

Land Application of Cranberry Presscake 3 Years of Experimentation

Stephen Herbert and Thomas Akin
Department of Plant and Soil Sciences
University of Massachusetts

For the past three years, the University of Massachusetts has conducted research on the economic and environmental viability of land application of cranberry presscake, a food processing residual from the juice extraction process. The cranberry industry generates a sizeable amount of cranberry presscake which until recently was disposed of in landfills. Cranberry presscake is fairly acidic, with pH values between 3.0 and 4.0. Presscake is approximately 50% dry matter and low in nitrogen, approximately 1.0% on a dry weight basis.

Experiments were completed both at the University Experiment Station and on-farm in Middleboro, MA with the cooperation of local dairy farmers. Field experiments with field corn began at the University Experiment Station in 1991 to measure the effect of increasing rates of cranberry presscake application on corn silage yields. Five rates of presscake (0, 10, 25, 40, 50 t/ac) were applied with 5 rates of nitrogen (50, 110, 200, 290, 350 lb. N/ac), and 5 rates of lime (0, 400, 1000, 1600, 2000 lb. lime/ac).

In 1991, plots which received the highest rate of presscake experienced a slight yield depression for silage, however, earcorn yields remained fairly constant across treatments. In 1992 and 1993, the experiment was repeated on the same plots; in 1992 the yield reduction for silage was more pronounced as presscake application was increased, but again there was no significant difference among treatments for earcorn yield. In 1993, silage yields remained fairly constant even at the higher rates of presscake (Figure 1). Liming had little influence on yield, and yield was not increased with nitrogen rates higher than 200 #N/acre. The organic matter from the addition of presscake may have helped to conserve soil moisture during the drought of 1993. June 1993 soil nitrate levels were depressed slightly with increased rates of presscake application (Figure 2). Throughout the three years of the study, soil pH levels rose slightly with higher rates of presscake, probably due to the increased buffering capacity from the added organic matter.

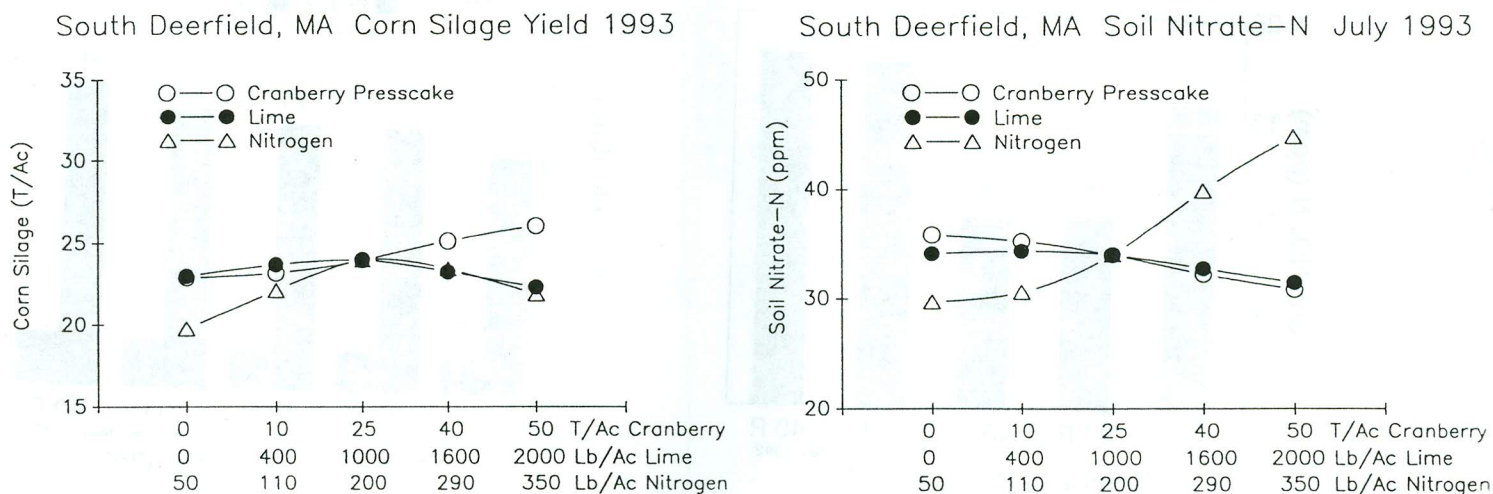
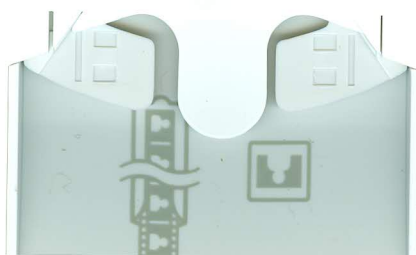


Figure 1. 1993 corn silage yield. Figure 2. June 1993 Soil NO₃-N levels.



The Middleboro on-farm experiment with cranberry presscake application to field corn, began in 1992. Two different forms of the presscake residue (with and without ricehulls) were applied at the rates of 0, 20, 40 t/ac, with two levels of nitrogen (80 lb. N at planting plus either 50 or 100 lb. N/ac at sidedressing). Plots receiving higher rates of ricehull/presscake residue had significantly lower levels of NO₃-N (Figure 3). At harvest, these plots also had lower silage yields (Figure 4). In 1993 the experiment was repeated, however, only the presscake with ricehulls was land applied. Plots that received the presscake without ricehulls in 1992, had higher soil nitrate levels in June 1993 (Figure 5). Corn silage yields in 1993 were not depressed by the addition of presscake (Figure 6). Also, there were no adverse residual effects to corn from the 1992 land application of cranberry presscake (Figure 6).

There appeared to be no negative long term effects of land application of cranberry presscake to corn land. We feel confident that the application of presscake to corn land will have no adverse effects as long as soil nitrate levels are monitored closely by the farmer.

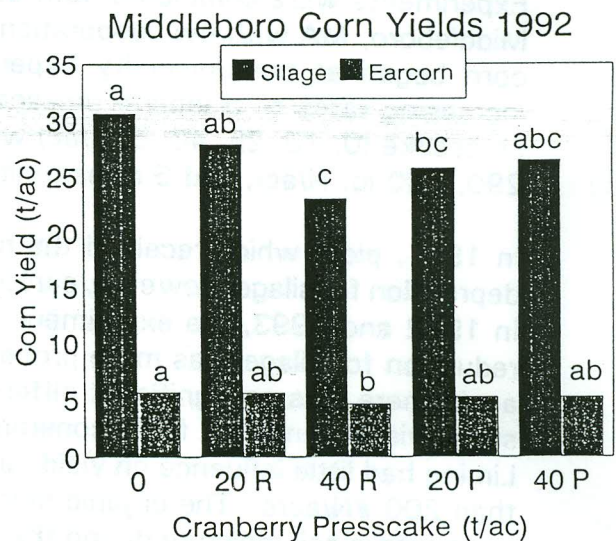
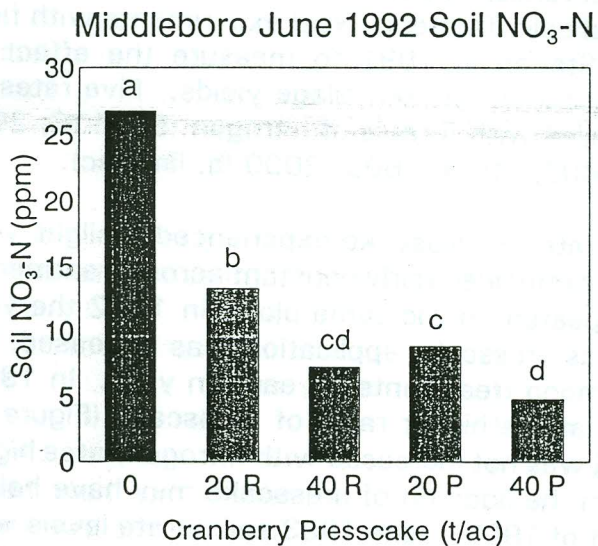


Figure 3. Middleboro Soil NO₃-N June 1992. Figure 4. Middleboro 1992 corn yields.

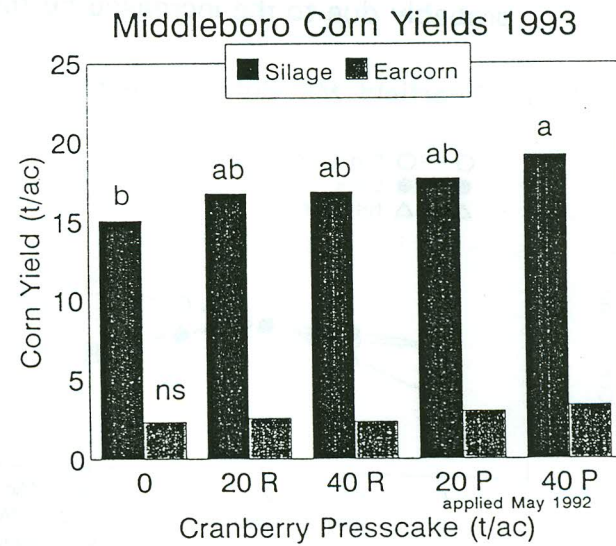
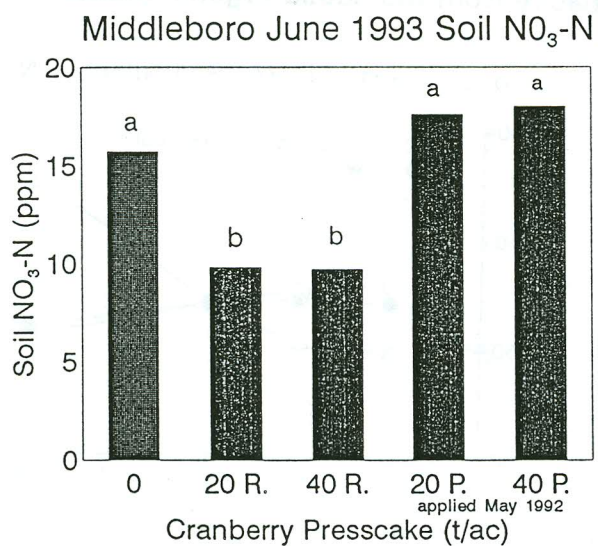


Figure 5. Middleboro Soil NO₃-N June 1993. Figure 6. Middleboro 1993 corn yields.

