



Poultry Housing Tips

Does Poultry Litter Contain Weed Seeds?

Volume 35 Number 9



2023

It is not uncommon to see weeds sprout after applying broiler litter to a field. As a result, it seems logical to conclude that there are weed seeds in the broiler litter. But, is this true?



Poultry litter is not like cattle manure or the droppings from wild or backyard birds. Ruminant manure can contain seeds that pass through the digestive tract from their forage. Likewise, wild birds and backyard flocks with free range to scavenge can pass seeds through their droppings. Broiler litter is comprised of predominantly of manure and bedding; neither should contain very many seeds. In fact, several studies have found that broiler litter does not contain viable seeds (Williams & Williams, 1994; McGrath, 2009). First, weed seed contamination of grain is typically low at 1.9%. We then crush, mill, steam, and pelletize the grain, destroying those very few weed seeds that might have been incorporated with the grain. Bedding materials like shavings, peanut hulls, or rice hulls would not normally contain any weed seeds. Technically, weeds could be introduced into a stack house through wild animals and/or by seeds being carried by the wind, but these seeds are in such small amounts that they can rarely be identified. So where do these weeds come from

after applying litter?

All soils contain dormant seeds unless sterilized. Studies have shown depending on location and soil conditions there can be between 50-15,000 seeds per square foot of soil waiting to germinate (Figure 1). It is in the genes of weeds to sprout in favorable conditions and out compete the plants around them. Many weed seeds can lay dormant for over 50 years. An ongoing study from Michigan State has shown that mullein seeds can last over 100 years in the ground. Most of the grasses grown in pastures are domesticated perennials that grow slower and need maintenance. Most weeds are wild annuals; that means they germinate, mature, then set seed and distribute thousands of seeds sometimes twice as fast as the forage crop (Figure 2). So, when we apply poultry litter to a field, we are stimulating dormant seeds to germinate.

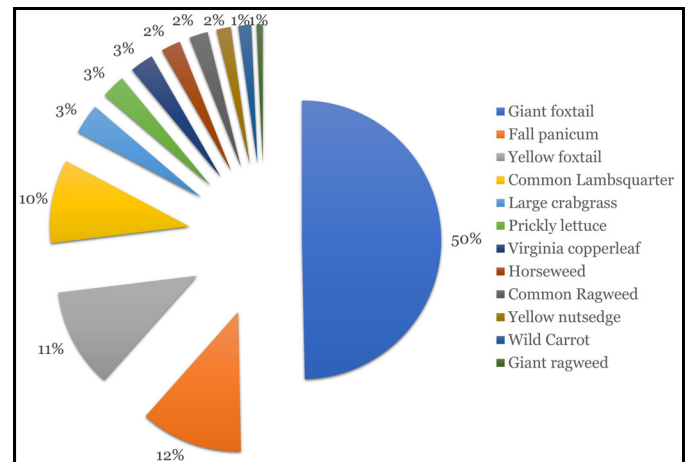


Figure 1. Example of dormant weed seed profile in soil

So why exactly does poultry litter stimulate germination? We apply litter to our fields as a source of plant nutrients. Litter provides the “big three”: nitrogen, phosphorus, and potassium, as well as the micro-nutrients that are still essential to plant

growth, like calcium, magnesium, sulfur, etc. Seeds do not spontaneously germinate, they germinate when the conditions are right for the plant to grow and reproduce. Inevitably, many seeds are driven to germinate simply because there is higher soil fertility after litter is applied. Poultry manure also contains organic acids which are continually made as the manure decays. The dormant seed coating can be weakened by these organic acids, leading them to germinate.



Figure 3. a.) Potting soil. b.) Potting soil with seeds. c.) Potting soil mixed with broiler litter. d.) Potting soil mixed with broiler litter and seeds

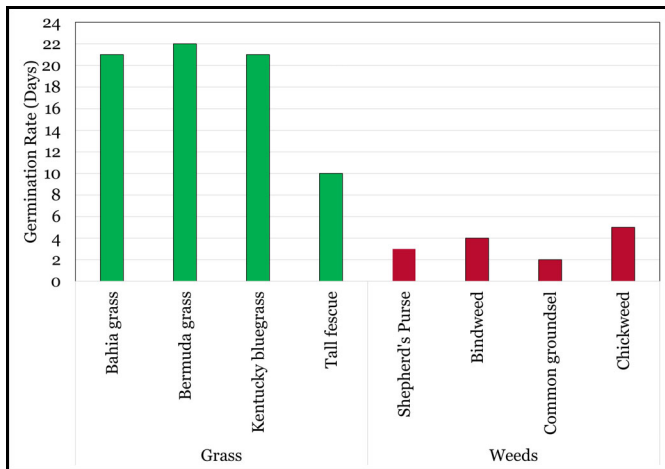


Figure 2. Germination rate of typical weed and grass seeds

Inevitably, weed seeds sprout in pastures due to the presence of higher fertility and organic acids, not because there are weed seeds in poultry litter. If you are on the fence about all this, test it by mixing commercial poultry litter in some sterile potting soil and then watch what grows.

A simple demonstration was conducted to investigate the theory that litter does not contain seeds (see Figure 3). Four cups were used in the demonstration. Two cups were filled with sterilized potting soil, and two cups was filled with sterilized potting soil and broiler litter (representing an application rate of 30 tons per acre). Mustard seeds were planted in one cup with the sterilized potting soil and one cup with the litter potting soil mixture. The results were intriguing: the cups without any introduced seeds did not show any signs of growth. However, in contrast, the cups containing mustard seeds, whether in potting soil or the soil/litter mixture, exhibited successful germination. In summary, the demonstration confirmed that litter alone may not contain viable seeds. Nevertheless, when viable seeds were introduced into the potting soil or the soil/litter mixture, they demonstrated successful germination.

In the end, poultry litter is a good source of primary and secondary plant nutrients. Additionally, poultry manure adds organic matter and beneficial microorganisms that improve soil health. Good pasture, grazing, and weed management should be utilized when using both commercial fertilizers and poultry manure. We shouldn't be afraid to spread poultry manure on fields for fear of weed seeds.

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McGrath, S. R. (2009). Poultry Litter as a Nutrient Source for Low Input Forage Systems (Doctoral dissertation, Virginia Tech).

Mitchell, C.C., R.H. Walker, and P.P. Shaw (). Are There Weeds In Broiler Litter? Highlights of Agriculture Research (Alabama Agriculture Experiment Station, Auburn University, AL36849).