	3	2	3	1	9
Predator Management	2	2	0	3	7
TOTAL	977	902	719	609	3207

Pesticide Certification and Recertification Training

Department of Conservation and Recreation (DCR) Pesticide Training: VTPP offers online training for DCR planners seeking general pesticide safety knowledge for continuing education credit. These individuals are not pursuing pesticide applicator certification. In total, 39 individuals completed the DCR course in 2023.

Online Pesticide Certification Preparation Training: VTPP offers online training courses for pesticide applicators seeking certification. Applicators practice for the certification exam(s) by completing different lessons corresponding to units in the respective pesticide applicator training manual. Courses are open to any prospective Virginia commercial/private applicator, registered technician, educator, or employer seeking to train new pesticide applicators or students. The number of individuals enrolled in online core and category specific courses in 2023 are listed in the following tables.

Online Core Training Enrollment in 2023

Applicator Type	# of individuals enrolled
Commercial	156
Government	63
Registered Technician	236
Private	38
TOTAL	493

Online Commercial Category Training Enrollment in 2023

Applicator Category	Applicator Type		Total
	Commercial	Government	
1A: Agricultural Plant Pest Control	30	5	35
1B: Agricultural Animal Pest Control	2	2	4
1C: Fumigation of Soil and Agricultural Products	2	2	4
1D: Chemigation	1	2	3
2: Forest Pest Control	12	12	24
3A: Ornamental Pest Control	52	17	69
3B: Turf Pest Control	60	20	80
4: Seed Treatment	4	3	7
5A: Aquatic Pest Control	8	5	13
5B: Marine Anti-Foulant Paint	1	0	1
6: Right-of-Way Pest Control	27	22	49
7A: General Pest Control	62	5	67
7B: Management of Wood Destroying Organisms	25	3	28
7C: Fumigation (Non-Agricultural)	6	1	7
7D: Vertebrate Pest Control	10	3	13
7E: Sewer Root Pest Control	1	1	2
8: Public Health Pest Control	38	5	43
9: Regulatory Pest Control	2	2	4
10: Demonstration and Research Pest Control	1	9	10
11: Aerial Pest Control	15	3	18
12: Wood Preservation and Wood Products Treatment	4	1	5
Predator Management	1	1	2
TOTAL	364	124	488

Private Applicator Recertification Course Approval: VTPP works with VCE agents and specialists to approve, process, and coordinate recertification training courses for private pesticide applicators. In 2023, 103 private applicator recertification course requests were approved and processed by VTPP, which resulted in 2,157 course participants receiving pesticide recertification credit. Overall, 2,097, 45, 15 individuals received pesticide recertification credit through VCE sponsored in-person, on-line, and correspondence training sessions, respectively.

Winter Recertification Training: VTPP conducts two annual commercial and private pesticide applicator recertification courses. The first course served Virginia Tech employees and pesticide applicators living in the surrounding area. The training was held January 10 and covered commercial applicator categories 1A, 1B, 10, and 60, and private applicator categories 90 and 91. The second course provided recertification training/credit for various commercial pesticide applicator categories. This training was held January 11 and covered commercial applicator categories 1A, 2, 5A, 6, 8, 10, 11, and 60. The course was also approved for reciprocal recertification credits by the following states: Pennsylvania, West Virginia, Kentucky, Indiana, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas, North Carolina, and Texas. In total, 40 participants attended the trainings and 34 received recertification credit.

Private Pesticide Applicator Exam Grading

VTPP began grading and entering data for private pesticide applicator exams in May of 2023. Private pesticide applicators use or supervise the use of restricted-use pesticides to produce an agricultural commodity. The number of individuals taking the exam in 2023 (including pass/fail rates) for occupational and continuing or technical education (CTE) are listed in the following tables.

Private Pesticide Applicator Exams Graded by Quarter in 2023

Exam Type	Qtr. 1		Qtr. 2		Qtr. 3		Qtr. 4		Combined		
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Total
Initial	n/a		36	11	16	5	48	6	100	22	122
Recertification			5	0	1	0	6	0	12	0	12
Reinstatement			19	0	7	0	9	3	35	3	38
Retest			1	0	0	1	3	1	4	2	6
TOTAL			61	11	24	6	66	10	151	27	178

CTE* Private Pesticide Applicator Exams Graded by Quarter in 2023

	Classes	Total Students
Quarter 1	6	123
Quarter 2	13	223
Quarter 3	1	5
Quarter 4	10	168
TOTAL	30	519

*Continuing or technical education (CTE) for high school or community college students.

Train-the-Trainer Activities

Pesticide Safety Education Workshop (PSEW): VTPP conducts an annual Virginia Pesticide Safety Educators (train-the-trainer) Workshop for VCE faculty, and VDACS staff. Each year, the workshop highlights several areas of pesticide safety education. PSEW 2023 was held August 24-25 at the Hotel Roanoke. Category 10: Demonstration and Research Pest Control testing and new agent orientation also took place during the workshop.

Annual PSEW Participation in 2023

	Total
# of participants	75
# of VCE agents participating	49
# of participants testing for commercial pesticide certification in Category 10	2
# of participants receiving recertification credit	42

PSEW Canvas Website: The PSEW Canvas website is available year-round to pesticide safety educators in Virginia. It acts as an organizational hub for the yearly PSEW and as a means for sharing educational resources throughout the year. The website received 1,604 total pageviews in 2023.

Other Extension Programs and Activities

VTPP Media Library: In 2021, VTPP created a digital media library (vtechworks.lib.vt.edu/handle/10919/102775) in collaboration with VTechWorks (an open access repository provided by University Libraries at Virginia Tech). The goals of the media library are to support pesticide safety and Integrated Pest Management programming efforts, and provide opportunities for building and broadening information exchange and collaborations with other state programs, agencies, and associations. The library also complements existing resources on other publicly available platforms (e.g., bugwood.org and ipmimages.org). VTPP continually adds high-quality pictures and videos to the library, and works with VCE faculty and other cooperators to solicit additional content. In 2023, over 360 digital images and videos with appropriate metadata were added to the media library. The library received over 1,435 total pageviews in 2022 and 2023 combined.

Pesticide Safety Education Month: Beginning in 2020, VTPP joined a national effort to bring awareness to Pesticide Safety Education Programs, State Lead Agencies (e.g., VDACS), and pesticide safety education by celebrating National Pesticide Safety Education Month each February. In 2023, VTPP used online tools to highlight consumer pesticide safety issues and resources. VTPP created a National Pesticide Safety Education Month page on the vtp.org website to offer downloadable content focused on various pesticide safety education topics. VTPP also linked this content to its social media page. The posts on social media reached 57 individuals directly, and the public page on the website received 27 unique page visitors.

Hokie BugZoo: VTPP currently maintains an insect zoo containing a diversity of insects and other arthropods from around the world (currently over 2,000 specimens belonging to over 40 species), many of which are unknown to the average person. The insect zoo is used for a number of VTPP sponsored public outreach and science literacy education programs, and various K-12 and organizational youth activities. It is also the basis for several labs in the entomology curriculum at Virginia Tech. In 2023, VTPP exhibited zoo specimens as part of Hokie BugFest, engaging with over 6,100 members of the public. Additionally, zoo specimens were featured at four local youth outreach events and four university/AREC outreach events, reaching a combined audience of over 2,500 individuals. Furthermore, these specimens were incorporated into lectures for two Virginia Tech courses, reaching approximately 150 undergraduate students.

Hokie BugCamp: Each year, VTPP and the Virginia Tech Department of Entomology hosts an entomologically themed camp for youth ages 6-13 called Hokie BugCamp. In 2023, three 2-hour camp sessions were held at Blacksburg Heritage Community Park and Natural Area during July 7-8. Youth participants and their families were provided instruction and demonstration of insect collecting and pinning techniques. Youth participants were then provided hands-on opportunities to collect insects from a variety of habitats and pin their specimens. An optional “camp box” that participants could purchase (at cost) was also available. Contents of the camp box included a collection box, collecting supplies, insect identification books, and other materials to extend insect study at home. Overall, Hokie BugCamp reached 117 youth and their parents/guardians.

Hokie BugFest: VTPP and the Virginia Tech Department of Entomology annually hosts a science literacy event called Hokie BugFest, which is open to the general public. The event promotes the understanding and appreciation of insects and other arthropods by offering an array of STEAM (science, technology, engineering, art, and math) enrichment experiences tailored for youth, families, and K-12 educators. Educational experiences offered during the event include entomological research displays, insect themed arts and crafts, live arthropod specimens, curated insect displays, and other special events and activities. The 2023 Hokie BugFest was held October 7 and was attended by over 6,100 individuals. In addition, an online Hokie BugFest was hosted on the Department of Entomology, Hokie BugFest website in 2023. The online event featured videos, photos, and downloadable at-home activities from 15 virtual exhibit booths. The online Hokie BugFest is available throughout the year, and received 282 total pageviews in 2023.

4-H Insect Collection Contest: VTPP continued its 4-H Insect Collection Contest during the annual Hokie BugFest. 4-H agents were encouraged to participate from all counties across the state. The contest was also promoted at local summer camps and schools. Entries were submitted individually and as teams. In 2023, we partnered with the Blacksburg Public Library to serve as a drop-off location, and then transported the collections to Squires Student Center to be judged and displayed during the Hokie BugFest event. There were 5 entries from 4 Virginia counties/cities (Alexandria City, Radford City, Pulaski, and Scott).

Outreach Event Participation: In 2023, VTPP participated in public outreach events for the Valley Classical School, Floyd Elementary, and VT Alumni Association. In total, 89 youth (1st - 4th grade) from the Valley Classical School and Floyd Elementary were provided with information and resources focused on general entomology and pesticide safety. Over 1,000 individuals were provided with information and resources focused on general entomology during the VT Alumni Association tailgate.

Publications, Presentations, and Interviews

Peer-Reviewed Journal Articles:

- Bekelja, K., K. Miller, T. Kuhar, C. Krupke, and S. Taylor. 2023. Removing neonicotinoid seed treatments has negligible effects on refuge function and crop protection in transgenic maize targeting western corn rootworm (Coleoptera: Chrysomelidae). *Journal of Economic Entomology*. 116: 823-834.
- Frank, D. L. and J. Brown. 2023. Creation of a digital media library to support pesticide safety education programming. *Journal of Pesticide Safety Education*. 25: 13-16.

VCE Fact Sheets:

- Blevins-Wycoff, S., D. L. Frank, R. Parson, K. Miller, A. Appling, and M. Sutphin. Myth-busting homemade pesticides. Virginia Cooperative Extension. Publication ENTO-570NP.
- Frank, D. L., and S. Blevins-Wycoff. Selecting a pest control company. Virginia Cooperative Extension. Publication ENTO-558NP.

VCE Pest Management Guides (updated sections on pesticide safety and application):

- Flessner, M., D. Langston, et al. including K. Miller and D. L. Frank. 2023. Pest Management Guide: Field Crops. Virginia Cooperative Extension. Publication 456-016.
- Hong, C., E. Day, et al. including R. Parson and D. L. Frank. 2023. Pest Management Guide: Horticultural and Forest Crops. Virginia Cooperative Extension. Publication 456-017.
- Rideout, S, J. Samtani, et al. including S. Blevins-Wycoff and D. L. Frank. 2023. Pest Management Guide: Home Grounds and Animals. Virginia Cooperative Extension. Publication 456-018.
- Pfeiffer, D. G., et al. including D. L. Frank. 2023. Spray Bulletin for Commercial Tree Fruit Growers. Virginia Cooperative Extension. Publication 456-419.

VTPP Quarterly Newsletter: Beginning in May 2020, VTPP released the first issue of its new quarterly newsletter, VTPP Quarterly. Goals of the newsletter are threefold: distribute timely and informative pesticide safety information to a broad audience, create and maintain relationships with VCE personnel, and promote VTPP programs and activities. In its fourth year, the newsletter was published in the winter (January), spring (April), summer (July), and fall (October) of 2023. We used VCE email listservs and the VTPP website for distribution.

Other Publications:

- Frank, D. L. An introduction to IPM. Virginia Forest Landowner Update. 37(1): 1-4.
- Blevins-Wycoff, S., W. Weaver, S. Whithaus, B. Danielson, and J. Warnke. 2023. American Association of Pesticide Safety Educators Quarterly Newsletter. S. Blevins-Wycoff (ed.). 1(1): 1-8.
- Blevins-Wycoff, S., W. Weaver, S. Whithaus, B. Danielson, J. Warnke, G. Merkl, and S. Gripp. 2023. American Association of Pesticide Safety Educators Quarterly Newsletter. S. Blevins-Wycoff (ed.). 1(2): 1-12.
- Blevins-Wycoff, S., W. Weaver, S. Whithaus, B. Danielson, A. Bachmann, and S. Hirnyck. 2023. American Association of Pesticide Safety Educators Quarterly Newsletter. S. Blevins-Wycoff (ed.). 1(3): 1-11.

Conference Presentations:

- Bekelja, K., S. Taylor, K. Miller, C. Krupke, and D. Reisig. 2023. Informing insect resistance management practices in Bt maize. Entomological Society of America, Eastern Branch Conference. Providence, RI.
- Frank, D. L. 2023. A new digital media library to support pesticide safety education programming. American Association of Pesticide Safety Educators, Southern Region Conference. Jacksonville, FL.

Extension and Outreach Presentations:

- Appling, A., S. Blevins-Wycoff, D. L. Frank, D. K. Miller, R. Parson, and M. Sutphin. Misconceptions surrounding homemade pesticides. Virginia Cooperative Extension Winter Conference. Blacksburg, VA.
- Barrow, M., S. Blevins-Wycoff, C. Gregg, and R. Parson. 2023. New agent orientation. Pesticide Safety Educators Workshop. Roanoke, VA.
- Blevins-Wycoff, S. 2023. New River Valley IPM and pesticide safety training for Master Gardeners. Virginia Extension Master Gardener Program. Blacksburg, VA.

- Frank, D. L. 2023. Pesticide application jeopardy. Virginia Association of Forest Health Professionals Conference. Blacksburg, VA.
- Frank, D. L. 2023. Right-of-way pest management. Virginia Department of Transportation Registered Technician Recertification Training. Richmond, VA.
- Frank, D. L. 2023. Right-of-way pest management. Virginia Department of Transportation Roadside Vegetation Workshop. Blacksburg, VA.
- Frank, D. L. 2023. Public health pest management. Virginia Department of Transportation Roadside Vegetation Workshop. Blacksburg, VA.
- Frank, D. L. 2023. Pesticide formulations. 2023-2024 Online Virginia Private Pesticide Applicator Recertification Training. Virtual Event.
- Frank, D. L. 2023. Pesticide application equipment. 2023-2024 Online Virginia Private Pesticide Applicator Recertification Training. Virtual Event.
- Frank, D. L. 2023. Protecting the environment. 2023-2024 Online Virginia Private Pesticide Applicator Recertification Training. Virtual Event.
- Frank, D. L. 2023. Pesticide labeling. 2023-2024 Online Virginia Private Pesticide Applicator Recertification Training. Virtual Event.
- Frank, D. L. 2023. Pesticide incompatibilities. 2023-2024 Online Virginia Private Pesticide Applicator Recertification Training. Virtual Event.
- Frank, D. L. 2023. Bugs at the Virginia Tech Entomology Department. Get Schooled! Virtual Field Trips. Blue Ridge Public Broadcasting Station.
- Frank, D. L. 2023. Entomology as a career. Harding Avenue Elementary Career Day. Blacksburg, VA.
- Frank, D. L., D. Beegle, and S. Blevins-Wycoff. 2023. Hokie BugFest on the Go: Bringing science to life in the classroom. Virginia Cooperative Extension Winter Conference. Blacksburg, VA.
- Gregg, C., R. Parson, and S. Blevins-Wycoff. 2023. Equipment WISE: Nozzle patterns and sprayer calibration. Women in Agriculture Conference. Madison, VA.
- Miller, K. 2023. Backpack sprayer calibration. Virginia Department of Forestry Forest Management Academy. Sweet Briar, VA.
- Miller, K. 2023. Turf pest control. Virginia Department of Transportation Roadside Vegetation Workshop. Blacksburg, VA.
- Miller, K. 2023. Ornamental pest control. Virginia Department of Transportation Roadside Vegetation Workshop. Blacksburg, VA.
- Miller, K. and D. L. Frank. 2023. Spray table demonstration. Virginia Pesticide Safety Educator's Workshop. Roanoke, VA.
- Parson, R. and D. L. Frank. 2023. Pesticide transportation, security, and storage. VCE pesticide training. Emporia, VA
- Parson, R and S. Blevins-Wycoff. 2023. Laundering pesticide-contaminated clothing. Virginia Pesticide Safety Educator's Workshop. Roanoke, VA.
- Parson, R. and S. Blevins-Wycoff. 2023. Use N95 masks for dry formulations and keep pesticides in original containers. VT CALS Commercial and Private Pesticide Applicator Recertification Training. Blacksburg, VA.

Interviews:

- Blevins-Wycoff, S. 2023. Hundreds of creepy, crawly and flying insects on display at Saturday's Hokie BugFest. WVTF Public Radio.
- Frank, D. L. 2023. An Interview with Daniel Frank on the Virginia Tech Pesticide Programs (VTPP) Digital Media Library. American Association of Pesticide Safety Educators.

Website and Social Media Statistics

VTPP Website: As a “front door” for information about pesticide safety education and applicator certification, VTPP redesigned its website (vtp.ento.vt.edu/ or vtp.org) in 2020 to be more user friendly, intuitive, and aesthetically pleasing. The website provides greater ease of navigation and site accessibility for its users, and it offers a wealth of information for its major client groups. The site provides a platform to keep pesticide applicators up to date on any changes to state and federal regulations, as well as provide information on the wide range of topics that its clientele request on a daily basis. The website menu provides links to specific resources for Extension agents, pesticide applicators, pesticide businesses, and the public. Resources include general information about certification and recertification requirements in Virginia, relevant forms, available training opportunities, pesticide laws and regulations, and frequently asked questions. The website provides information for potential pesticide applicators on how to purchase training manuals and register for online certification preparation courses. In addition, the website provides links to IPM and pesticide safety resources developed by Virginia Tech, VCE, VDACs, and other national IPM and pesticide safety information resource groups. The website received over 26,000 total pageviews (78% were unique visitors) in 2023.

VTPP Consumer Pesticide Safety Website: In August 2019, VTPP launched its Consumer Pesticide Safety Website (sites.google.com/vt.edu/vtpconsumerpse), which delivers pesticide safety information to the general public. The site employs an easy-to-use navigation scheme and a wealth of graphics to cover topics such as the safe and proper use of pesticide products, personal protective equipment, proper storage and disposal of pesticides, what to do in a pesticide emergency, pesticide resistance, and integrated pest management. The website is regularly updated with new resources added. The website received 362 total pageviews (95% were unique visitors) in 2023.

VTPP Social Media: VTPP maintains two social media accounts on Facebook; a Larry the Label account that focuses on providing pesticide safety updates and information, and a Hokie BugFest account that focuses on providing information about outreach opportunities provided by VTPP as well as general entomology related information. In 2023, The Larry the Label and Hokie BugFest accounts had total reach of 468 and 44,707, respectively.