Volume 4
Issue
1 February
2014

PoultryPractices

Oklahoma Cooperative Extension Service

A newsletter for poultry producers and poultry litter applicators...

poultrywaste.okstate.edu

Editor's Column

This issue highlights the measurable improvements in water quality within the Illinois River watershed, as reported by recent research findings. For applicators, we provide an update to an on-going OSU nutrient application research study comparing poultry litter and equivalent rates of commercial fertilizer. Finally, we summarize a respiratory disease sometimes seen in commercial production, Laryngotracheitis (LT).

For publications, regulatory information, and upcoming classes, visit your local county Extension office or poultrywaste.okstate.edu where you can also obtain an electronic version of this newsletter.

Josh Payne

Phosphorus Declining in Illinois River

Josh Payne, Ph.D.

Area Animal Waste Management Specialist
OSU Department of Biosystems and Agricultural Engineering

Illinois River near Tahlequah, OK.

A recent study from researchers at the University of Arkansas highlights water quality improvements within the Illinois River watershed. Water quality concerns related to elevated phosphorus (P) concentrations in northeastern Oklahoma watersheds (Eucha Spavinaw and Illinois River watersheds) have been the focus of regional and national attention and have resulted in increased regulation and litigation. Researchers recently examined in-stream P concentration data spanning from 1997 to 2009 within the Illinois River watershed. Results showed that flow-adjusted P concentrations have been decreasing since 2003 in the Illinois River at Arkansas Highway 59, at Watts, Oklahoma and further downstream at Tahlequah, Oklahoma. These decreases are tied to the reductions in waste water treatment effluent P, which occurred in 2002. However, changes in agricultural management practices are also likely responsible for P reductions and include: exporting the majority of poultry litter outside nutrient sensitive watersheds, implementation of best management practices, strict regulations related to land application of manure and mandatory manure management education for poultry producers and manure applicators. The study also found that flow-adjusted P concentrations in Flint Creek, an Illinois River tributary, have been increasing over time until 2007, at which point a slight decrease in P concentrations was observed. This decrease was most likely due to reductions in waste water treatment effluent P concentrations discharged into Flint Creek beginning in 2007. It should be noted that long-term P trends in Flint Creek will impact long-term trends of downstream sites such as Tahlequah. Overall, it does look promising that P concentrations were decreasing in the Illinois River watershed and may continue to decline due to reductions in effluent P concentrations and continued improvements in agricultural land management.

References

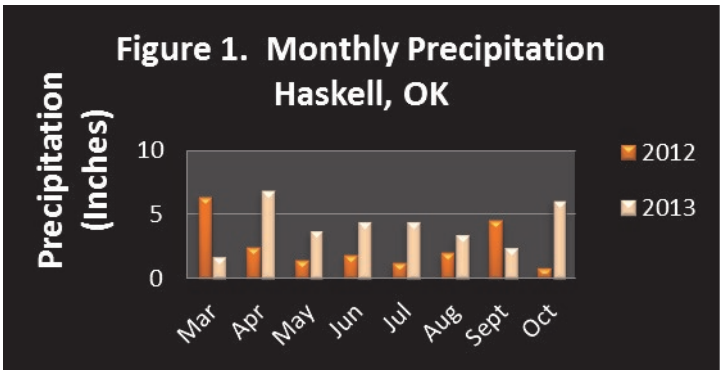
Scott, T. and B. Haggard, 2013. Phosphorus concentrations have been declining in the Illinois River: Was it point sources, farm-level nutrient management, or what? 2013 Waste to Worth Conference Proceedings. Available at: http://www.extension.org/

Nutrient Application Strategy Research Update

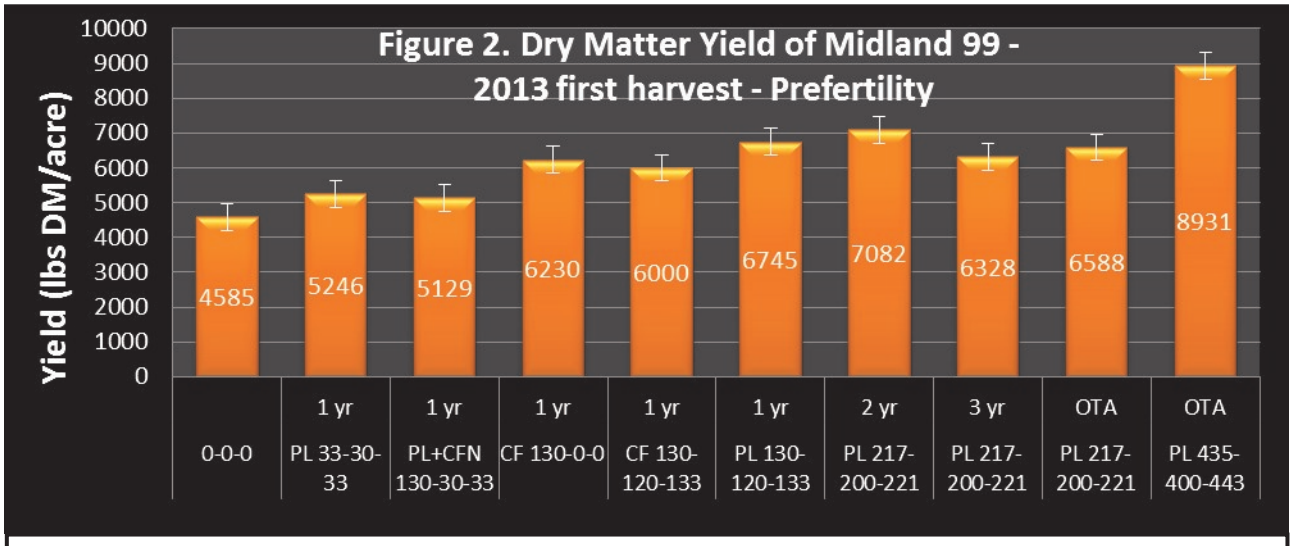
Brian Pugh

Area Agronomy Specialist
OSU Department of Plant and Soil Sciences

Last year marked the initiation of a long-term study to assess nutrient carryover in forages and directly compare poultry litter to commercial fertilizer applications. The first update article summarized data that illustrated the importance of fertility during drought conditions and how forage becomes more water efficient with proper fertilization. Results also indicated that forage stands were higher yielding, denser, healthier and less weedy under the use of fertility. All of this during drought conditions, nonetheless. The second year of data collection is complete and some of the results are included below. Rainfall data for both years is included in Figure 1. Growing conditions in 2013 were as close to ideal as possible throughout the summer. Treatments consisted of common agronomic rates of poultry litter (PL) and "nutrient equivalent" treatments of commercial fertilizer (CF) on an annual, two, or three year basis and were first applied on May 28, 2012. Annual treatments were re-applied on June 24, 2013.



Since treatments were not applied in 2013 until June 24, first harvest yields are an indicator of nutrient carryover from the previous years' application. Referring to Figure 2, it appears that both PL and CF elicited a yield increase one year after application. Following a drought with slow plant growth and reduced nutrient uptake, nutrient carryover is a possibility. However, fertility applications during the drought in 2012 also resulted in healthier Bermudagrass stands. This likely gave an advantage to 2012 fertilized plots by allowing advantageous use of available soil moisture at the beginning of 2013. Meanwhile, non-fertilized plots were still struggling to recover. There was a trend that as 2012 application rates increased, 2013 early season yield also increased.



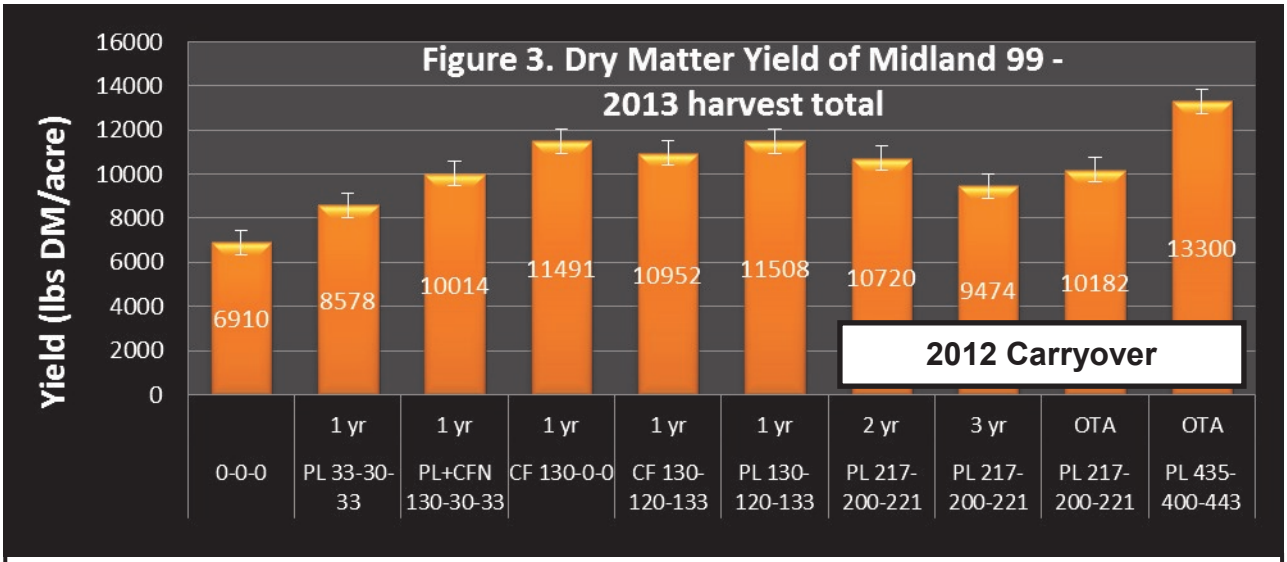
†Application timing; 1 yr = annual, 2 yr = every two years, 3 yr = every third year, OTA = One time application.

‡Nutrient rates are indicated as lbs nutrient applied/acre in terms of N-P-K, as PL = poultry litter or CF = commercial fertilizer.

Total forage production for the summer of 2013 was approximately twice the yield of each treatment in 2012, attributable to adequate moisture. Fertility applications made a large difference in potential yield of this Bermudagrass system (Figure 3).

The graph of 2013 total production sheds light on some important points to consider:

1. **Nutrient equivalent rates of N,P&K as poultry litter or commercial fertilizer exhibited similar yields.** This is indicating that a pound of N is similar regardless of source and matches the data we collected in 2012 during a dry year.
2. **Poultry litter applied once in 2012 to the threshold of 200 lbs P_2O_5/acre (3.33 tons/acre) when compared to an annual application of 2 tons/acre PL resulted in similar yields in both 2012 and 2013.** This indicates a potential to save 50% on application costs as long as proper nutrient management protocol is met.
3. **Carryover at some level exists since the highest rate applied last year was still the highest yielding treatment in 2013.** All 200 lb P_2O_5 application rates from last year were numerically very close to the current year's fertility treatments.
4. **The OSU rule of thumb that each 50 lbs of actual N applied adds 1 ton of forage is proving accurate**.



†Application timing; 1 yr = annual, 2 yr = every two years, 3 yr = every third year, OTA = One time application.

‡Nutrient rates are indicated as lbs nutrient applied/acre in terms of N-P-K, as PL = poultry litter or CF = commercial fertilizer.

These results are not finalized and future sampling will give us more data to boost confidence in the findings. Our plan is to utilize starting soil test values and "track" the amount of applied nutrients as fertilizer coupled with the removal of nutrients by plant uptake, and compare this back to ending soil test nutrients. This will give us a better understanding of the fate of applied nutrients in a long term forage production scenario.

This study is being conducted in conjunction with Dr. Josh Payne. Ongoing results from this study will be released as field reports when collected in the future.

Laryngotracheitis (LT) Overview

Josh Payne, Ph.D.

Area Animal Waste Management Specialist
OSU Department of Biosystems and Agricultural Engineering

Laryngotracheitis (LT) is a respiratory disease primarily affecting chickens that is caused by a herpes virus. The disease can affect any age of chicken and is considered highly contagious. The virus can be transmitted through airborne droplets when birds sneeze, cough or when they come into direct contact with each other. Natural entry routes for the virus include the upper respiratory tract and eyes. The virus may also be transmitted mechanically by contaminated equipment, humans, and manure that have been in contact with infected chickens. There is no evidence that LT is transmissible to humans.

Clinical Signs and Lesions

Most characteristic signs are found in adult birds and generally appear 6-12 days following exposure. Chickens with mild forms of LT show signs similar to other respiratory diseases such as watery eyes, swelling of eyelids and sinuses, sneezing, nasal discharge, unthriftiness, and decreased production. Clinical signs in more severe forms of the disease include open-mouth breathing, gasping for air, extension of the neck to facilitate breathing, and coughing of blood stained mucus which may cover feathers as birds shake their head to clear the mucus. Wheezing and rattling may be heard in "caller birds" exhibiting both symptoms and sounds. Upon necropsy, lesions are usually found in the trachea and larynx, manifested by excess mucus, hemorrhages, tracheal inflammation, and plugs of cheese-like material which may lead to suffocation. The severity of lesions dictates the length of disease; however, most chickens generally recover in 10-14 days.

Mortality

Depending on the severity of the strain, mortality rate may vary from 5-70% but normally ranges between 10-20%.

Diagnosis

In Oklahoma, LT is a reportable disease. Although clinical signs are useful, reliable diagnosis of LT requires a laboratory analysis by post-mortem examination and swabbing the trachea. Poultry growers should contact the Office of the State Veterinarian as well as their own company personnel if they have suspect birds.

Prevention and Control

Adhering to strict biosecurity standards is your best line of defense against LT. Examples include wearing protective clothing and shoe covers before entering a facility and limiting the flow of visitors and equipment entering the farm. If the disease does infect your flock, early detection is crucial in controlling disease spread. Since the incubation period is 6-12 days, vaccination may be given to the entire flock and adjacent flocks. Vaccination can result in "carrier" birds which may infect non vaccinated birds. Consequently, vaccination is recommended only when the disease is present within close proximity of the farm. The virus is readily destroyed outside of the host chicken by disinfectants and warm temperatures. Therefore, carryover from one flock to another can be controlled through proper cleaning and disinfection.

References

Clark, F. D., 2002. Infectious Laryngotracheitis. Avian Advice 4 (2):5-6. University of Arkansas Center of Excellence for Poultry Science.

Guy, J.S. and T.J. Bagust, 2003. Laryngotracheitis. *In*: Y.M. Saif, H.J. Barnes, J.R. Glisson, A.M. Fadly, L.R. McDougald, and D.E. Swayne, (Eds.), Diseases of Poultry, 11th Ed. Iowa State University Press, Ames, IO, pp.121-134.

Carver, D.K., 2008. Infectious Laryngotracheitis Virus (ILT). North Carolina Poultry Industry Newsletter, pp.2-4. North Carolina State University Department of Poultry Science.