Importance of fertilizer spreader and sprayer calibration and maintenance

By Mongi Zekri, Steve Futch and Ryan Atwood

FERTILIZER SPREADER CALIBRATION AND MAINTENANCE

Properly calibrated and maintained equipment ensures a more uniform distribution of nutrients. Combined with other conservation practices, calibration reduces production costs and nutrient movement to nearby surface waters. Spreaders that have not been properly maintained and calibrated will have problems delivering accurate rates and evenly distributed fertilizer amounts to the grown crop. The amount of time required to correctly maintain and calibrate a spreader are minimal compared to the amount of money that can be lost by incorrect rates of application.

Spreader calibration

Calibration is the process used to help ensure that the equipment applies proper rates of the selected product. Proper calibration is the key to successful fertilizer use efficiency. Failure to calibrate equipment can result in ineffective applications. Applying too much is costly, unlawful and may cause crop injury. Applying too little can result in poor crop growth and production.

It is important to calibrate equipment on a regular basis to compensate for variations and equipment changes or wear with time. The equipment will become worn or damaged with use and result in inaccurate output and spread pattern. It is wise to conduct regular servicing of spreaders to ensure they are in good working order.

Three items must be considered when calibrating a spreader. The first is the distribution pattern of the spreader. This represents the amount of area that will receive the fertilizer. The second is the product application rate, which is the amount of product applied per acre. Third is the speed at which the equipment moves through the field.

There are multiple factors affecting the distribution pattern of a rotary spreader, and some of them relate directly to the type of applied product. For this reason, it is recommended that the spreader be calibrated separately for each individual product to be applied. Spreader calibration should be checked more often when the spreader is used frequently.

Product and application

Choose a product according to the need of the crop. Before applying the product, read the spreader manual. The spreader manual will usually indicate proper settings for various application rates. However, calibration still needs to be performed to ensure the settings are accurate and to compensate for wear and variations in equipment and product. Be sure that the proper procedures and application rates are followed. Check the ‘spread pattern’ and amount of the product being applied to the treated area.

The physical properties of dry fertilizer can vary widely. Since larger particles are thrown farther than small particles, a product of uniform size should be used to achieve a consistent application pattern. It is essential to maintain a constant speed when using a rotary spreader to obtain uniform and accurate distribution.

Failure to calibrate spreaders can result in ineffective fertilizer applications.

Maintenance and cleaning

Proper care and maintenance will help retain precise applications and prolong the life of spreaders. Manufacturers' directions on cleaning and lubricating should be followed. With the shutter or gate wide open, remove all granules from the spreader at the end of each application. Then, the spreader should be thoroughly washed and allowed to dry. Hot water may help break loose fertilizer which is caked on. Finally, lubricate the spreader according to instructions. Spreaders should be stored in a clean, dry place out of direct sunlight.

SPRAYER CALIBRATION AND DRIFT CONTROL

Sprayers must be checked to ensure all nozzles are applying pesticides uniformly and at the correct rate. Make sure your equipment is working properly and calibrated to ensure the correct amount of pesticide is delivered to the target area.

Pesticide application greater than the label rate is illegal and can result in needless risk to groundwater, increased production costs and/or crop damage. Under-application might be costly by not properly controlling the target pest. Although you can repeat the application, doing so is time-consuming, costs more, and increases the risk of applying too much and increases the risk of pesticide resistance.

Regular sprayer calibration includes measuring the output of all nozzles to ensure they are functioning properly. Specific calibration guides are available from a number of sources including the equipment manufacturer. Sprayer calibration should be done each time a different pesticide is applied or at least once each application season.

The rate of application depends partly on the particle or droplet size, texture and other properties of the pesticide mixture being applied. Use only water during the test if the pesticide is a liquid. Contact the manufacturer to get reliable information regarding carrier material to perform the test if the pesticide is a dust, granule, fumigant or a liquid diluted with a liquid other than water.

Follow calibration and mixing instructions carefully. Mixing, loading and calibration methods must also conform to the speed of the application machinery. Moving too fast or too slow changes the rate of application.

Minimizing spray drift

Spray drift — movement of a pesticide through air during or after application to a site other than the intended site of application — is a challenging issue facing pesticide applicators. Complete elimination of spray drift is impossible. However, drift can be minimized by following these control measures:

1. Read and follow the pesticide label.
2. Select low or non-volatile pesticides.
3. Use spray additives following label guidelines.

4. Use large orifice sizes for spray nozzles to produce larger spray droplets that are less likely to drift.

5. Avoid high sprayer pressures, which create finer droplets.

6. Use drift-reduction nozzles.

7. Use wide-angle nozzles, lower spray boom heights, and keep spray boom stable.

8. Do not spray when wind speeds exceed 10 mph and when wind direction is toward sensitive vegetation or location.

9. Use a shielded spray boom when wind conditions exceed preferred conditions, but are still within acceptable application conditions.

10. Avoid spraying on extremely hot and dry days, especially if sensitive vegetation is nearby.

11. Keep good records and evaluate the results.

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WHAT'S SHAKIN'

A study done by Citrus Mechanical Harvesting and Abscission Program leaders Tim Spann and Michelle Danyluk, horticulturist and food scientist, respectively, at the Citrus Research and Education Center, shows that mechanically harvested citrus fruit loads had significantly more debris than hand-harvested loads.

Debris samples were collected from three different harvesting systems: hand-harvesting, continuous canopy shake and catch system, and the tractor-drawn canopy shake system during the 2007-08 and 2008-09 seasons. Fruit load samples were taken from Valencia and Hamlin oranges harvested during these periods. The same company owned both groves, so grove care was similar across both varieties. The study showed that the tractor-drawn system (Oxbo 3210) showed the most debris being collected.

The benefits learned from this study should aid in the development of debris-removal systems for mechanical harvesters. Go to http://citrusmh.ifas.ufl.edu/pdf/db/SpannHS2010Vol45No8.pdf to learn more about this study.

FDOC Targets Visitors and Residents with Florida Citrus Messages

By Ken Keck

You've probably noticed a decline in out-of-state license plates and shorter lines at your favorite restaurants as the snowbirds have returned north. Seasonal visitors and residents may be a slight inconvenience to those of us who live here full time, yet they are an important target for FDOC in-state marketing activities.

For example, 150,000 visitors were expected to visit the Interstate-75 Welcome Center during March and April this year. FDOC partnered with Visit Florida to reach this key audience by offering a chance to win a trip to Florida. During the 2-month promotion, Welcome Center visitors were encouraged to "Squeeze More Sunshine into Your Life" and guess the number of Florida orange squeeze balls inside a Mazda Miata. The winner will receive the car and a citrus-themed Florida vacation including a grove tour and citrus-inspired lunch. To drive traffic to the I-75 Welcome Center, FDOC and Visit Florida utilized popular social media channels like Facebook and Twitter, as well as Web sites.

FDOC and Visit Florida gave Interstate-75 Welcome Center visitors a chance to "Squeeze More Sunshine into Your Life" with a Florida vacation and Mazda Miata giveaway.

The Florida State Fair set new attendance records this year with more than 486,000 visitors, up 37 percent from 2010. FDOC debuted the new "Take on the Day" orange juice commercials, sampled fresh citrus and distributed informational literature in the Agriculture Hall of Fame building during the 12-day event. Florida citrus was featured at the Taste of Florida breakfast, the Woman of the Year in Agriculture luncheon and at the Governor's Luncheon.

Strategic in-state marketing programs allowed FDOC to deliver Florida citrus messages to target consumers in other states as well. Citrus-focused segments on the Tampa-based syndicated Daytime TV program aired in 74 markets nationwide, including Washington, D.C., Lexington and Savannah this spring. Segments informed viewers about "The Adventures of Captain Citrus" elementary education program and the "Creative Juices Challenge" contest for students. Chef Justin Timineri from the Florida Department of Agriculture and Consumer Services (FDACS) demonstrated recipes from the Florida Citrus cookbook and a fourth segment featured "Cooking for Kids with Florida Citrus." You can view the videos at http://www.floridajuice.com/videos.php.

FDOC continues to explore partnerships with FDACS, Visit Florida, the Florida Department of Education and other state commodity groups to combine resources and optimize marketing efforts. Florida citrus is an iconic symbol to visitors and residents alike. We want to help ensure the viable future of Florida citrus for generations to come.

The mission of the Florida Department of Citrus is to grow the market for the Florida citrus industry to enhance the economic well-being of the Florida citrus grower, citrus industry and the state of Florida. Ken Keck, Executive Director, can be reached at 863-537-3999. For more information, visit www.FDOCGrower.com

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