



Nutrients removed in harvested portion of crop by continuous corn receiving organic and inorganic fertilizers

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An accurate estimation of nutrient removed from soils in the harvested biomass portion of corn (*Zea mays* L.) crop is essential for sustainable nutrient management because nutrient removal by plants is an important step in developing fertilizer recommendations using potential yield. Crop nutrient values that were developed by Ontario Ministry of Agriculture and Food based on historical averages might need to be completed under current agronomic practices. A study was conducted to examine patterns of macro- and micro nutrient accumulation in corn grains in response to seven different levels of N amendments: no amendments, fertilizer (NH_4NO_3) at 100 and 200 kg N ha⁻¹, stockpiled and rotted manure at 50 and 100 Mg ha⁻¹ (wet weight) application. Results indicate that over the study periods manure application increased most of biomass macro- and micro nutrient concentrations. There was no significant positive relationship between grain yield and macro- and micro nutrient concentrations. Data showed at 11 t ha⁻¹ yield level, corn grain would remove on average the following amounts of nutrient elements: N, 126.5 to 174.9; P, 31.9 to 35.2; K, 34.43 to 37.62; S, 12.21 to 14.96; Mg, 10.08 to 10.65; Ca, 0.81 to 0.97; Fe, 0.24 to 0.33; Zn, 0.20 to 0.23; Mn, 0.048 to 0.054; Cu, 0.027 to 0.042 kg ha⁻¹, which are comparable to those reported in the literature: N, 120.8; P, 36.7; K, 44.7; S, 9.9; Mg, 14.4; Ca, 2.6; Fe, 0.33; Zn, 0.25; Mn, 0.045; Cu, 0.03 kg ha⁻¹. These values, however, do not take into account the quality and availability of nutrient reserves already in the soil. Because of this limitation, soil testing should still be the cornerstone of all fertility programs. Removal rates can be used in conjunction with soil testing to estimate the depletion of macro- and micro nutrient reserves. These data are very useful in comparing the nutrient demands of different crops.