

Spreading It On Too Thick

BY TOMMY NEWTON



Becky Gilfillen

AFTER FIVE YEARS OF RESEARCH, WKU AGRICULTURE SCIENTISTS BECKY GILFILLEN, TODD WILLIAN, AND BYRON SLEUGH HAVE LEARNED NOT TO SPREAD IT ON TOO THICK — POULTRY LITTER, THAT IS.

Spreading the litter too thick creates environmental problems and may not provide increased crop yields.

“What we have found is good news or bad news depending on who you are talking to,” Dr. Sleugh said. “It’s good news to those who are interested in environmental protection and environmental quality, but it is not such good news for a farmer who has a lot

of chicken litter to get rid of. What we found is that you don’t really need to apply a huge amount of poultry litter to get adequate yields and quality.”

How to handle the litter has become an issue in recent years as the poultry industry has grown across Kentucky. The management practices being developed at WKU will benefit farmers and the general public. “Overall we’re trying to find environmentally responsible ways to use litter as a fertilizer source,” Dr. Willian said.

The three faculty members have begun a second five-year research cycle with the U.S. Department of Agriculture. The first five years of research were conducted in conjunction with the USDA-Agricultural Research Service (ARS) unit at Mississippi State University. Now, the WKU researchers are working with the USDA-ARS unit at Bowling Green. The research and the USDA-ARS unit have been funded in recent years thanks to the efforts of U.S. Senator Mitch McConnell.

In their research, the WKU faculty members have applied varying levels of poultry litter to orchardgrass,

alfalfa, sorghum-sudangrass, tall fescue, and corn. One of the things learned in the first five years is that “when we apply litter at rates to meet the nitrogen needs of the plant, we see a phosphorus buildup,” Dr. Gilfillen said. “And it happened a lot faster than we were anticipating. You get soil test levels that are considered very high after two to three years of application when we had thought it would take ten years.”

In the new five-year cycle, the researchers have begun applying poultry litter at a lower rate and supplementing it with inorganic fertilizers to reduce the phosphorus

buildup and have begun looking at planting cover crops to remove phosphorus from the soil, she said.

Dr. Sleugh also conducted a litter rate application study on tall fescue, Kentucky’s most important forage crop. In the test plots, he applied no litter, one ton per acre, two tons per acre, three tons per acre, four tons per acre, and so on. “Looking at the data, you could get equivalent yield and quality by applying no more than about two tons of litter per acre, compared to what inorganic fertilizers would provide,” he said. “There’s no return on your investment if you go with four tons per acre, other than

getting rid of the litter. If you’re going to be buying litter by the ton, it’s not worth it to pay for and transport two extra tons of litter per acre, if you’re not going to see a benefit in the yield or quality of the crop you’re growing.”

Dr. Willian also had similar findings with corn. “There was no agronomic advantage to applying more than four tons per acre of litter to corn,” he said. “Almost universally across the different crops and species that we work with it’s the same. Just dumping it on doesn’t make sense. It doesn’t make economic sense and it doesn’t make environmental sense.”

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Photos by LaDonna Harmon



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The faculty members and students who work with them have presented their findings at numerous local, regional, and national conferences, as well as field days at the WKU Farm. The management practices are becoming more important as states look for ways to reduce environmental problems of animal waste. “The growth in the poultry industry has been phenomenal,” Dr. Sleugh said. “More birds mean more litter. More litter brings associated problems of managing, handling, and disposing of it.”

According to the Kentucky Agricultural Statistics Service, broiler production was just 1.5 million birds in 1990 but that number dramatically increased to 22.2 million in 1991 and has risen each year. Production was at 64.5 million in 1995, topped 110 million in 1997, and was 230 million in 2000. In 2003, production was at 275.9 million birds with a value of production at \$506.6 million. That ranked poultry at third in Kentucky’s top five farm commodities in 2003, behind horses and cattle and ahead of tobacco and soybeans.

With proper management, the waste material becomes a valuable recyclable resource, Dr. Willian said. “We feel we’re trying to take a proactive approach toward management practices that may be mandated in the future,” he said.

The issue has economic impacts not only for farmers who pay to transport or dispose of the waste, but for consumers who see those costs passed along, Dr. Gilfillen said.

“For centuries farmers have used animal waste as a source of nutrients,” Dr. Sleugh said. “In the last few years with the increase in the cost of inorganic fertilizers, primarily nitrogen, a lot of farmers have looked at going back to using some of these organic fertilizers. The cost of nitrogen is going up and chicken production in Kentucky is skyrocketing, so lots of litter has become available. It was good timing for the farmers.”

