

# Virginia Tech Pesticide Programs

## *Annual Report – 2024*

# VT PP



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
Micah Thomas	Live Zoo Curator
Shanan Sessor	Office Manager
Dana Watson	Multimedia Technician
Whitney Weaver	Media Specialist & Science Literacy Program Coordinator

## Pesticide Applicator Numbers, 2024

Applicator Type	# of Individuals Certified in VA
Commercial	7,083
Registered Technician	14,335
Private	4,768
<b>TOTAL</b>	<b>22,253</b>

## Pesticide Applicator Training Manuals and Exams

**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. A total of 3,495 pesticide applicator training manuals were ordered and distributed in 2024. The quarterly order numbers are listed in the following table for each pesticide applicator category and manual title.

### Manual Orders by Quarter in 2024

Applicator Category and Manual Title	Quarter				Total
	1	2	3	4	
Core: Applying Pesticides Correctly	663	381	340	213	<b>1,597</b>
1A: Agricultural Plant Pest Control	37	11	22	15	<b>85</b>
1B: Agricultural Animal Pest Control	4	6	4	1	<b>15</b>
1C: Fumigation of Soil and Agricultural Products	7	3	4	4	<b>18</b>
1D: Chemigation	2	0	3	0	<b>5</b>
2: Forest Pest Control	16	12	18	8	<b>54</b>
3A: Ornamental Pest Control	122	67	67	43	<b>299</b>
3B: Turf Pest Control	161	82	62	50	<b>355</b>
4: Seed Treatment	8	2	1	6	<b>17</b>
5A: Aquatic Pest Control	22	18	20	15	<b>75</b>
5B: Marine Anti-Foulant Paint	1	0	0	0	<b>1</b>
6: Right-of-Way Pest Control	97	65	33	34	<b>229</b>
7A: General Pest Control	90	38	65	56	<b>249</b>
7B: Management of Wood Destroying Organisms	52	34	72	36	<b>194</b>
7C: Fumigation (Non-Agricultural)	10	3	2	0	<b>15</b>
7D: Vertebrate Pest Control	17	4	6	21	<b>48</b>
7E: Sewer Root Pest Control	2	1	1	1	<b>5</b>
8: Public Health Pest Control	53	22	28	25	<b>128</b>
9: Regulatory Pest Control	5	1	4	1	<b>11</b>
10: Demonstration and Research Pest Control	10	6	17	8	<b>41</b>
11: Aerial Pest Control	18	4	10	6	<b>38</b>
12: Wood Preservation and Wood Products Treatment	5	1	2	2	<b>10</b>
Predator Management	1	3	0	2	<b>6</b>
<b>TOTAL</b>	<b>1403</b>	<b>764</b>	<b>781</b>	<b>547</b>	<b>3,495</b>

## 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. A total of 4 individuals completed the DCR course in 2024.

**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 2024 are listed in the following tables.

**Online Core Training Enrollment in 2024**

<b>Applicator Type</b>	<b># of Individuals Enrolled</b>
Commercial	157
Registered Technician	288
Private	51
<b>TOTAL</b>	<b>496</b>

### Online Commercial Category Training Enrollment in 2024

Applicator Category	# of Individuals Enrolled
1A: Agricultural Plant Pest Control	36
1B: Agricultural Animal Pest Control	3
1C: Fumigation of Soil and Agricultural Products	2
1D: Chemigation	1
2: Forest Pest Control	20
3A: Ornamental Pest Control	77
3B: Turf Pest Control	95
4: Seed Treatment	2
5A: Aquatic Pest Control	19
5B: Marine Anti-Foulant Paint	0
6: Right-of-Way Pest Control	60
7A: General Pest Control	72
7B: Management of Wood Destroying Organisms	37
7C: Fumigation (Non-Agricultural)	6
7D: Vertebrate Pest Control	8
7E: Sewer Root Pest Control	1
8: Public Health Pest Control	39
9: Regulatory Pest Control	6
10: Demonstration and Research Pest Control	9
11: Aerial Pest Control	15
12: Wood Preservation and Wood Products Treatment	1
Predator Management	1
<b>TOTAL</b>	<b>510</b>

**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 2024, 86 private applicator recertification course requests were approved and processed by VTPP, which resulted in 2,021 course participants receiving pesticide recertification credit. Overall, 1,890, 58, and 73 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, held on January 9, served Virginia Tech employees and pesticide applicators from the surrounding area. It covered commercial applicator categories 1A, 1B, 10, and 60, as well as private applicator categories 90 and 91. The second course, held on January 11, provided recertification training and credit for various commercial pesticide applicator categories, including 1A, 2, 5A, 6, 8, 10, 11, and 60. This 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, 29 participants attended the trainings, and 27 received recertification credit.

## Private Pesticide Applicator Exam Grading

VTPP began grading and entering data for private pesticide applicator exams beginning in May of 2023. Private pesticide applicators use or supervise the use of restricted-use pesticides to produce an agricultural commodity. The number of exams graded in 2024 for occupational and continuing or technical education (CTE) individuals are listed in the following tables.

**Private Pesticide Applicator Exams Graded by Quarter in 2024**

Exam Type	Quarter				Total
	1	2	3	4	
Initial	112	77	23	35	<b>247</b>
Recertification	18	2	3	0	<b>23</b>
Reinstatement	42	29	9	3	<b>83</b>
Retest	13	0	0	0	<b>13</b>
<b>TOTAL</b>	<b>185</b>	<b>108</b>	<b>35</b>	<b>38</b>	<b>366</b>



### CTE\* Private Pesticide Applicator Exams Graded by Quarter in 2024

Quarter	Classes	# of Students
1	5	145
2	12	239
3	0	0
4	12	181
<b>TOTAL</b>	<b>29</b>	<b>565</b>

\*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 2024 was held Sept. 5-6 at the Hotel Roanoke Inn and Conference Center. Category 10: Demonstration and Research Pest Control testing and new agent orientation also took place during the workshop.

#### Annual PSEW Participation in 2024

	Total
# of participants	94
# of VCE agents participating	64
# of participants testing for commercial pesticide certification in Category 10	14
# of participants receiving recertification credit	49

**Integrated Pest Management (IPM) Workshop:** In 2024, VTPP conducted an IPM (train-the-trainer) Workshop for VCE faculty. The two-day workshop highlighted both new and existing IPM practices and technologies relevant to agronomic and specialty crops, empowering VCE agents and educators with the knowledge and skills needed to effectively disseminate IPM practices within their communities. The workshop took place on November 6-7 at the Hotel Roanoke Inn and Conference Center, with a total of 40 VCE agents and specialists in attendance.

**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 VTPP's educational resources throughout the year. The website received 2,255 total pageviews in 2024.

## Other Extension Programs and Activities

**VTPP Media Library:** In 2021, VTPP created a digital media library ([vtechworks.lib.vt.edu/handle/10919/102775](https://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, as well as to provide opportunities for building and expanding 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 images and videos to the library and collaborates with VCE faculty and other partners to solicit additional content. In 2024, over 451 digital images and videos were available (creative commons CC-BY license) in the media library, which received 298 total page views.

**Pesticide Safety Education Month:** Beginning in 2020, VTPP joined a national effort to raise awareness of Pesticide Safety Education Programs, State Lead Agencies (e.g., VDACS), and pesticide safety education by celebrating National Pesticide Safety Education Month each February. In 2024, 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](https://vtp.org) website, offering downloadable content focused on various pesticide safety education topics. The content was also linked to VTPP's social media page, where posts directly reached 1,744 individuals.

**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 various VTPP-sponsored public outreach and science literacy education programs, as well as K-12 and organizational youth activities. It also serves as the basis for several labs in the entomology curriculum at Virginia Tech. In 2024, VTPP showcased zoo specimens at Hokie BugFest, engaging with over 8,000 members of the public. Additionally, zoo specimens were featured at 19 public outreach events, reaching a combined audience of approximately 2,900 individuals. These specimens were also incorporated into lectures for three Virginia Tech courses, reaching approximately 195 undergraduate students.

**Hokie BugCamp:** VTPP and the Virginia Tech Department of Entomology annually host an entomologically themed camp for youth ages 6-13 called Hokie BugCamp. In 2024, three 2-hour camp sessions were held at Blacksburg Heritage Community Park and Natural Area on July 12-13. Youth participants and their families received instruction and demonstrations on insect collecting and pinning techniques. Participants were then given hands-on opportunities to collect insects from various habitats and pin their specimens. An optional "camp box," which participants could purchase at cost, was also available. The camp box included a collection box, collecting supplies, insect identification books, and other materials to encourage further insect study at home. Overall, the 2024 Hokie BugCamp reached 120 youth and their parents/guardians.

**Hokie BugFest:** VTPP and the Virginia Tech Department of Entomology annually host 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 a range of STEAM (science, technology, engineering, art, and math) enrichment experiences tailored for youth, families, and K-12 educators. Educational experiences at the event include entomological research displays, insect-themed arts and crafts, live arthropod specimens, curated insect displays, and other special events and activities. The 2024 Hokie BugFest, held on October 12, was attended by over 8,000 individuals. Additionally, an online version of Hokie BugFest was hosted on the Department of Entomology's website in 2024. The online event featured videos, photos, and downloadable at-home activities from 25 virtual exhibit booths. The online Hokie BugFest is available year-round and received over 5,000 total page views in 2024. To further support engagement, VTPP provided structured support for teachers, including an Educators' Guide specifically developed for K-12 instruction. This guide categorizes online Hokie BugFest exhibits by content type—such as photo galleries, publications, videos, and activities—while aligning them with relevant learning topics, grade-level suitability, and Virginia's Standards of Learning (SOLs) for science.

**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 2024, 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 10 entries from 5 Virginia counties (Montgomery, Pulaski, Scott, Washington, and Wythe).

**Community and Public Outreach Event Participation:** In 2024, VTPP took part in 17 community and public outreach events, engaging approximately 1,650 individuals. These events provided participants with general entomology information, hands-on encounters with live arthropods, general pesticide safety and pest management information, and structured educational activities.

## **Publications, Presentations, and University Courses Taught**

### **Peer-Reviewed Journal Articles:**

- Frank, D. L. and S. B. Wyckoff. 2024. Identifying integrated pest management resource needs among Virginia Master Gardeners. *Journal of Integrated Pest Management*. 15: pmae022 (doi.org/10.1093/jipm/pmae022).
- Wyckoff, S. B., D. L. Frank, and M. J. Weaver. 2024. Comparing entomology-themed outreach events: Annual festivals and open houses in the United States. *Insects*. 15: 337 (doi.org/10.3390/insects15050337).

### **VCE Fact Sheets:**

- Ling, E., R. Parson, D. L. Frank, D. Mohamed, K. Kline, A. Spiller, and D. Horn. 2024. Spray water quality and pesticide characteristics. Virginia Cooperative Extension. Publication BSE-350P.
- Ling, E., R. Parson, D. L. Frank, D. Mohamed, K. Kline, and D. Horn. 2024. Understanding spray tank mixing practices. Virginia Cooperative Extension. Publication BSE-351P.

- Ling, E., K. Kline, R. Parson, D. L. Frank, D. Mohamed, and D. Horn. 2024. Solving spray water problems. Virginia Cooperative Extension. Publication BSE-352P

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

- Flessner, M., D. Langston, et al. including K. Miller and D. L. Frank. 2024. Pest Management Guide: Field Crops. Virginia Cooperative Extension. Publication 456-016.
- Hong, C., E. Day, et al. including R. Parson and D. L. Frank. 2024. 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. 2024. Pest Management Guide: Home Grounds and Animals. Virginia Cooperative Extension. Publication 456-018.
- Pfeiffer, D. G., et al. including D. L. Frank. 2024. Spray Bulletin for Commercial Tree Fruit Growers. Virginia Cooperative Extension. Publication 456-419.

**VTPP Quarterly Newsletter:** Beginning in May 2020, VTPP launched its quarterly newsletter, VTPP Quarterly. The newsletter has three main goals: to provide timely and informative pesticide safety information to a broad audience, to foster and maintain relationships with VCE personnel, and to promote VTPP programs and activities. In 2024, the newsletter marked its fifth year of publication, with issues released in the winter (January), spring (April), summer (July), and fall (October). Distribution was carried out through VCE email listservs and the VTPP website.

#### **Other Publications:**

- Blevins-Wycoff, S., W. Weaver, S. Whithaus, B. Danielson, and A. Bachmann. 2024. American Association of Pesticide Safety Educators Quarterly Newsletter. S. Blevins-Wycoff (ed.). 2(1): 1-8.
- Blevins-Wycoff, S., W. Weaver, S. Whithaus, B. Danielson, and A. Bachmann. 2024. American Association of Pesticide Safety Educators Quarterly Newsletter. S. Blevins-Wycoff (ed.). 2(1): 1-8.
- Blevins-Wycoff, S., W. Weaver, S. Whithaus, B. Danielson, A. Bachmann, S. Tomasko, and D. Beegle. 2024. American Association of Pesticide Safety Educators Quarterly Newsletter. S. Blevins-Wycoff (ed.). 2(2): 1-10.
- Blevins-Wycoff, S., W. Weaver, S. Whithaus, B. Danielson, G. Merkl, E. Crow, and S. Vantassel. 2024. American Association of Pesticide Safety Educators Quarterly Newsletter. S. Blevins-Wycoff (ed.). 2(3): 1-9.

#### **Conference Presentations:**

- Blevins-Wycoff, S. and D. L. Frank. 20024. Junior Entomologists convey attitudes toward arthropods at Hokie BugFest. Entomological Society of America, Eastern Branch Conference. Morgantown, WV.
- Frank, D. L. 2024. IPM practices and challenges: A survey of private pesticide applicators in Virginia. Entomological Society of America, Eastern Branch Conference. Morgantown, WV.
- Frank, D. L. 2024. The changing state of label mitigation measures. American Association of Pesticide Safety Educators, Southern Region Conference. Richmond, VA.

- Frank, D. L. The Virginia Tech Pesticide Programs digital media library. 2024. The Pesticide Stewardship Alliance Conference. St. Louis, MO.

#### **Extension and Outreach Presentations:**

- Blevins-Wycoff, S. and J. Brown. 2024. Pesticide Safety Education Materials for Extension Faculty. Virginia Pesticide Safety Educators Workshop. Roanoke, VA.
- Blevins-Wycoff, S. 2024. IPM and Pesticide Safety Training for Master Gardeners. New River Valley Master Gardener Training Series. Christiansburg, VA.
- Blevins-Wycoff, S. and R. Parson. 2024. Laundering Pesticide-Contaminated Clothing. VT CALS Winter Pesticide Applicator Recertification. Blacksburg, VA.
- Blevins-Wycoff, S. and R. Parson. 2024. Pesticide Labels, Formulations, and Tank Mixing. Registered Technician Certification Training. Salem, VA.
- Frank, D. 2024. IPM in Virginia. Virginia IPM Workshop. Roanoke, VA.
- Frank, D. 2024. IPM and pesticide safety for pest management professionals. Virginia Pest Management Association State Technical Meeting. Richmond, VA.
- Frank, D. 2024. Organic vs. conventional pesticides: Advantages and disadvantages. Delaware Nursery and Landscape Association Ornamental and Turf Workshop.
- Frank, D. L. 2024. Pesticide application equipment. 2024-2025 Online Virginia Private Pesticide Applicator Recertification Training. Virtual Event.
- Frank, D. L. 2024. Pesticide calibration. Virginia Veteran's Affairs Registered Technician Certification Training. Roanoke, VA.
- Frank, D. L. 2024. Pesticide formulations. 2024-2025 Online Virginia Private Pesticide Applicator Recertification Training. Virtual Event.
- Frank, D. L. 2024. Pesticide incompatibilities. 2024-2025 Online Virginia Private Pesticide Applicator Recertification Training. Virtual Event.
- Frank, D. L. 2024. Pesticide labeling. 2024-2025 Online Virginia Private Pesticide Applicator Recertification Training. Virtual Event.
- Frank, D. L. 2024. Pesticides, disease vectors, and public health. Summit Helicopter Commercial Pesticide Applicator Recertification Training. Blacksburg, VA.
- Frank, D. L. 2024. Protecting the environment. 2024-2025 Online Virginia Private Pesticide Applicator Recertification Training. Virtual Event.
- Frank, D. L. 2024. Public health pest management. Southside Virginia Commercial Pesticide Applicator Recertification Training. Collinsville, VA.
- Frank, D. L. 2024. Right-of-way pest control. Summit Helicopter Commercial Pesticide Applicator Recertification Training. Blacksburg, VA.
- Frank, D. 2024. Risk perception and IPM. Virginia IPM Workshop. Roanoke, VA.
- Gregg, C., S. Blevins-Wycoff, and R. Parson. 2024. Personal Protective Equipment, Pesticide Labels, Laundering Pesticide-Contaminated Clothing, and Calibration. Equipment WISE - Women in Agriculture Meeting. Chatham, VA.
- Miller, K. 2024. Spray table demonstration for pesticide recertification trainings. Virginia Pesticide Safety Educators Workshop. Roanoke, VA.
- Parson, R. and S. Blevins-Wycoff. 2024. Category 10: Demonstration and Research Review. Virtual Event.
- Parson, R. and S. Blevins-Wycoff. 2024. Personal Protective Equipment and Laundering Pesticide-Contaminated Clothing. Registered Technician Certification Training. Salem, VA.

- Parson, R. and S. Blevins-Wycoff. 2024. Use N95 masks for dry formulations and keep pesticides in original containers. VT CALS Commercial and Private Pesticide Applicator Recertification Training. Blacksburg, VA.
- Parson, R., S. Blevins-Wycoff, M. Barrow, and C. Gregg. 2024. New agent orientation. Pesticide Safety Educators Workshop. Roanoke, VA.

### **University Courses Taught**

- AT 0554, Chemical Applications. Agriculture Technology Program, Virginia Tech, Blacksburg, VA. Spring semester (3 cr.)
- ENT/PPWS 4264, Pesticide Usage. Department of Entomology, Virginia Tech, Blacksburg, VA. Fall semester (3 cr.).

### **Website and Social Media Statistics**

**VTPP Website:** As a “front door” for information about pesticide safety education and applicator certification, VTPP redesigned its website ([vtppesto.vt.edu/](http://vtppesto.vt.edu/) or [vtppesto.org](http://vtppesto.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 28,896 total pageviews (93% were unique visitors) in 2024.

**VTPP Consumer Pesticide Safety Website:** In August 2019, VTPP launched its Consumer Pesticide Safety Website ([sites.google.com/vt.edu/vtppestoconsumerpse](https://sites.google.com/vt.edu/vtppestoconsumerpse)), 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 524 total pageviews (98% were unique visitors) in 2024.

**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 2024, The Larry the Label and Hokie BugFest accounts had total reach of 1,647 and 11,703, respectively.