



Influence of Conservation Tillage and Poultry Litter Application on Carbon Dioxide Efflux from Soil in Cotton Production Systems

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Results

Carbon Dioxide (CO₂) Efflux:

- No-till plots (NT) released 47 and 43.5% lower CO₂ than that of Conventional (CT) and Mulch till (MT) plots, respectively.
- NT can reduce soil CO₂ emission by 7.0 Mg ha⁻¹ when compared to CT system during the cotton growing season of about 165 days.
- Cotton-winter rye cropping system released significantly higher CO₂ (3.2 μ mol m⁻² s⁻¹) than that of cotton-fallow (2.1 μ mol m⁻² s⁻¹). This could be due to the availability of additional residue in cover crop plots.
- Plots receiving poultry litter released 22% more CO₂ than those receiving ammonium nitrate, yet, increased soil carbon levels by 11% in NT system.

Total Soil Carbon:

No-tillage system with 100kg N ha⁻¹ as poultry litter had 11% significantly more total organic carbon (0-90cm) than in conventional tillage at the same rate of N.

Conclusion

No-till conservation tillage system in conjunction with poultry litter application at the rate of 100 or 200 kg N ha⁻¹ promotes carbon sequestration in cotton soils.