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Fertility management of organic sweet corn production on sandy soils

Test conducted by:

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Introduction and procedures

This research team conducted a study of evaluating organic sweet corn production using early season manure applications alone and in combination with in-season feather meal applications. The study was conducted at the UW Hancock Agricultural Research Station (Waushara County) on overhead irrigated Plainfield loamy sand soil. Two early-season manure treatments were evaluated and included spring-seeded field pea and pelletized composed poultry manure (CPM, 4-5-3). The field pea green manure had 29 and 81 lb. N ac⁻¹ respectively in the two-year study. The CPM was applied at a rate of 68 lb. N ac⁻¹ (year 1) and 81 lb. N ac⁻¹ (year 2). Crumbled feather meal was broadcast applied in two equal split sidedress applications at the V4 and V8 sweet corn growth stages at 100, 150, 200 and 250 lb. N ac⁻¹.

Test results

Results underscored the well-known potential for N loss on sandy soils. Early season manure applications failed to increase yields when used alone, and failed to reduce N application in combination with feather meal. Lack of yield effect was likely due to rapid decomposition and deep drainage of N during rain events in year 1 and excessive irrigation in year 2. Feather meal was a suitable source of N when split applied at V4 and V8, resulting in sweet corn yields that equaled or exceeded conventional yields from concurrent studies. Optimal feather meal-N rate in year 1 was 200 lb. N ac⁻¹ with a yield of 8.3 ton ac⁻¹ (20,000 ears ac⁻¹). In year 2, 100 lb. N ac⁻¹ was the optimum feather -N rate with 9.6 ton ac⁻¹ yield (23,000 ears ac⁻¹), with no significant response to increased N rates. Seasonal differences and resulting water management differences are likely responsible for overall increased yield during the year 2 drought.

Conclusion

Feather meal derived fertilizer proved to be an effective organic nitrogen source at a wide range of rates (100 lb. N - 200 lb. N/a) during the two year study with yield increases that equaled or exceeded conventional yields from concurrent studies.