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NH₃-N LOSSES FROM UREA ASSOCIATED WITH HUMIC ACID APPLIED ON BARE AND COVERED SOIL

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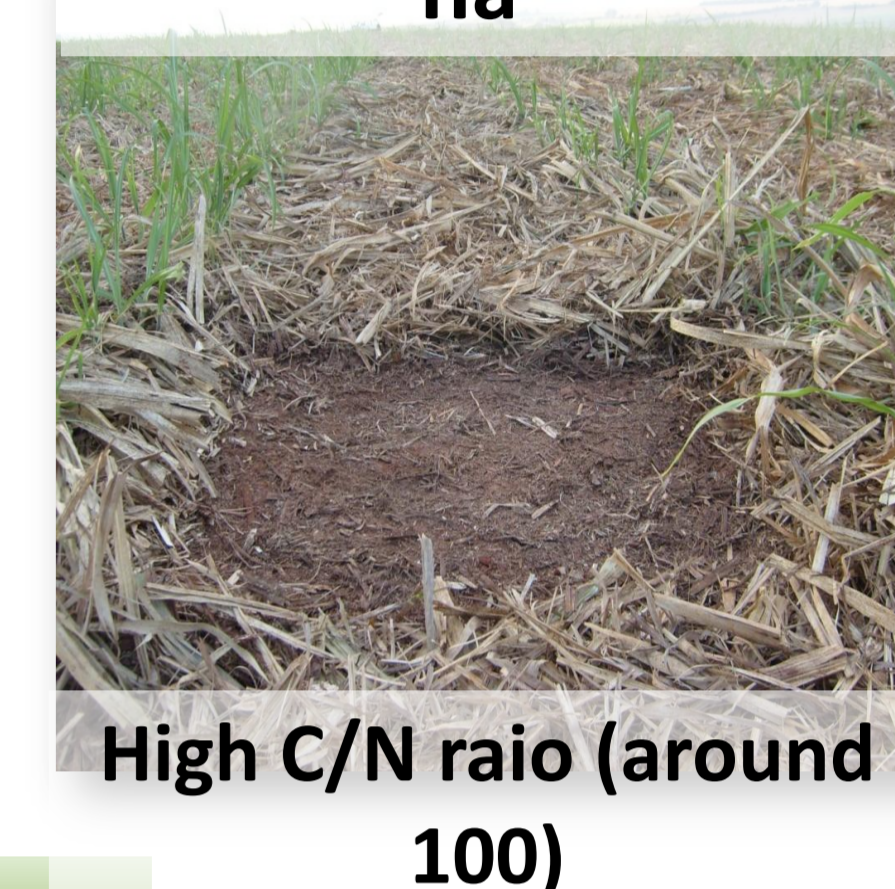
2- Center for Nuclear Energy in Agriculture, University of São Paulo, Piracicaba, SP, Brazil



INTRODUCTION AND OBJECTIVE

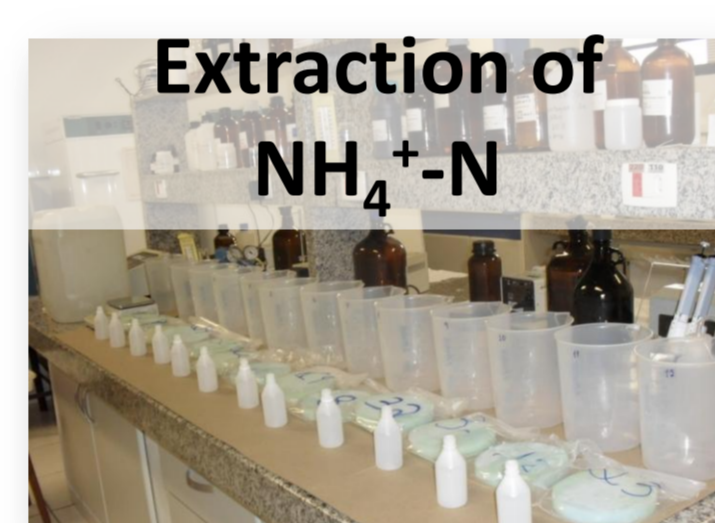
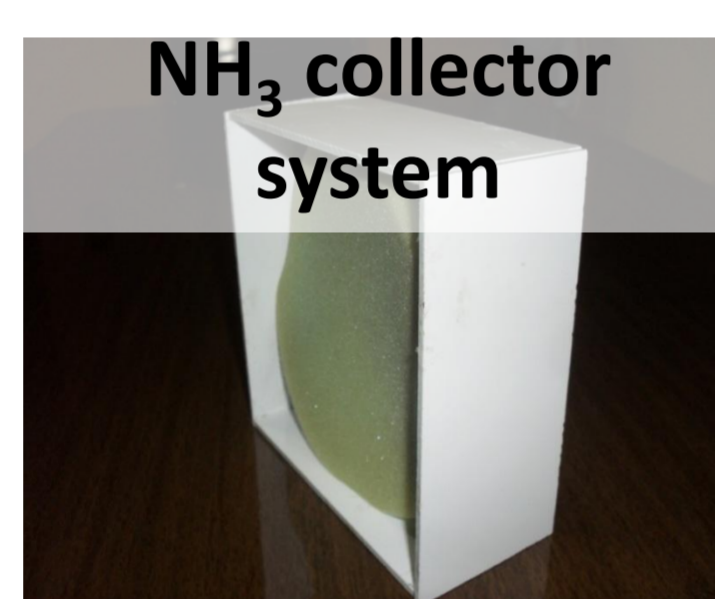
The unburnt sugarcane harvesting in Brazil produces large amounts of trash on soil surface, hindering the incorporation of fertilizers into the soil. When urea is the source of N, the NH₃ losses can reach 20 to 40 % of N applied over the trash blanket. This study aimed to quantify the NH₃ losses from urea-N applied in two forms: soluble urea (SU) and soluble urea + humic acid (SU + HA), and under two conditions: with and without sugarcane straw on soil surface.

Straw: 10 to 30 Mg ha⁻¹



High C/N ratio (around 100)

MATERIAL AND METHODS



NH₃ COLLECTOR SYSTEM: The foam absorbers used were previously soaked in 30 mL of orthophosphoric acid (0.5 mol L⁻¹ solution with 5 % glycerol - v/v).

TREATMENTS

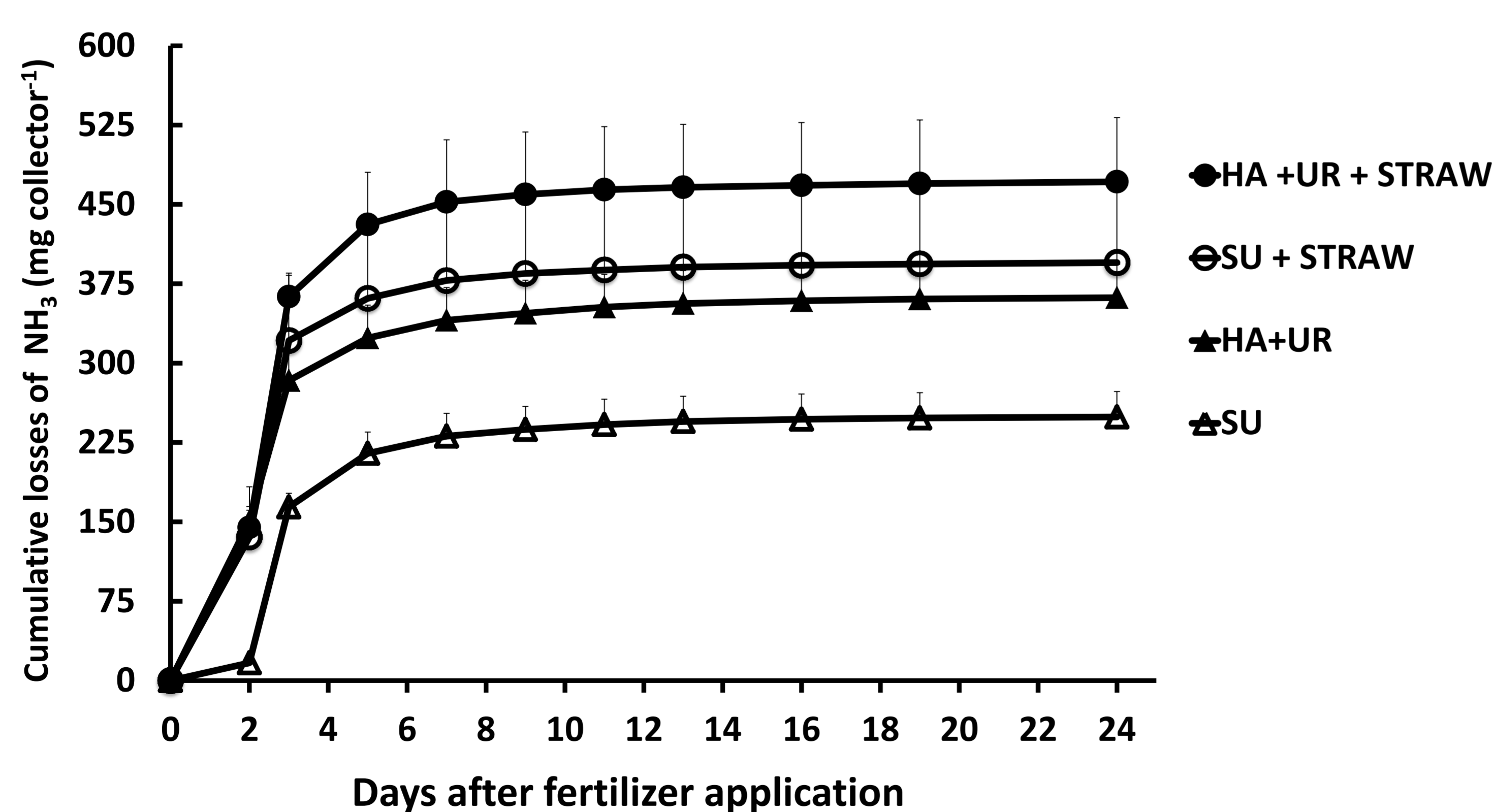
HA + UR + STRAW → application of HUMIC ACID + UREA in covered soil

SU + STRAW → application of SOLUBLE UREA in covered soil

HA + UR → application of HUMIC ACID + UREA in bare soil

SU → application of soluble urea in bare soil

RESULTS



Cumulative losses of NH₃-N (mg collector⁻¹)

| | Covered soil | Bare soil | Mean |
|-------------------|--------------|-----------|---------|
| HUMIC ACID + UREA | 471.4 Bb | 361.9 Ab | 416.7 b |
| SOLUBLE UREA | 395.1 Ba | 249.1 Aa | 322.1 a |
| Mean | 433.3 B | 305.5 A | 369.4 |

NH₃ volatilized (% of N applied)

| | Covered soil | Bare soil | Mean |
|-------------------|--------------|-----------|--------|
| HUMIC ACID + UREA | 64.1 Bb | 49.2 Ab | 56.7 b |
| SOLUBLE UREA | 53.8 Ba | 33.9 Aa | 43.9 a |
| Mean | 58.9 B | 41.6 A | 50.3 |

Means in each column and row followed by the same lowercase and capital letter, respectively, are not significantly different by Tukey's test (p > 0.05).

CONCLUSIONS

- ✓ The higher NH₃-N volatilization in the treatments with straw must have been favored by the higher urease activity in plant tissues than in soil.
- ✓ The use of soluble urea associated with HA did not reduce the loss of NH₃-N.

ACKNOWLEDGEMENTS

