

COMPARISON OF SLOW-RELEASE N SOURCES ON COOL-SEASON TURFGRASS – GROWTH RESPONSE AND N LEACHING STUDY UNDER GLASSHOUSE CONDITIONS



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Turfgrass Envirotron

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OBJECTIVES

- 1. TO DETERMINE THE GROWTH AND QUALITY RESPONSE INDUCED BY SLOW-RELEASE N MATERIALS ON COOL-SEASON TURFGRASS GROWING IN GLASSHOUSE CONDITIONS**
- 2. TO DETERMINE THE N LEACHING POTENTIAL OF THE SLOW-RELEASE MATERIALS USING SIMULATED WORSE CASE SCERNARIO CONDITIONS**

EXPERIMENTAL

- 1. PERENNIAL RYEGRASS WAS SEEDED AND MAINTAINED AT A FAIRWAY MOWING HEIGHT OF 0.5 INCHES.**
- 2. TREATMENTS WERE APPLIED TO TUBS (1.5 BY 2 FT) ARRANGED IN A RANDOMIZED COMPLETE BLOCK DESIGN AND REPLICATED THREE TIMES.**
- 3. MATERIALS WERE APPLIED AT THE EQUIVALENT RATE OF 2 LBS N PER 1000 SQ FT EVERY 30 DAYS.**
- 4. CLIPPINGS FOR GROWTH AND N UPTAKE ESTIMATES WERE TAKEN EVERY 30 DAYS FOR A TOTAL 120 DAYS.**
- 5. VISUAL RATINGS (1 TO 9 SCALE) WERE TAKEN EVERY 15 DAYS.**

EXPERIMENTAL

6. LEACHATES WERE COLLECTED EVERY 30 DAYS BY APPLYING A $\frac{1}{2}$ PORE VOLUME OF WATER TO THE TUBS (ca 500 ml) AND LETTING THEM DRAIN FOR 24 HOURS.
7. LEACHATES VOLUMES WERE DETERMINED AND ALIQUOT SAMPLES WERE ANALYZED FOR NH₄ AND NO₃ NITROGEN.
8. TOTAL N LEACHED WAS CALCULATED BY SUMMING THE PRODUCTS OF NH₄ AND NO₃ CONCENTRATIONS AND VOLUME.

TREATMENTS

1. SG39BSV
2. SG39BMV
3. SG39LSB
4. SG39LMB
5. SG28L
6. NITROFORM
7. NUTRALENE
8. CORON
9. POLYON
10. SCU
11. IBDU
12. AS
13. UAN + KNO_3
14. CONTROL

P AND K WERE APPLIED AS CSP AND KCL AT 0.25 AND 1.0 LBS/M/90 D



Growth of Ryegrass as Influenced by N Source under Glasshouse Conditions (27 DAA, 2 lbs N/1000 sq ft/90 d)

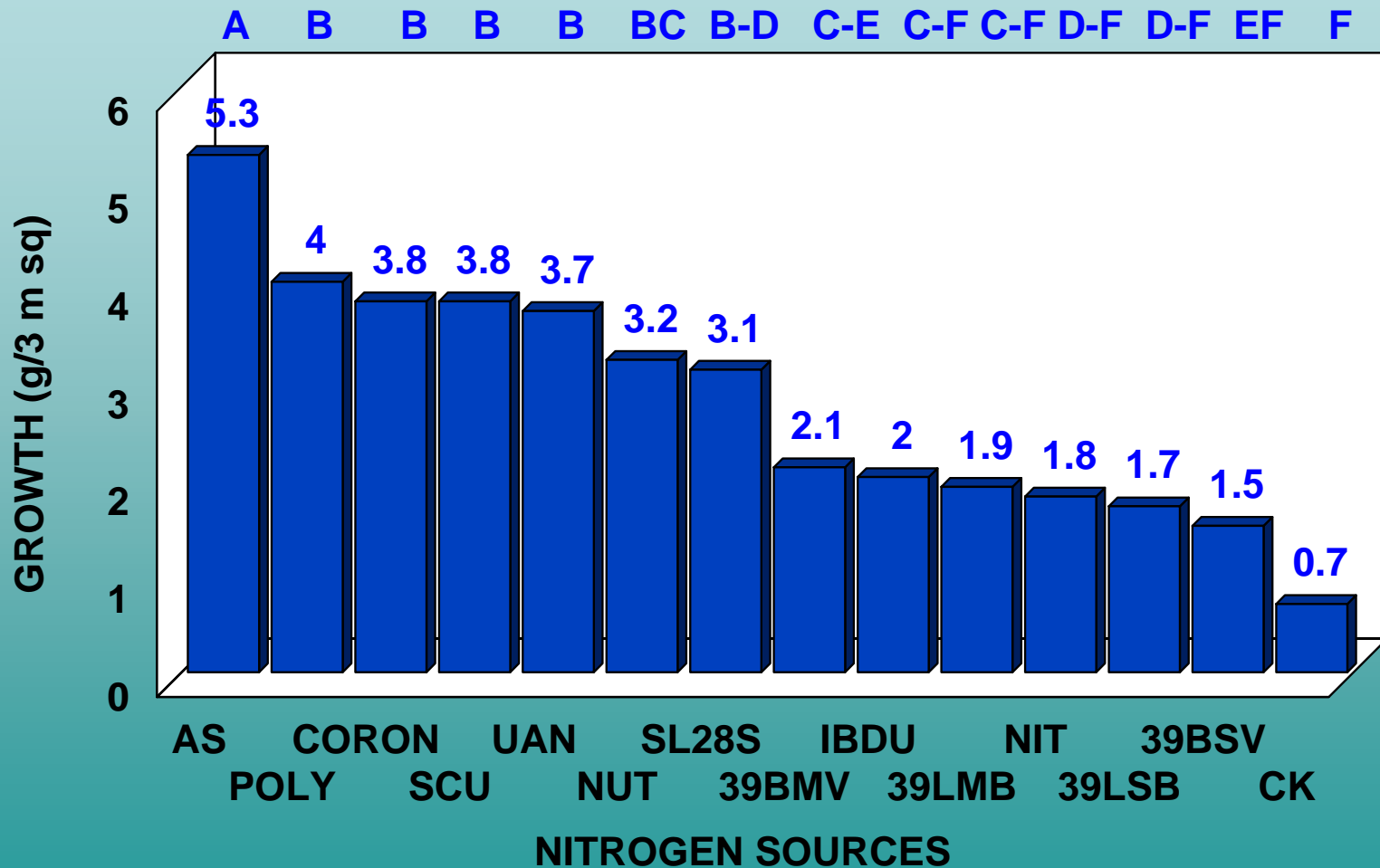


FIG 1.

Growth of Ryegrass as Influenced by N Source under Glasshouse Conditions (125 DAI, 2 lbs N/1000 sq ft/30 d)

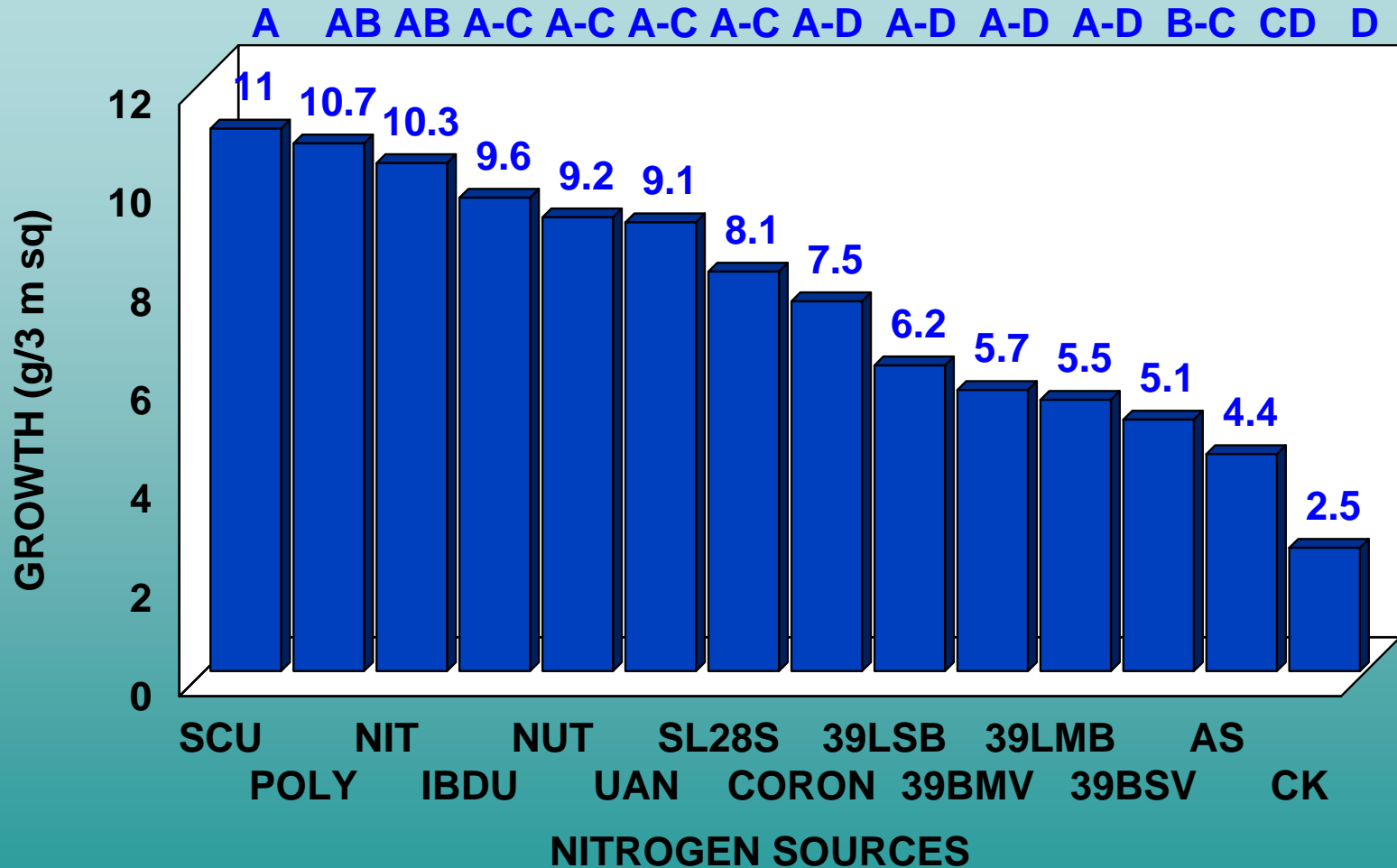


FIG. 2.

Total Growth of Ryegrass as Influenced by N Source under Glasshouse Conditions (125 d, 2 lbs N/1000 sq ft/30 d)

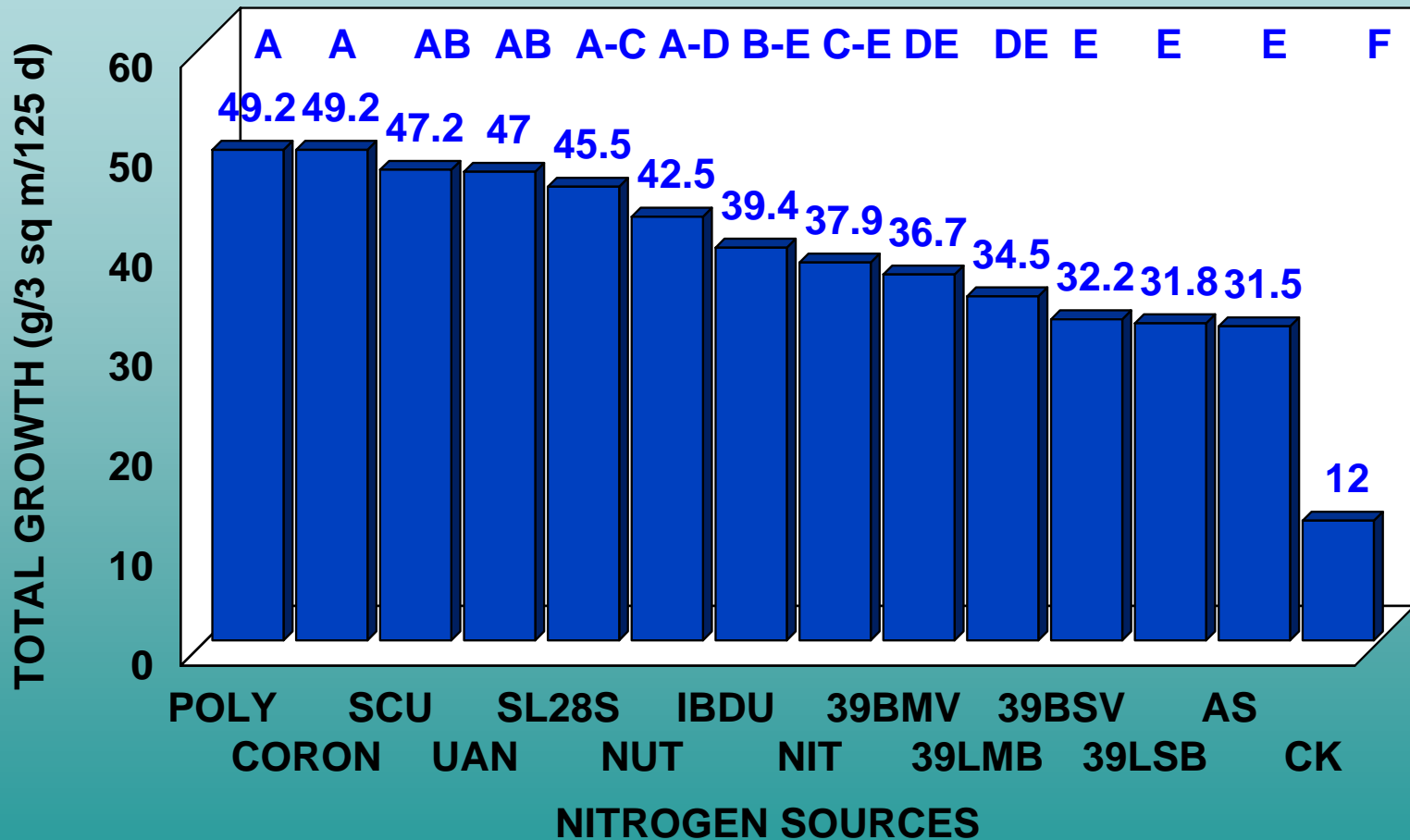


FIG. 3.

Root Growth of Ryegrass as Influenced by N Source under Glasshouse Conditions (125 DAI, 2 lbs N/1000 sq ft/30 d)

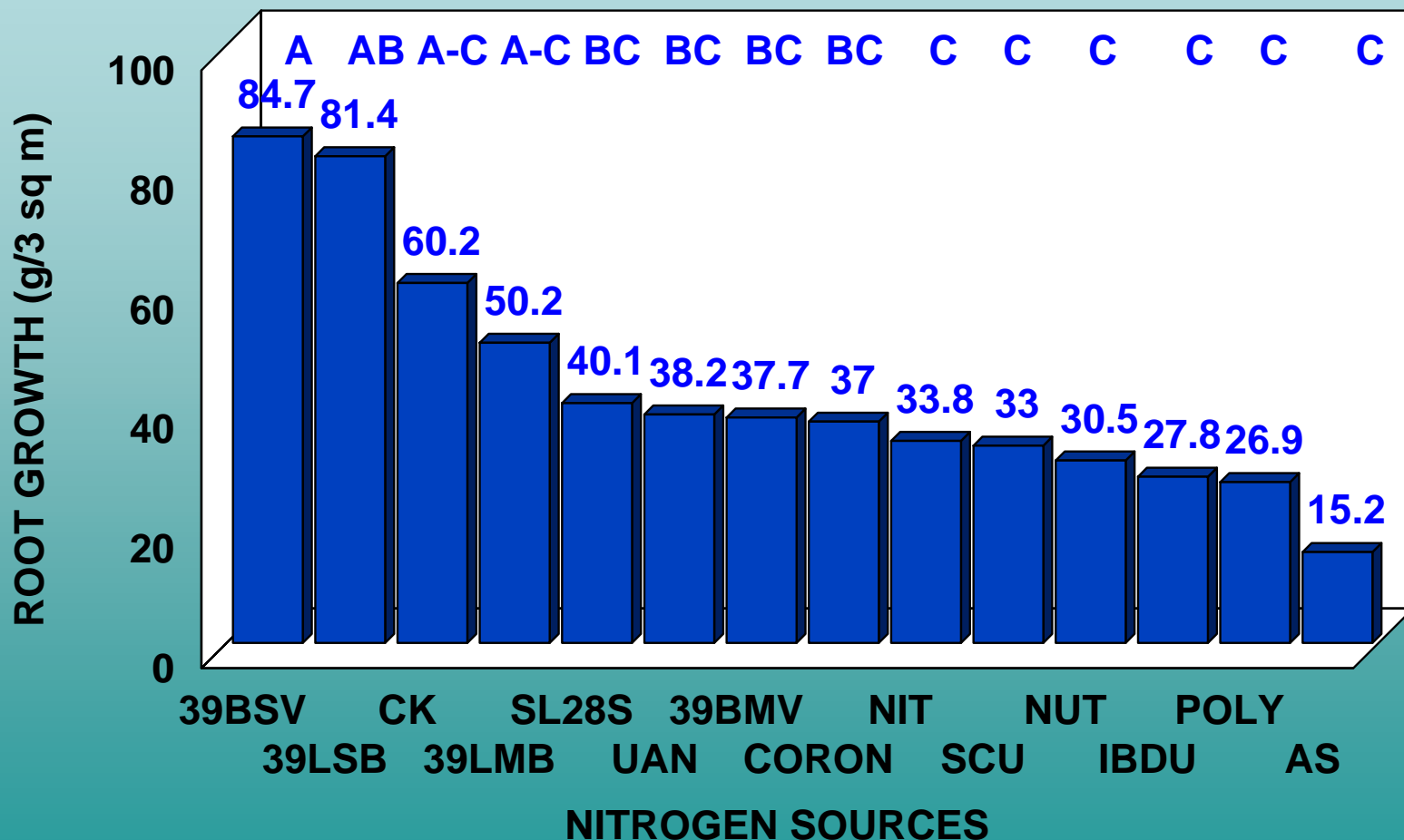


FIG. 4.



NITROFORM
(12 WEEKS)



AMMONIUM SULFATE
(12 WEEKS)

Shoot:Root Ratio of Ryegrass as Influenced by N Source under Glasshouse Conditions (125 d, 2 lbs N/1000 sq ft/30 d)

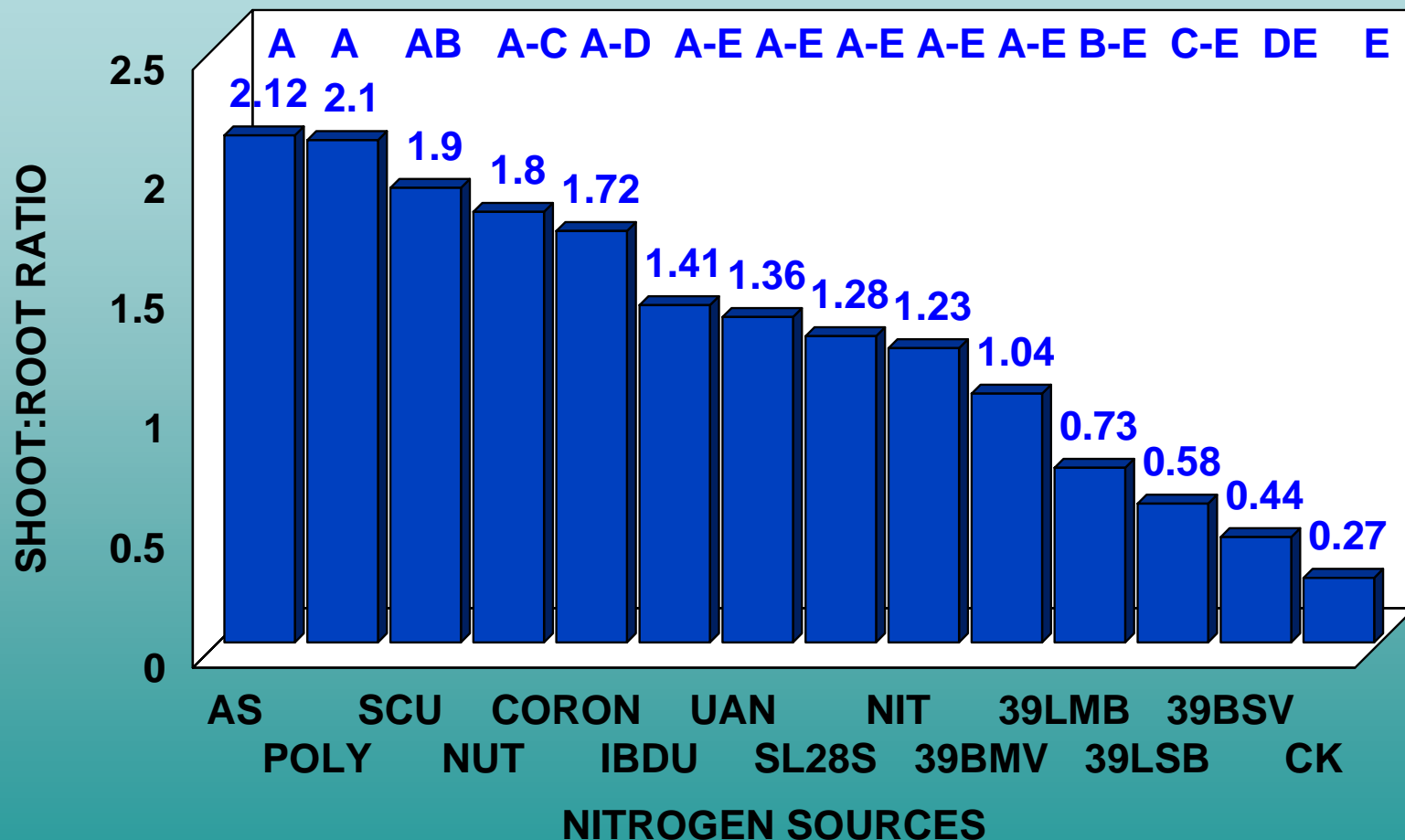


FIG. 5.

Total N Uptake by Ryegrass as Influenced by N Source under Glasshouse Conditions (125 d, 2 lbs N/1000 sq ft/30 d)

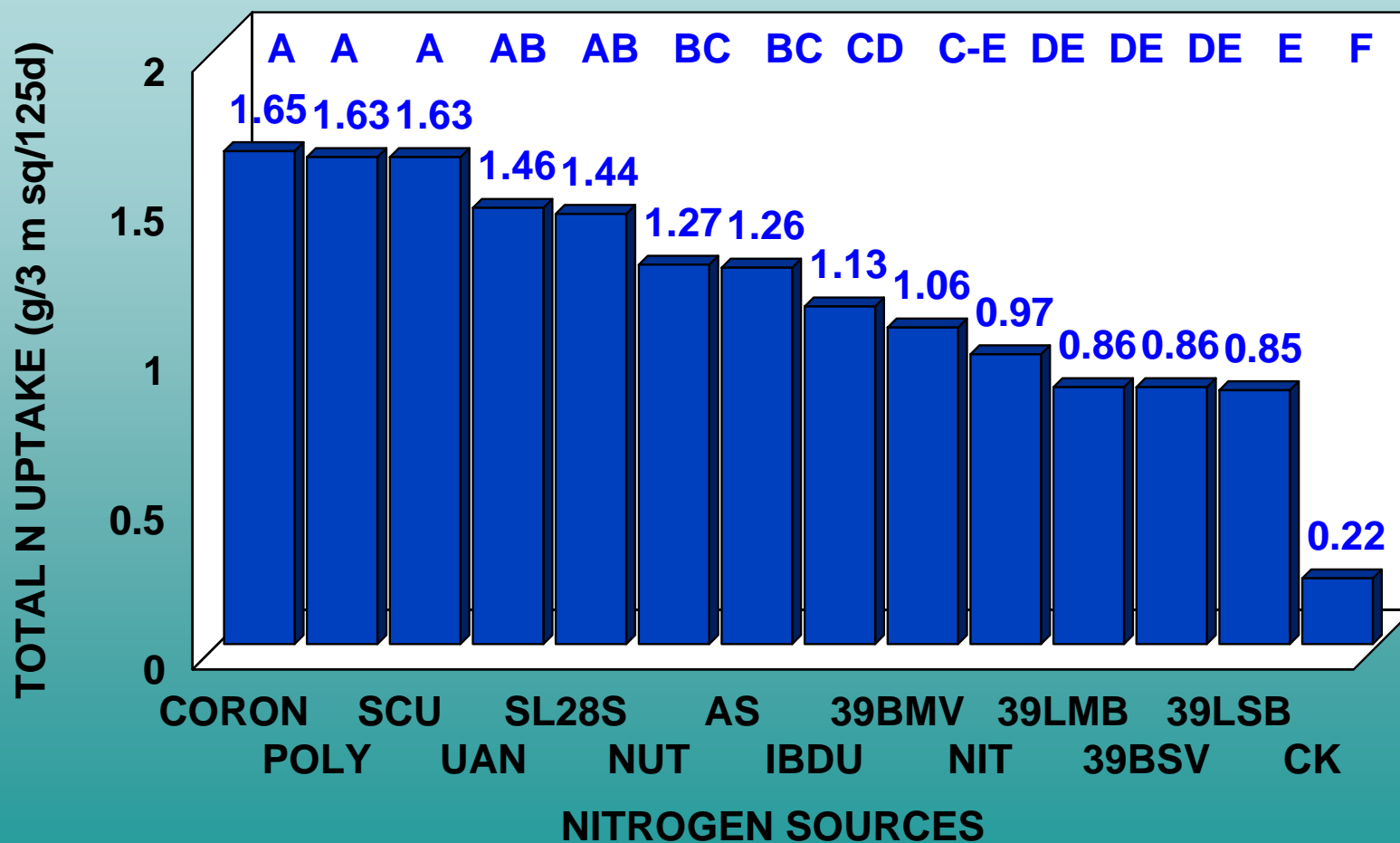


FIG. 6.

Visual Rating of Ryegrass as Influenced by N Source under Glasshouse Conditions (30 DAA, 2 lbs N/1000 sq ft/30 d)

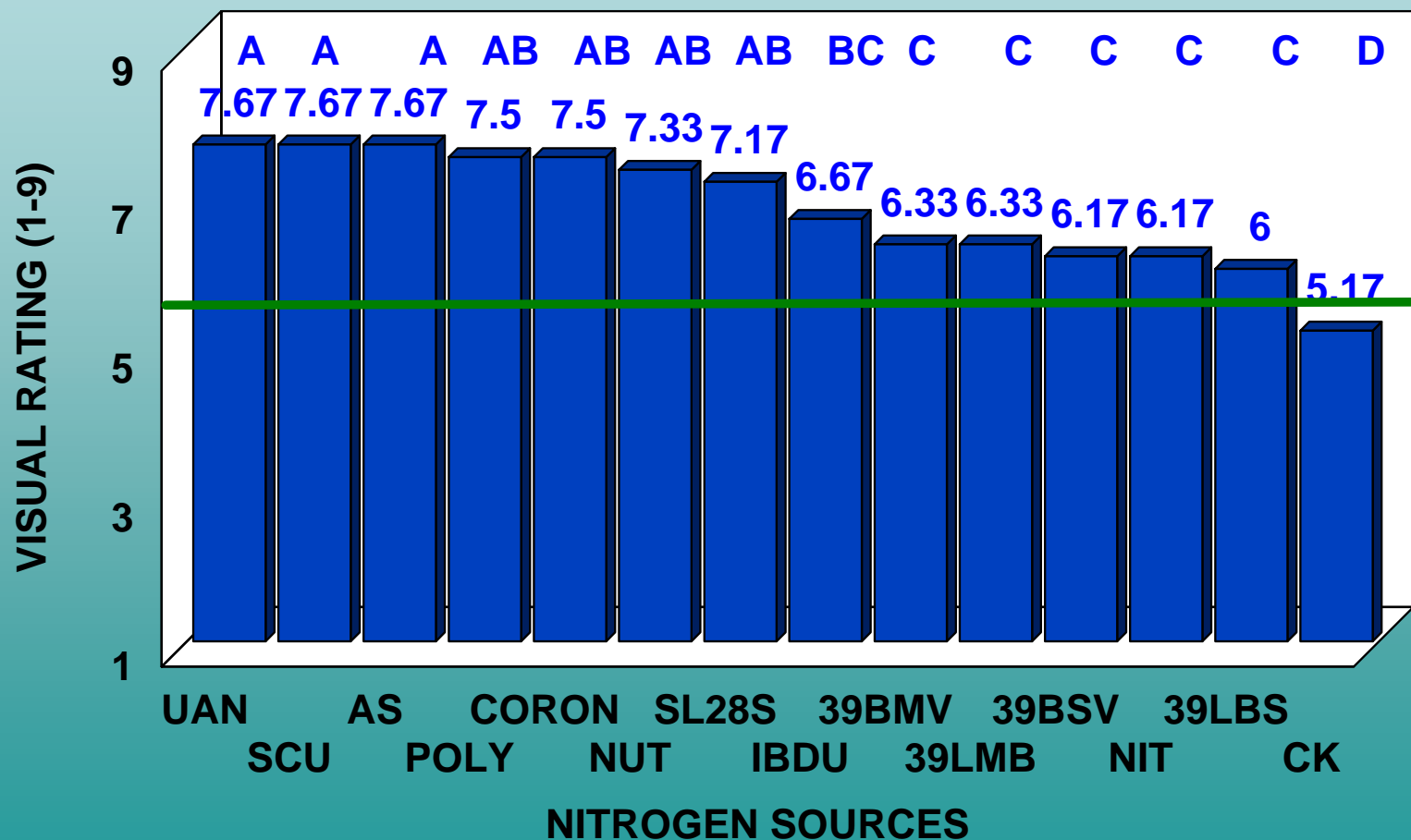


FIG. 7.

Visual Ratings of Ryegrass as Influenced by N Source under Glasshouse Conditions (125 d, 2 lbs N/1000 sq ft/30 d)

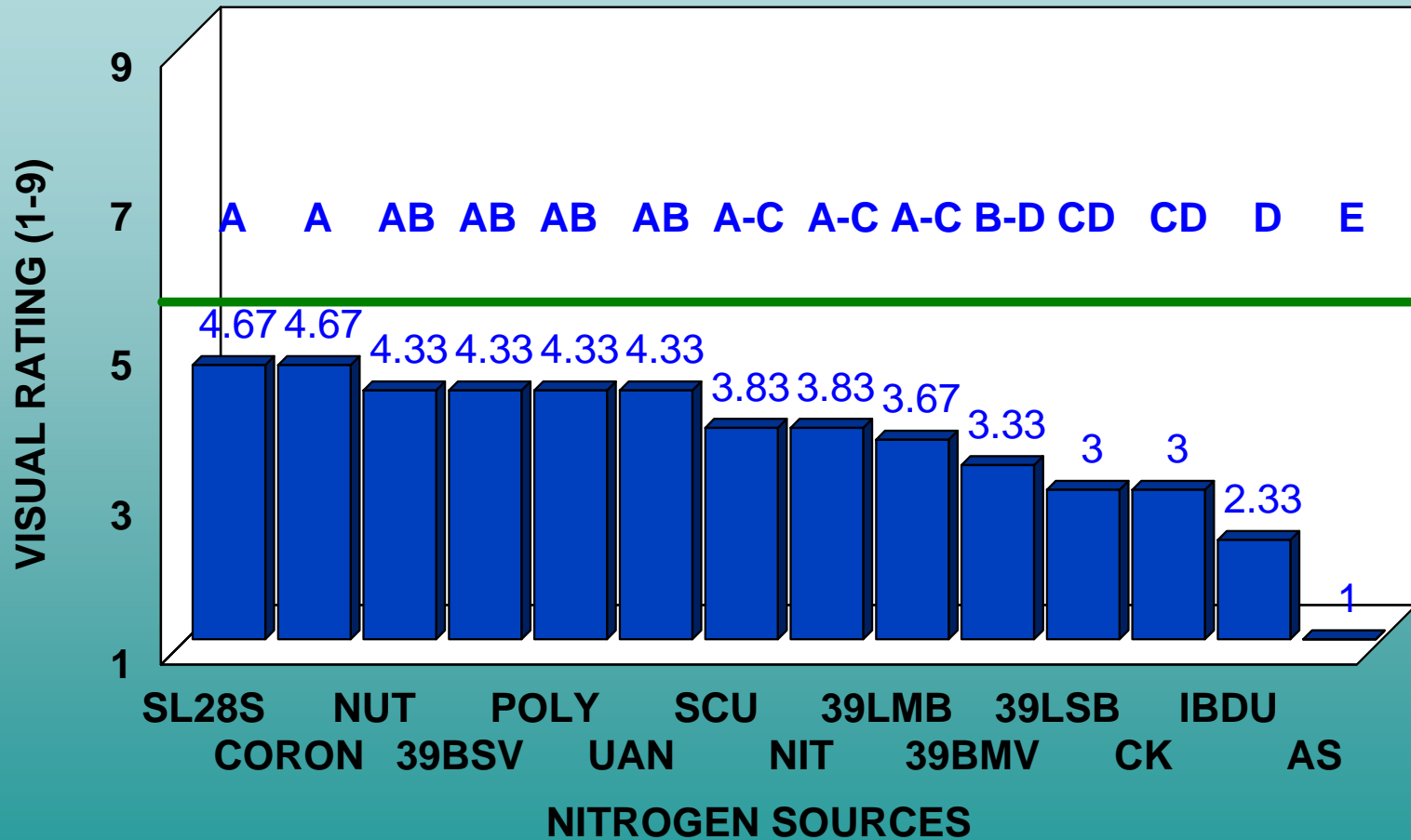


FIG. 8.

Mean Visual Rating of Ryegrass as Influenced by N Source under Glasshouse Conditions (125 d, 2 lbs N/1000 sq ft/30d)

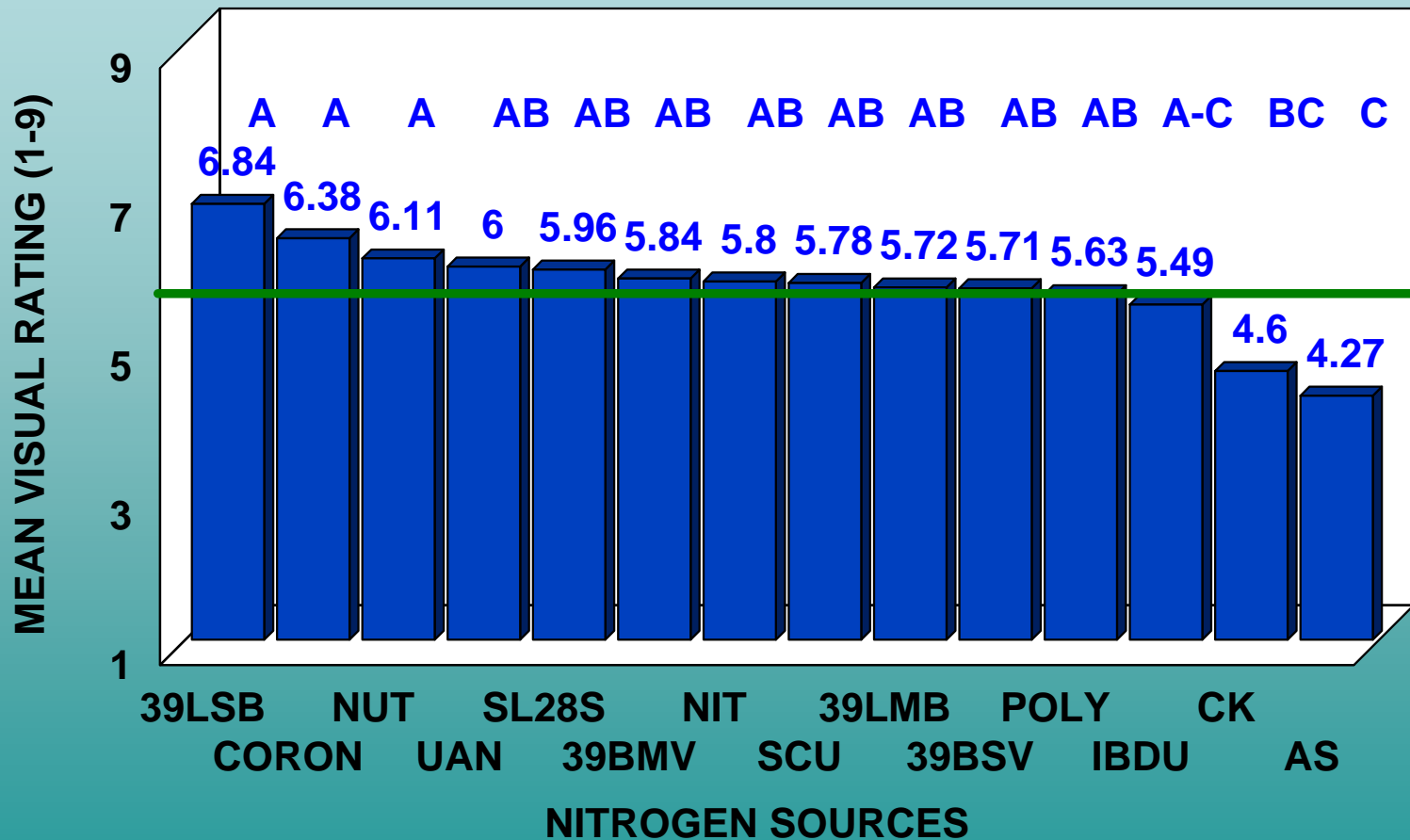


FIG. 9.

Nitrogen Leached from Ryegrass as Influenced by N Source under Glasshouse Conditions (15 DAA, 2lbs N/1000 sq ft/30d)

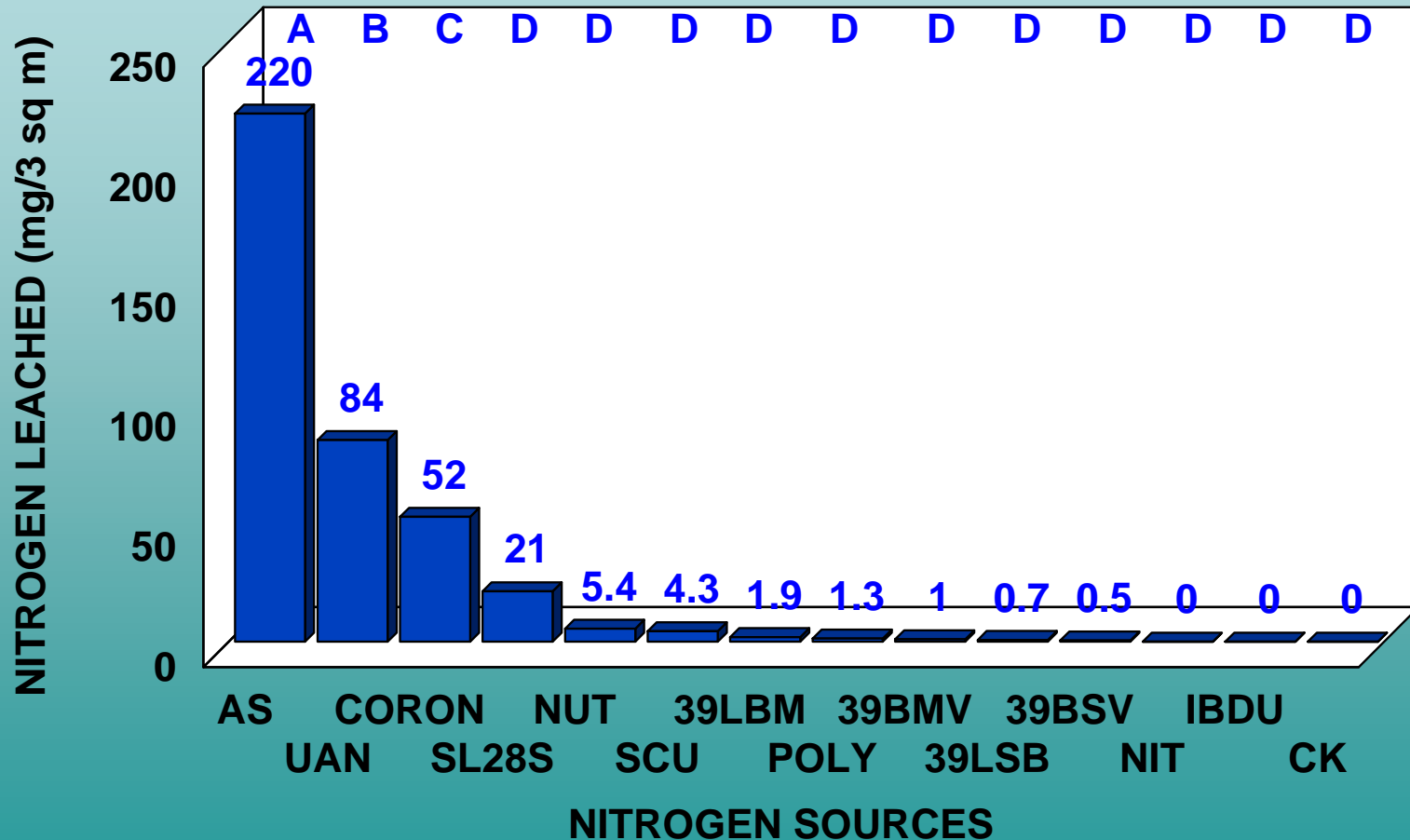


FIG. 10.

Total N Leached from Ryegrass as Influenced by N Source under Glasshouse Conditions (125 d, 2 lbs N/1000 sq ft/30 d)

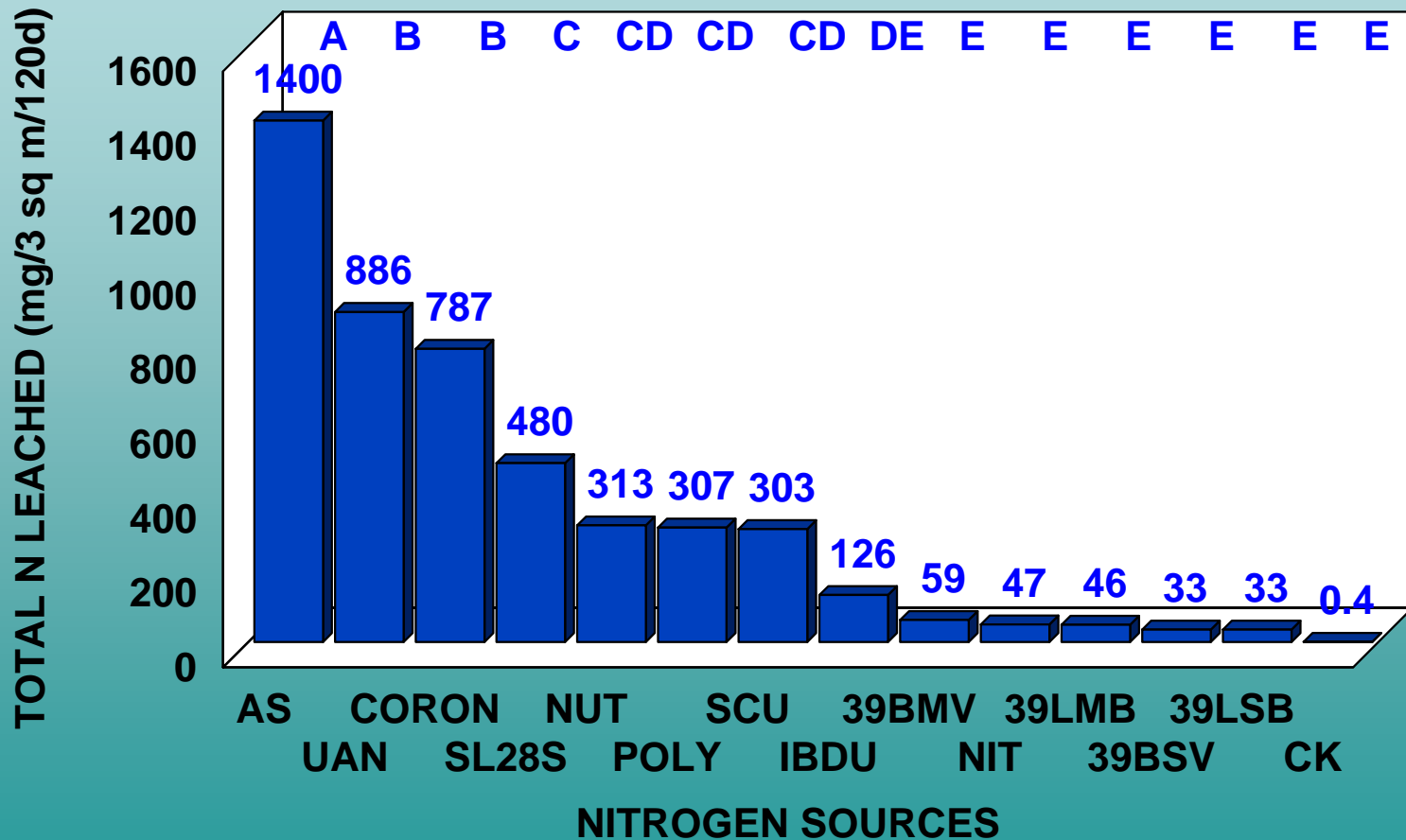


FIG. 11.

Percentage of Applied N Leached from Ryegrass as Influenced by N Source under Glasshouse Conditions (120 d, 10920 mg total N applied to 3 sq m tubs)

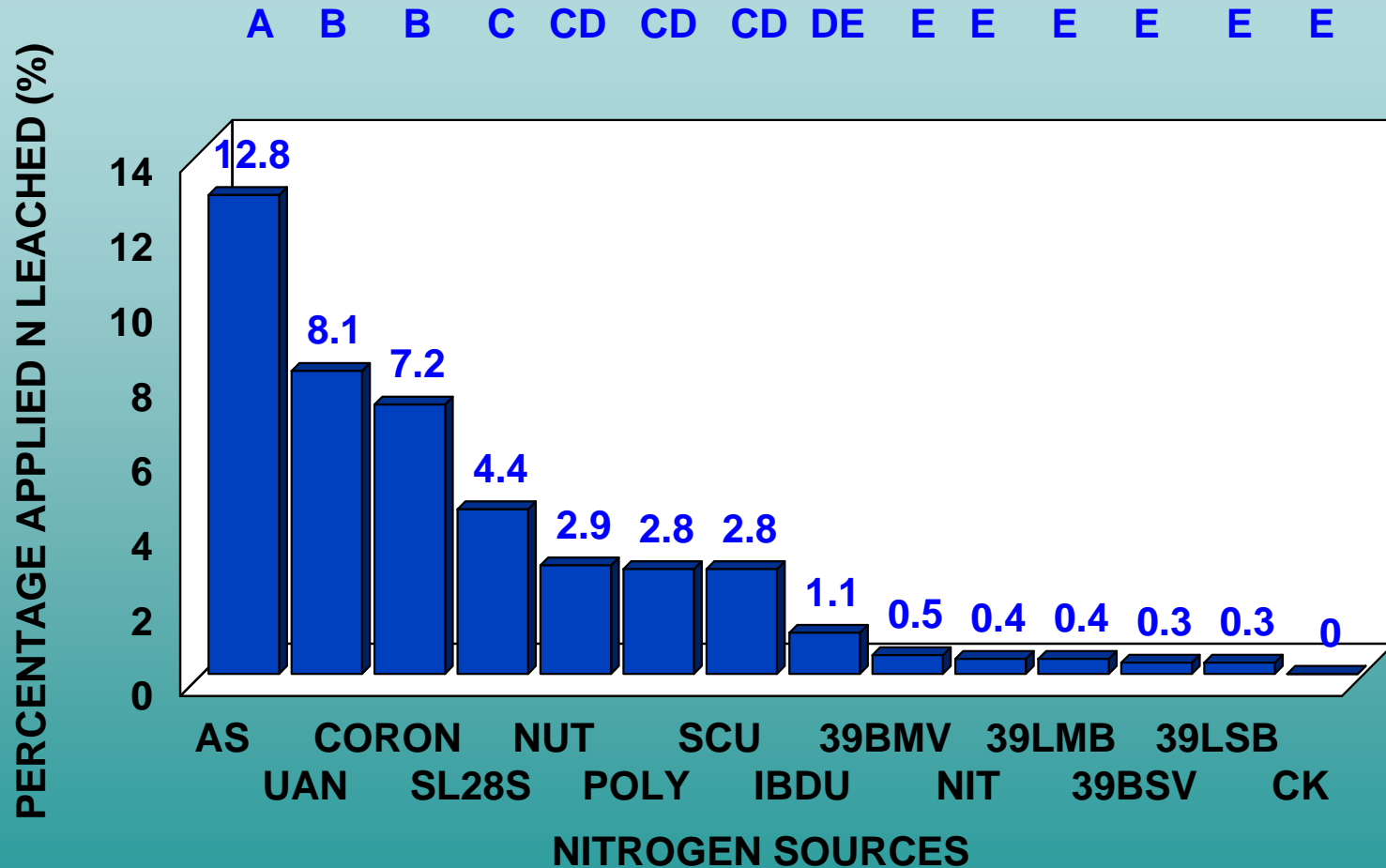


FIG. 12.

CONCLUSIONS

- 1. SOLUBLE N SOURCES LEACH MUCH MORE N THAN DO SLOW-RELEASE N SOURCES**
- 2. SL28S PRODUCED GOOD GROWTH AND QUALITY WHILE LEACHING LESS N.**
- 3. GRANULAR METHYLENE UREAS PRODUCED MARGINAL GROWTH, BUT PRODUCED ACCEPTABLE QUALITY TURFGRASS WITHIN 30 DAA AND LEACHED VERY LITTLE N UNDER AGGRESSIVE LEACHING CONDITIONS**
- 4. SADEPAN'S METHYLENE UREAS PROMOTED STRONG ROOT GROWTH AND LESS TOP GROWTH**
- 5. AS IN THE FIELD STUDY, N RATE AND TIMING OF APPLICATION SHOULD BE EVALUATED TO POSITION THE GRANULAR METHYLENE UREAS IN MARKET.**





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