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## 2025 Private Pesticide Applicator Training

New rules effective January 1, 2025, require farmers and ranchers to complete a more comprehensive training program to obtain a license. The core private pesticide applicator training (category 20) will allow producers of agricultural commodities to “use” restricted use pesticides (RUPs) on owned and rented property. Anyone (family members, employees) who handles RUPs, including mixing, loading, applying, disposal of the product or container, and cleaning spray equipment must have a valid license.

One significant change affecting all applicators, even those with a valid license obtained prior to 2025, eliminates the option to supervise the use of RUPs by unlicensed workers or family members. “Use” includes mixing, loading, or applying any pesticide; cleaning pesticide equipment; or storing or disposing of pesticide containers, pesticides, spray mix, equipment wash waters, and/or other pesticide-containing materials. Immediate family members ages 16 or 17 can obtain a provisional private applicator license in category 20 which allows mixing and applying most RUPs but not purchasing. Upon turning 18 the provisional license will become a regular Category 20 private pesticide applicator license.

In addition to the core training, three new categories have been developed for applicators who need to purchase and use soil fumigants (category 21), non-soil fumigants including grain bins (category 22), and make aerial applications including airplane, helicopter or drone (category 23). Additional training must be completed for these categories.

There are two options for obtaining a category 20 license which do not require passing an examination. Producers may attend an in-person core training or take a self-paced online course. Information about the online course can be found at: <https://extension.missouri.edu/courses> and search for private pesticide applicator training. A fee of \$75 will be charged for either of these options. In addition to the Category 20 training, the additional category trainings are available online and in-person. There will be no additional charge for these training programs.

Producers who prefer to take an examination can find information about testing sites on the Missouri Department of Agriculture website at: <https://agriculture.mo.gov/plants/pesticides/>. Scroll down and click on the “Certification and Licensing” heading and then the “Private Applicator” subheading. Examinations for categories 20, 21, 22, and 23 are available. There is a \$45 charge per exam. No license will be issued until the category 20 exam has been passed.

Visit the MU Extension events webpage to locate in-person training classes: <https://extension.missouri.edu/programs/pesticide-applicator-training/ppat-training> locate the event and complete the registration.

For more information contact a Field Specialist in Agronomy at local a MU Extension office.

**Source:** *Valerie Tate, agronomy specialist*

## Low Pressure Ground Sprayer Calibration Considerations

*Continued article from last month's (January) issue.*

To determine pattern uniformity and to check for proper boom height, it is possible to spray water onto a light colored, warm, dry surface and observe drying patterns. Observance of extra runoff in certain strips or extended or decreased drying times of certain strips are good indicators of improper nozzle overlap or pattern uniformity imperfections due to nozzle wear or improper boom operating height. When working with 20-inch spaced nozzle tips use a 1:1 ratio of nozzle height above crop or weed canopy to nozzle spacing to achieve 100% overlap. One hundred percent spray overlap means 50% of the width of the spray pattern of one nozzle will line up with ½ of the spray pattern of the nozzle(s) directly adjacent to it is desirable and can be observed by raising and lowering the boom and observing the spray overlap. The edge of one nozzle's spray fan should meet at the middle of the nozzle spray pattern of the nozzle(s) directly adjacent to it.

The boom height to achieve this level of overlap typically corresponds with a 24–28-inch height above crop canopy or the ground for 20-inch spaced tips. Pattern width should be twice nozzle spacing width to achieve 100% overlap, which means that a 40-inch-wide spray pattern per nozzle should be observed on the ground when making an application utilizing 20-inch spaced nozzles. Nozzle manufacturers will often provide optimum boom operating heights for different nozzle tip products. Assuming a fixed effective spray width (W) which equals the nozzle dead center spacing, only ground speed traveled and nozzle output based upon orifice size and pressure can be adjusted to achieve the desired GPA application rate.

Gallons per acre is determined by multiplying the constant 5940 by the GPM output rate of the nozzles and then dividing this value by the product of multiplying the travel speed by the effective spray width (W) or nozzle spacing.  $GPA = (GPM \times 5940) / (MPH \times W)$

To determine needed GPM per nozzle if desired GPA, travel speed and effective spray width is known, simply divide the product of the multiplication of GPA, W, and MPH by 5940. Desired droplet size and application rate being known will make operating pressure and nozzle selection straight forward. Keep in mind, pressure variation is only good for minimal GPM and GPA changes.  $GPM = (GPA \times MPH \times W) / 5940$

To double nozzle output, pressure must quadruple. Quadrupling the pressure will lead to greater spray drift and can cause application pressures to exceed nozzle manufacturer specified operating pressure parameters. When running low application pressures, droplet size

will be larger, reducing drift potential, but operating below manufacturer specified operating pressures will lead to poor application uniformity and output will be sporadic if pressure is below the required pressure needed to open the nozzle body diaphragm. When looking to make significant changes to GPA and GPM outputs, always look to modifying ground speed and nozzle selection. Ground speed accuracy is a very important parameter to understand.

When ground speed doubles, application rate decreases by half, and when halving ground speed, application rate doubles. Ground speed operation typically follows 3-8 miles per hour (MPH) for pull type boom sprayers, 5-12 MPH for self-propelled boom sprayers, and 10-20 MPH for floaters and truck type application equipment. As speed increases above 10 MPH, drift likelihood increases due to the formation of a spray plume.

Flow rate controllers, GPS and radar-based speed measurement systems and pulse width modulation of nozzle duty cycles can simplify addressing ground speed related issues for the applicator, but these systems are costly and not every sprayer is equipped with such technology.

Some equipment may only have a tachometer and not have a speedometer and if a speedometer is present, it can be off and will not be as accurate in determining actual ground speed as other methods simply due to the effects of wheel slip when traveling across a surface. Actual ground speed should always be determined to correct for inaccuracies in speedometer readout. Speedometers can be recalibrated. Tire inflation pressure should be kept within manufacturer specification and maintained at the inflation pressure at the time of calibration.

To determine actual ground speed, determine the time it takes a loaded sprayer operating at engine rpms which are set based upon the desired sprayer operating pressure, to cover a given distance. Given distances for speed determination is 100 feet for up to 5 MPH, 200 feet for up to 10 MPH and 300 feet for speeds above 10 MPH. Keep in mind that 1 MPH is 88 feet per minute. Ground speed (MPH) can be solved for by dividing the product of the known travel distance (D) and 60 by the product of the average time in seconds it takes to travel between stakes (T) and 88.  $Speed (MPH) = (D \times 60) / (T \times 88)$   
The average of two trips across the calibration distance is adequate for true speed determination. When a sprayer only possesses a tachometer, gear and range selection as well as engine rpm should be recorded for future use to achieve desired operating speeds and application rates.

**Source:** [\*Nick Wesslak, agronomy specialist\*](#)

## Winter Care of Small & Backyard Flocks

Maintaining a small poultry flock is growing in popularity. Backyard flocks can provide eggs, meat, and an opportunity for all family members to participate and learn animal care. Concerns over animal care occur during the two extremes of weather, the heat of summer and the cold of winter. Most poultry can tolerate very low temperatures as long as they are kept dry and provided a wind block. Down feathers cover adult birds as well as chicks, which are used for insulation. The feathers are fluffed up by the adult bird, trapping air underneath to increase the insulation provided by the feathers. While most poultry can tolerate low temperatures, below are some ways to help protect the backyard flock during the winter.

### Housing

Insulation is usually not required in Missouri and can even be detrimental. Insulation can decrease ventilation, leading to a buildup of condensation and increased moisture inside the house. Ventilation is very important for the removal of carbon dioxide and the reduction of moisture levels. Insulation also encourages rodents to take refuge. However, if there is extreme low temperatures (-20°F) forecasted for an extended amount of time; temporary insulation should be considered.

Heat lamps are not recommended inside the house as they can be a fire hazard and cause temperature changes from one area of the house to another which can increase morbidity. Heat lamps can be used if the temperature is below zero for a long period of time. If a heat lamp is used, red heat bulbs are suggested instead of white heat bulbs to decrease potential cannibalism.

Bedding inside the house should be kept as dry as possible. Wet bedding increases the ammonia levels inside the house. Wet and caked material should be removed and dry bedding added as needed. Any absorbent material that decreases moisture and serves as an insulating material during cold weather can be used if it is clean, mold free and dry but not dusty. Pine shavings, rice hulls, peanut shells and ground corn cobs are all good products to consider. If housing laying hens, pine shavings should be avoided due to an off flavor in the eggs reported due to the consumption of pine tar. Note, hardwood shavings sometimes produce a mold which can cause a serious infection when inhaled by the birds.

Perches inside the house can also help the birds stay warm by allowing birds to get off the floor. Perches should preferably be made of wood.

Feather pecking can increase if birds are used to going outside and then restricted to inside due to cold weather and can lead to cannibalism. Producers can add items to

prevent or treat this problem, such as:

- ▶ Hay bales for the birds to scratch around in - Make sure to remove the string and confirm the hay does not contain mold. Mold can produce mycotoxin, which can remain in the house after the mold is removed.
- ▶ Cabbage or apples on sticks - It is important to remove any uneaten food particles to decrease spoilage.
- ▶ Old CD's and/or DVD's can be hung from the ceiling. Chickens will peck at the light reflections from the CD's and DVD's.
- ▶ Empty soda cans containing pebbles may also be hung from the ceiling to add entertainment.

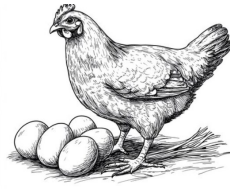
### Outdoor Runs

Most poultry will venture into the snow if it is not too deep. If the snow is deep, producers should shovel an area outside to encourage birds to venture out of the house. There are some concerns when poultry go outside; such as incidences of frost bite on toes and feet. When feet thaw, blistering can occur, which can burst open leaving open sores. If frostbite is severe and a foot is lost, humane euthanasia is recommended. For less severe cases, lotions and antiseptics can be used. Vaseline can be applied to the feet and combs of birds to help prevent frostbite; however, this is not practical for large flocks. Outside runs should have plastic wrapped around a major portion to block the wind. Wind ruffles the feathers decreasing the birds' ability to hold in heat. Significant wind chill can increase the incidence of frostbite and bird mortality. Runs should be kept as dry as possible with bedding added to areas of high traffic, such as the entrance to the house and around feeders and waterers.

### Nutrition

Poultry have an increased energy demand during the cold weather due to the energy expended for body temperature maintenance. It is best to provide a high quality, commercially prepared feed; which is available for specific ages and types of birds. Processing feed into pellets or a crumble form increases the cost over mash form; however, it also increases palatability and usually decreases feed waste. Supplementing the diet with scratch grains, such as cracked corn in the afternoons can be beneficial. Table scraps, including stale bread, leafy vegetables and peelings can also provide variety while decreasing feed cost. Producers should limit treats to what can be eaten within 10-20 minutes. Treats should be given in the afternoons to encourage birds to eat the balanced diet first. Egg shells are a good source of calcium, but should be crushed to prevent egg eating habits, if they are going to be fed back. Water is essential to bird health, and thus fresh, clean water should be available continuously. Waterers and feeders should be moved to new locations regularly to prevent caking and wet areas inside and outside the house. Commercial heated waterers or heated platforms are available.

Aquarium heaters placed in buckets with nipple drinkers also work and can decrease water waste as well.



### **Laying during the winter**

Poultry come into lay with increased day length and go out of lay with decreased day length. Producers must decide if they want their flock to remain in lay during the winter, or the birds to rest. To keep birds in lay through the winter, supplemental light is needed to provide 14 hours of light/day. Do not go over 16 hours of light/day as this can induce cannibalism. The extended day length can be added in the morning or evening. Egg collection should be done at least once a day.

Backyard flocks can be rewarding for all members of the family. With a little extra care and attention poultry can thrive during the winter. More information can be found at <https://articles.extension.org/poultry> or by contacting a University of Missouri Extension livestock specialist.

**Source:** *Heather Conroe, livestock specialist*

## **Upcoming PPAT Trainings**

To register for any of the classes below call 660-895-5123. Leave a message with your **name, phone number** and **location** you plan to attend. Additional locations will be in the next newsletter.

**Putnam County** - Feb. 1 @ 1 p.m. Old Soldiers Room, Courthouse, 1601 Main St. Unionville

**Adair County** - Feb. 19 @ 1 p.m. MU Extension Office, 503 E. Northtown Rd., Kirksville

**Macon County** - Feb. 21 @ 1 p.m. MU Extension Office, 111 N. Rollins St., Macon

**Linn County** - Feb. 25 @ 1 p.m. MU Cornett Farm, 21262 Genoa Rd., Linneus

**Randolph County** - Feb. 26 @ 1 p.m. MU Extension Office, 509 W. Reed St., Moberly

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**Northeast Missouri  
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