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.