عنوان مقاله:

Nitrogen management strategies for smallholder maize production systems: Yield and profitability variability

محل انتشار:

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خلاصه مقاله:

Maize (Zea mays L.) production requires large amounts of nitrogen (N) thatdirectly affect production cost. Poultry litter can be used as an alternative source ofN. To optimize its use, poultry litter requires technical and economic feasibilityanalyses. Crop simulation models have proven to be efficient tools to support thistype of research. The objectives of this study were to determine yield and net returnof maize production fertilized with both mineral fertilizer and poultry litter. Highinter-annual variation was observed in simulated yield for all fertilization strategiesevaluated. The higher the mineral N rate, the higher the yield. Among the treatmentsfertilized with poultry litter the highest yield was obtained with a rate equivalent to240 kg ha-1 of N. The trend of the economic net return for the different rates ofmineral fertilizers was in the opposite direction of the trend in yield, i.e., the higherthe rate of mineral fertilizer, the lower the economic return. Among the poultry litterfertilization strategies, the average economic net return increased up to a rateequivalent to 210 kg ha-1 of N, decreasing for higher rates. Poultry litter ratesequivalent to 120 to 300 kg ha-1 of N, economically exceeded all the mineralfertilization strategies that were evaluated. Among all sources and rates, the highestnet return was obtained for a rate of 210 kg ha-1 of N as poultry litter. Higher ratesprovided a lower net return and increased the likelihood of nitrate leaching.

کلمات کلیدی:

Poultry litter, crop modeling, DSSAT, Fertilizer management, Zea mays L, Economic analysis