

EFFECT OF SWINE LAGOON WATER APPLICATION RATE AND ALFALFA HARVEST FREQUENCY ON DRY MATTER PRODUCTION AND N HARVEST

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ABSTRACT. Swine (*Sus scrofa domesticus*) lagoon water can supply valuable fertilizer nutrients for field crops. Reduced land availability and increased swine operation size can potentially create situations where swine producers may over-apply lagoon water and contaminate groundwater. This study was initiated in fall 1992 at the Haskell Agricultural Laboratory near Concord, Nebraska, on a Blendon sandy loam (coarse-loamy, mixed, Pachic Haplustoll). The objectives were to determine how harvesting alfalfa three times per year (3-HF), four times per year (4-HF), or five times per year (5-HF) and swine lagoon water application rate affected dry matter production and nitrogen (N) harvest by alfalfa (*Medicago sativa* L.). Swine lagoon water from an anaerobic lagoon was applied to alfalfa using a line-source sprinkler system at rates of 14, 109, 239, 394, 509, and 634 kg N ha⁻¹ in 1993 and 14, 114, 249, 399, 519, and 644 kg N ha⁻¹ in 1994. In 1993, alfalfa dry matter production increased linearly with increasing lagoon water application rate. In 1994, lagoon water application of 644 kg N ha⁻¹ significantly increased dry matter production by 1.9 Mg ha⁻¹. Dry matter production averaged 19.2, 22.5, and 21.5 Mg ha⁻¹, for the 3-HF, 4-HF, and 5-HF treatments, respectively. Nitrogen harvest increased linearly with lagoon water application rate in 1993 and 1994.

Keywords. Alfalfa, Harvest frequency, Swine lagoon water, Sprinkler irrigation, N application.