

THE EFFECT OF NITROGEN SOURCES, RATES AND
APPLICATION METHODS ON BERMUDAGRASS
PRODUCTION

By

LAWRENCE GEORGE BOHL

Bachelor of Science

Oklahoma Panhandle State University

Goodwell, Oklahoma

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Thesis Approved:

Billy B. Tucker
Thesis Adviser

R D Morrison

W E McMurphy

N N Suttan

Dean of the Graduate College

947485

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CHAPTER I

INTRODUCTION

In recent years materials or methods which enable the availability of N (nitrogen) fertilizers to be slowed or controlled have received considerable attention. Due to the high solubility and mobility of N in the soil, N may be lost due to leaching, wasted by luxury consumption early in the growing season, or rendered unavailable by reacting into the soil organic cycle. High rates of soluble N may damage young seedlings, and can increase the accumulation of nitrates in some forage species. Abnormally high levels of nitrates in forages can be toxic to livestock. For these reasons a slow-release N source may have many agronomic benefits.

An ideal slow-release N source would release to the plant enough N to meet the plants demand without loss by leaching or volatilization. With a slow-release N source a more uniform growth pattern throughout the growing season might be expected with perhaps higher yields of a higher quality crop, and less seedling damage. A single application of a higher rate of slow-release N could be applied instead of split applications of lower rates of soluble N. A slow-release N source may also reduce the possibility of ground water pollution and pollution of streams and lakes.

The purpose of this study was to compare two slow-release N materials, B (biuret) and SCU (sulphur-coated urea), with AN (ammonium nitrate) and U (urea).

CHAPTER II

LITERATURE REVIEW

Numerous articles may be found in the literature describing the effects of N sources and rates on crop yields. Most of the papers deal with soluble, readily available sources of N. An excellent review of N sources is available (Rogers, 1972). This review will be confined to the properties of SCU and B as N sources.

In greenhouse and laboratory experiments Allen et al. (1971) found that the dissolution rate of SCU increased with a temperature increase up to a 35 C day and a 25 C night, the highest temperatures used. Severe N losses from surface applied U were noted. Single applications of SCU or split applications of AN or U resulted in more uniform growth of bermudagrass (Cynodon dactylon L. Pers.) over the test period than did single applications of AN or U.

Field experiments Mays and Terman (1969) using SCU and uncoated soluble N sources for fescue forage production showed that SCU produced less early growth but greater production later in the season than did the soluble sources. A lower percent recovery of N was found for uncoated U, and fertilizer containing urea when topdressed at high rates. More residual remained after the first cropping season from the SCU sources than from the soluble sources. There was no evidence of undissolved SCU granules remaining past the first growing season.

Results from one years data was reported Westfall (1971) on Gulf

Ryegrass (Lolium Multiflorum Lam.) comparing U and SCU. Forage and protein production from one application of SCU was more evenly distributed throughout the growing season than from two applications of U. Immediately after application of U there was a flush of growth and protein production, followed by a decline in both.

Biuret was first isolated and identified in U fertilizers after toxic effects on plant growth was noted. Most of the experiments involving B have been to determine the detrimental effect on germination and plant growth. Jackson and Burton (1959) studied the effect of B in U when applied to Coastal bermudagrass. The test was initiated because of lower yields from U as compared to AN in some experiments. Urea contained 1-11% B, and it was thought this might be the cause of the reduction in yields. A constant rate of 200 lb N/acre was used with 0, 5, 10, 20 and 40% of the total being B. Production from the first harvest was reduced by the 20 and 40% B treatments. After the first harvest, yields from the B treatments increased and total production showed no decrease. Purified U was used in the test. A significant yield reduction from the plots receiving U occurred. The conclusions were that although B did cause plant toxicity, it was rather quickly altered in the soil to a usable form of N.

Bell et al. (1947), indicated that toxicity lasted approximately six weeks on radishes (Raphanus sativus) from two or more than eleven weeks on perennial ryegrass (Lolium perenne) and from two to four weeks on colonial bentgrass (Agrostis tenuis sibth.) when evaluated by germination of the seed in B treated soil.

Smika and Smith (1957), showed that the presence of B delayed germination of wheat much more than AN when placed in contact with the seed.

Increasing the ratio of B:U increased toxicity more than if a larger amount of total N was applied to increase the amount of B without changing the B:U ratio.

CHAPTER III

MATERIALS AND METHODS

Four field experiments were conducted to evaluate the N sources for bermudagrass (Cynodon dactylon L. Pers.) production. In addition to sources, N rates and application dates were variables. All tests were located on well-established Midland bermudagrass sod.

Test locations were chosen to give a wide variation in soils and climatic situations. The experimental sites and soil types are given in Table I.

Treatments for each of the experiments were summarized in Table II.

All plots received adequate P and K fertilization as determined by a soil test.

Biuret and B mixtures were furnished by Nipak, Inc., a subsidiary of Lone Star Gas Company. The three SCU materials were furnished by the Tennessee Valley Authority. The composition and some characteristics of the N sources are given in Table III.

All tests were of randomized block incomplete factorial design. The prilled fertilizer materials (AN, U, SCU) were applied with either a Barber pull type spreader or a Gandy push type spreader. The first batches of B, B+U and B+S were a non-wettable powder, these were applied with a Gandy spreader. Later batches of B material were wettable powder which was applied by spraying as a suspension.

All studies were initiated in 1971. Data are presented from Exp. I

TABLE I
BERMUDAGRASS TEST LOCATIONS AND SOIL CLASSIFICATION

EXP. NO.	LOCATION	SOIL
I	Eastern Pasture Research Station Muskogee, Oklahoma	Typic Argiudolls Bates Loam
II	Eastern Pasture Research Station Muskogee, Oklahoma	Mollic Paleudalfs Taloka silt loam
III	Sandy Land Research Station Mangum, Oklahoma	Aquic Arenic Haplustalfs Mino sandy loam
IV	Agronomy Research Station Stillwater, Oklahoma	Cumulic Haplustolls Port loam

TABLE II
TREATMENTS FOR BERMUDAGRASS EXPERIMENTS

Experiment I, Muskogee

FERTILIZER MATERIALS	RATES LB N/ACRE	METHOD
1. B	0	
2. B+U (biuret + urea)	50	Single Application
3. B+S (biuret + sulfur)	100	Single Application
4. AN	100	Split Application
5. U	200	Single Application
6. SCU-10	200	Split Application
7. SCU-20	400	Single Application
8. SCU-30	400	Split Application

Dates of Applications:

1. March 15, Single Application
 2. Split Application, $\frac{1}{2}$ rate, May 1, July 1
- 57 Treatments, 4 Replications

TABLE II (Continued)
Experiment II, Muskogee

FERTILIZER MATERIAL	RATES
1. B	1. April 1
2. B+U	2. May 5
3. B+S	3. July 1
4. AN	4. August 15
5. U	
6. SCU-20	

Rates: 0, 200 lb N/Acre

1. Single application, applied total rate April 1
2. Split applications, applied 50 lb N/Acre each date
- 13 Treatments, 4 Replications

TABLE II (Continued)
Experiment III and IV

FERTILIZER MATERIALS	RATES LB N/ACRE	METHOD
1. B	1. 0	-----
2. B+U	2. 50	single application
3. AN	3. 100	single application
4. U	4. 100	split application
5. SCU-30	5. 200	single application
	6. 200	split application
	7. 400	single application
	8. 400	split application

Dates of application:

1. Single application, March 15
2. Split applications, 1/2 rate May 1, July 1
- 36 Treatments, Experiment IV = 3 Replications (Stillwater)
- Experiment III = 4 Replications (Mangum)

TABLE III
CHEMICAL COMPOSITION OF NITROGEN SOURCES
USED IN BERMUDAGRASS EXPERIMENTS

SOURCE	% N	% S
B	30-36	0
B+U ¹	40	0
B+S	29	18
AN	33.3	0
U	45.5	0
SCU-10 ²	34.7	20
SCU-20 ³	36.5	15
SCU-30 ⁴	38.7	10

(1) $\frac{1}{2}$ N from B, $\frac{1}{2}$ N from U

(2) Dissolution rate of 10% in 7 days in 100 F water

(3) Dissolution rate of 20% in 7 days in 100 F water

(4) Dissolution rate of 30% in 7 days in 100 F water

and II from 1971-1973. Data were collected from Exp. IV only in 1971, and from Exp. III in 1971-1972 due to loss of the experimental sites.

Because of the results from 1971, the B sources were not applied the following year. The plots that had received B sources in 1971 were harvested the following years to determine residual N.

The percent N in the forage from all tests is low due to the maturity of the forage when harvested.

CHAPTER IV

RESULTS AND DISCUSSION

Experiment I, Muskogee

This experiment was conducted in 1971, 1972 and 1973. Yield data for all treatments are reported in Appendix Tables XIX, XXIX, XXXIX. Percent N in the forage for all treatments are reported in Appendix Tables XXII and XXXIII. Pounds of N produced from the forage are given in Appendix Tables XXV, XXXV for each treatment. Due to the voluminous amount of data, certain measurements are presented graphically for clarity. Analyses of variances are tabulated in Appendix Tables XX, XXI, XXIII, XXIV, XXVI, XXVII, XXX, XXXI, XXXII, XXXIV, XXXVII, XXXVIII, XL, XLI and XLII.

Experiment I (1971). A comparison of N sources on forage yield in which 50 lb N/acre were applied in one application at the beginning of spring growth is shown in Fig. 1 for 1971. Biuret and B+U did not significantly increase yields over the check. Neither AN nor U produced yields superior to the other sources and yields were not different from each other. Yields from B+S was superior to B and B+U and was equal to the three SCU sources. Yield differences among the three SCU sources were not significantly different.

The average forage yield of each source by the four harvests are graphed in Fig. 2. These are averaged over all rates (100, 200 and 400 lb N/acre) and over single and split applications. Ammonium nitrate

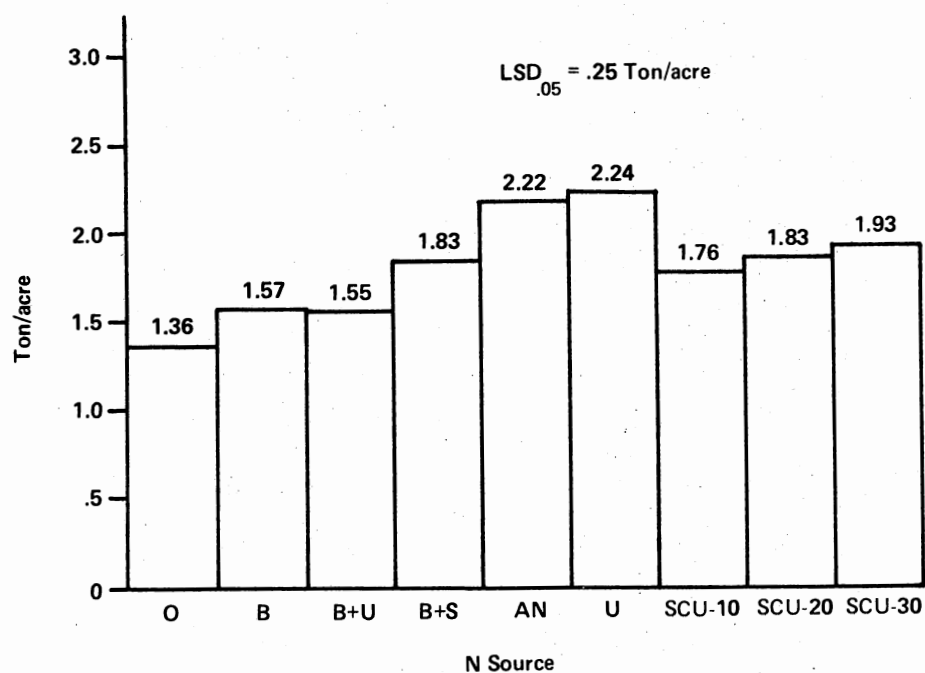


Figure 1. Bermudagrass Yields as Affected by Nitrogen Sources Applied at 50 lb N/Acre Compared to 0 N/Acre, Exp. I (1971)

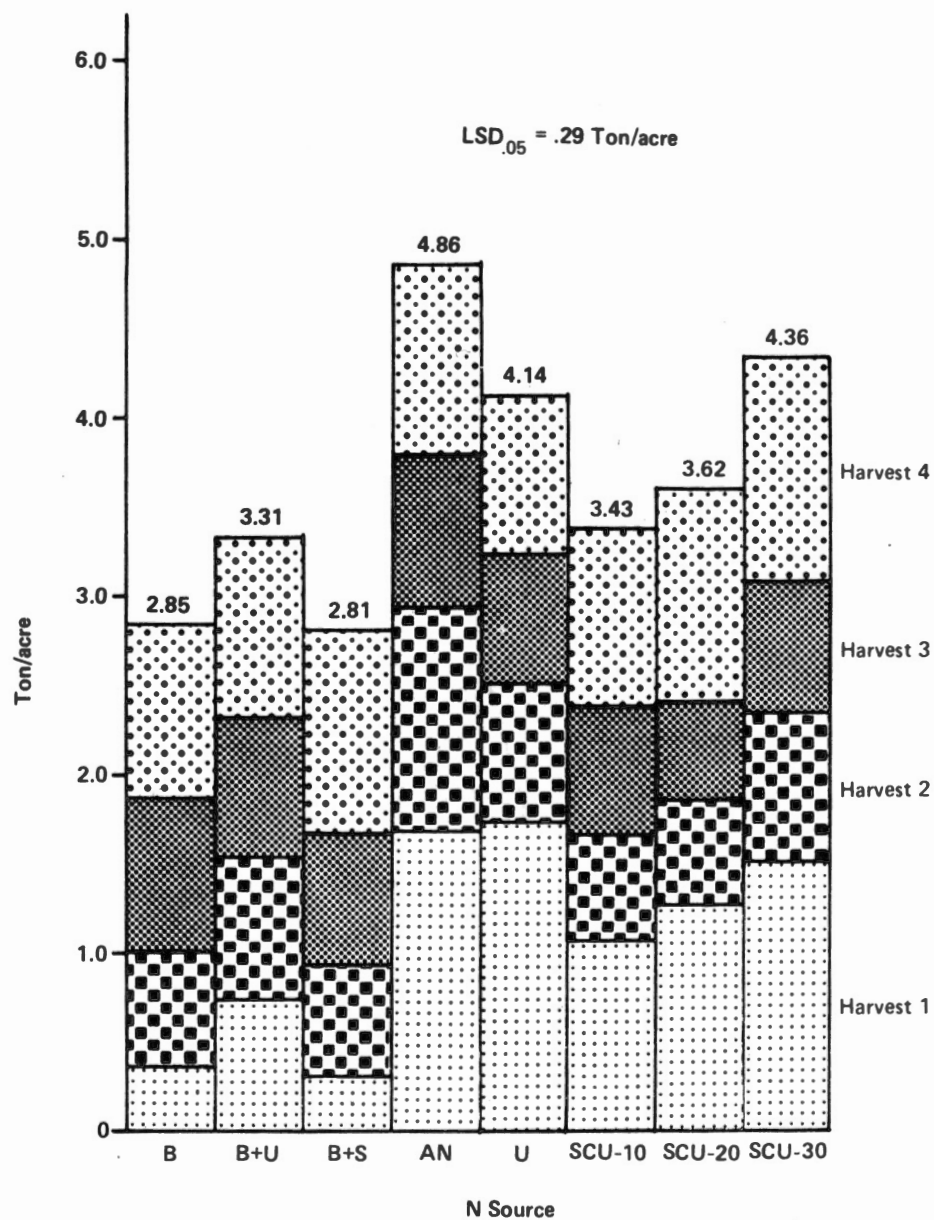


Figure 2. Bermudagrass Yields as Affected by Nitrogen Sources (Averaged Over Rate and Method of Application), Exp. I (1971)

produced more total forage than the other sources. The yields ranked as follows: $B = B+U = SCU-10 < SCU-20 < U = SCU-30 < AN$. Very low first harvest yields were produced by the B sources. Biuret was toxic to the bermudagrass which resulted in thinned stands. Much of the dry matter produced from the B plots in subsequent harvests was from crabgrass which invaded these plots.

The results from the method of application (single and split) for each source can be seen in Fig. 3. Highest yields were obtained from split applications for U and B+U, and yields from AN were not different due to methods of application. All other sources produced higher yields when applied as a single application early in the season. All B sources produced low first harvest yields. Lower yields occurred from single applications of B as contrasted to split applications. This demonstrated the toxicity effect from the B on that first harvest since yields were lower in spite of higher N rates. It is also noteworthy that yields from AN were superior to yields from U when the entire application was made in a single application. This difference dissipated when applications were split.

Yields due to the effects of sources and rates of N averaged over method of application are given in Fig. 4. With the exception of B, total yields increased with each increment of applied N. The toxicity of B is apparent in that first cutting yields were reduced as B rates increased. Sources (AN and U) gave higher yields than the SCU sources at low rates but compared favorable at the 400 lb/acre rate.

Nitrogen recovery percentages are an index to efficiency of use of applied N. It must be remembered that total N removed by the forage is calculated by multiplying the percent of total N concentration in the

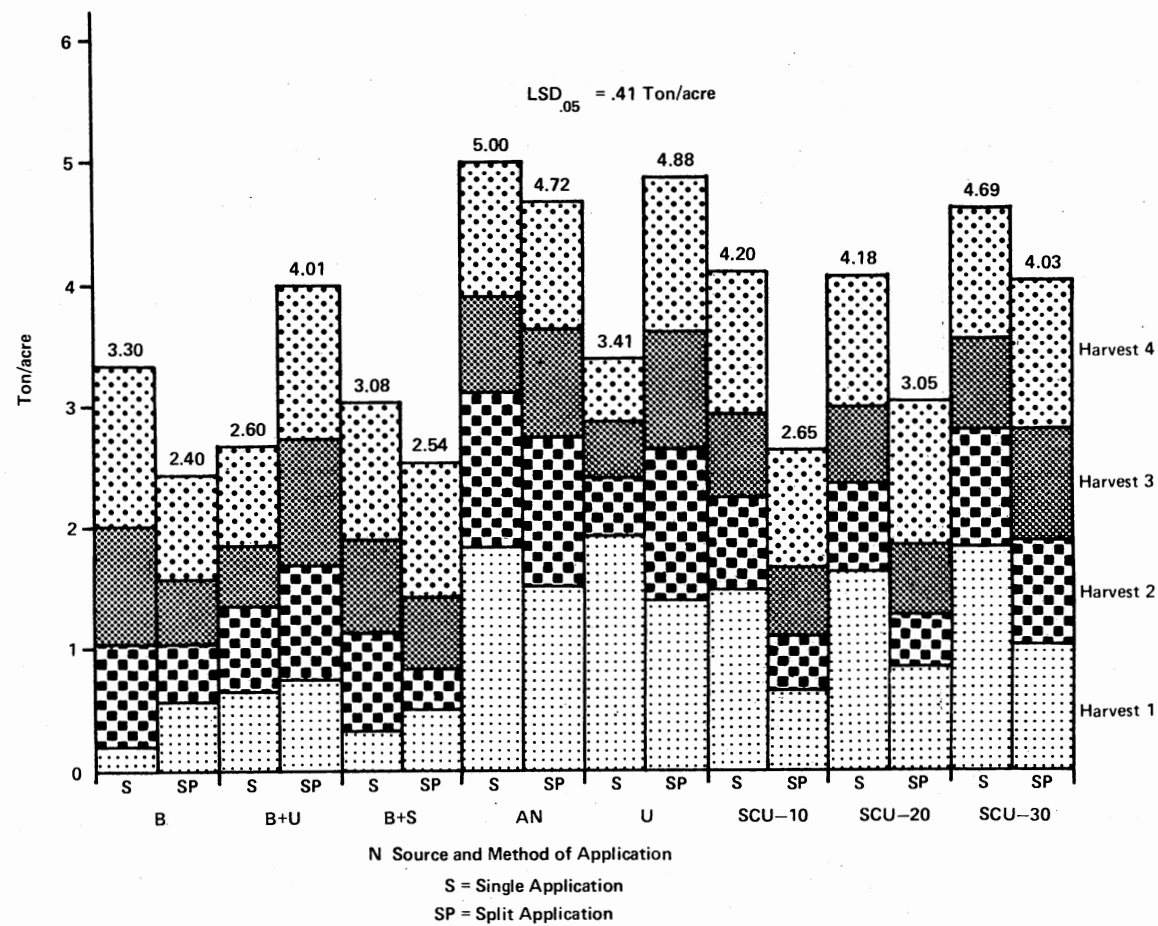


Figure 3. Bermudagrass Yields as Affected by Sources of Nitrogen Applied as Single and Split Application (Averaged Over Rate), Exp. I (1971)

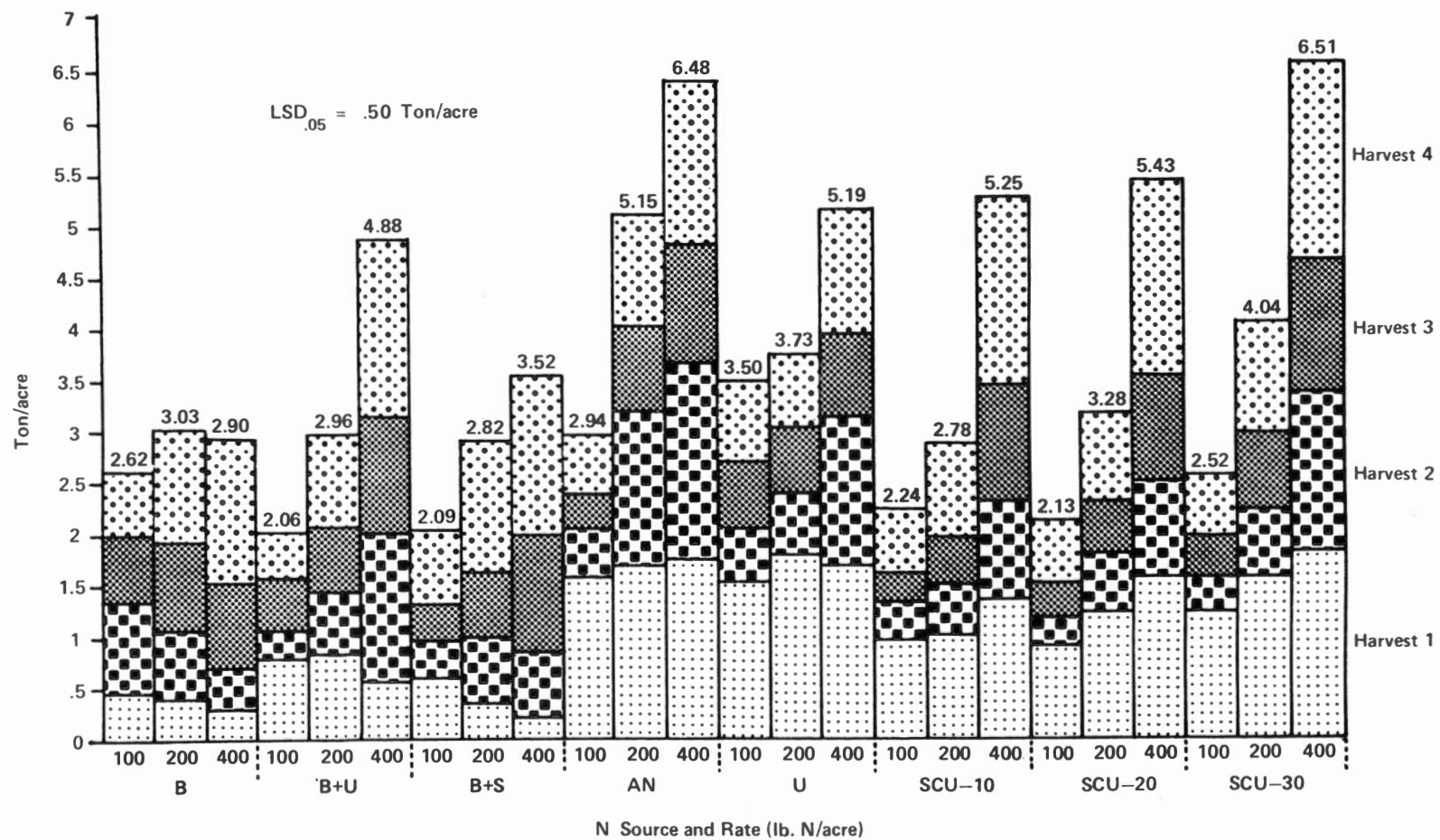


Figure 4. Bermudagrass Yields as Affected by Nitrogen Sources and Rates (Averaged Over Method of Application), Exp. I (1971)

forage by the total yield, and the origin of the recovered N cannot be ascertained. The "priming effect" Westerman and Kurtz, (1973) from soil organic matter may mean some uptake of the nitrogen was innate soil N and not all of the "recovered N" originated from the applied fertilizer N.

The N recovery percentages are plotted against application rates for both split and single applications for each source in Fig. 5. Recoveries from AN and U were much larger than less soluble sources. The low soluble sources recoveries were greater when applied in a single application but it is significant that N recovery from U was much greater for split applications. The most soluble SCU sources (SCU-30) gave higher N recoveries than SCU-20 and SCU-10. Seasonal distribution of N production is presented in Appendix Table XXVIII, as percent of total N produced by harvest from the forage.

Experiment I (1972). Only two harvests were obtained during 1972 because of severe soil moisture stress. The B treatments were not applied in 1972 but the plots receiving these treatments in 1971 were harvested and compared with the control treatment to measure any residual N.

As can be seen from Fig. 6 and 7, the only N benefiting forage production was the 400 lb N/acre rates of B and B+S. These results were disappointing because, based upon total N removal in 1971, significant N carryover from even the lower rates would be expected.

Those sources that were reapplied on the same plots in 1972 at the 50 lb N/acre are compared in Fig. 8. At this low rate no differences in total forage production between sources were obtained although yield was doubled over the check. Yields were increased approximately 3/4

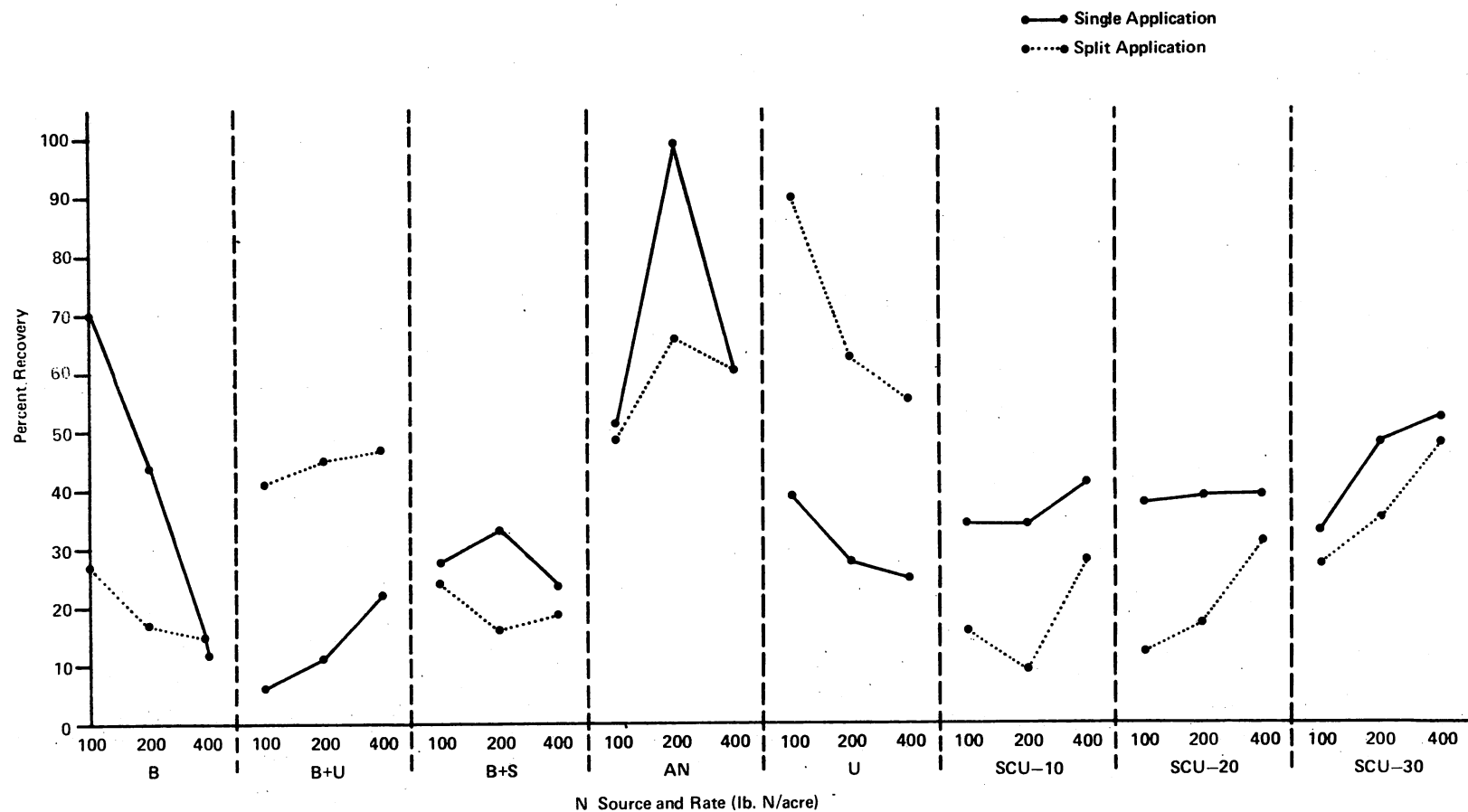


Figure 5. Percent Recovery of Applied Nitrogen by Bermudagrass as Affected by Nitrogen Sources, Rates and Method of Application, Exp. I (1971)

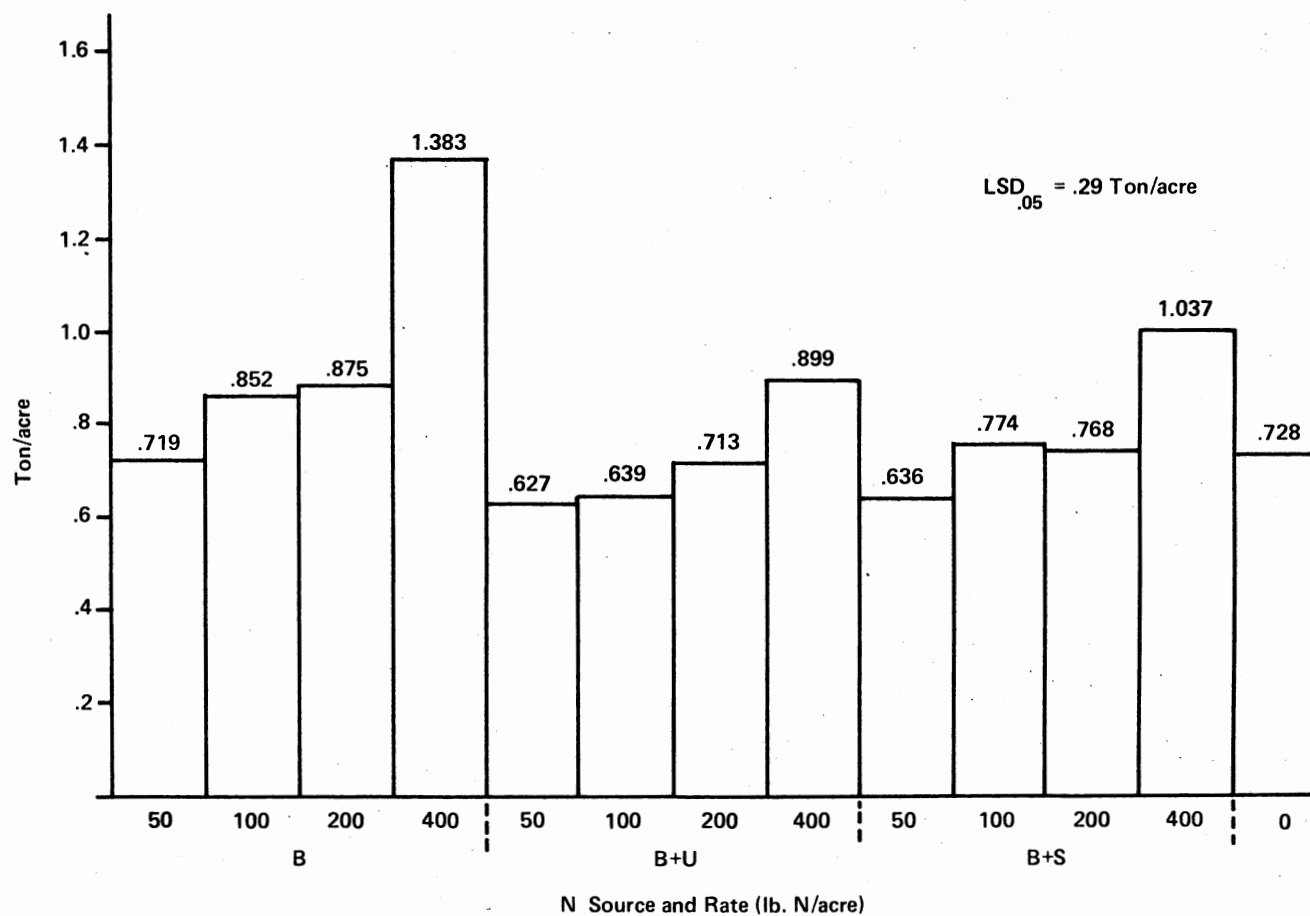


Figure 6. Bermudagrass Yields as Affected by Residual Biuret Sources and Rates (Applied as Single Applications, 1971), Exp. I (1972)

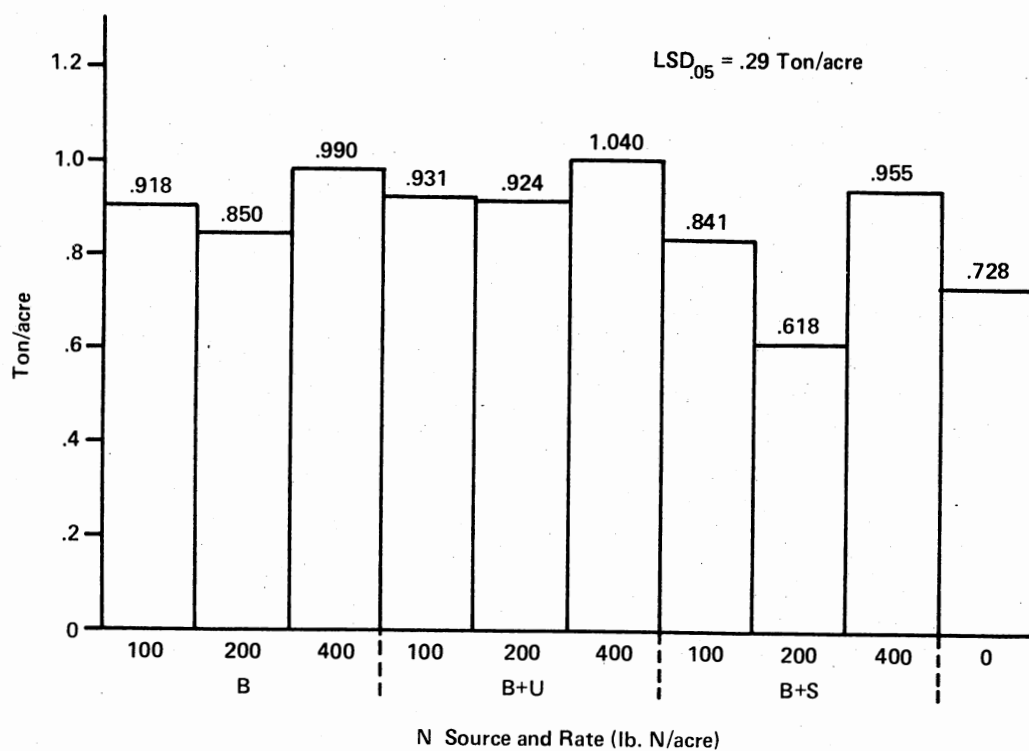


Figure 7. Bermudagrass Yields as Affected by Residual Biuret Sources and Rates (Applied as Split Applications, 1971), Exp. I (1972)

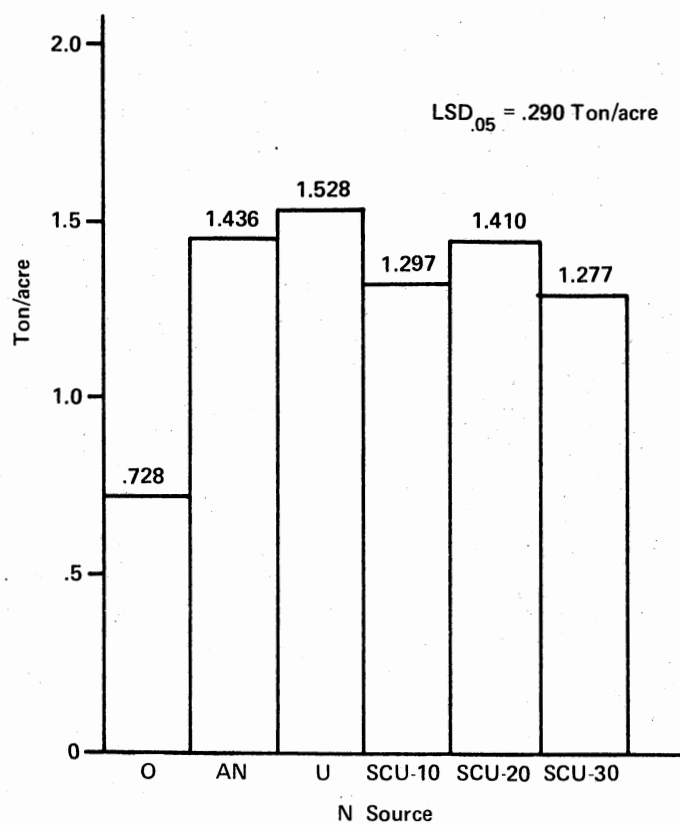


Figure 8. Bermudagrass Yields as Affected by Nitrogen Sources Applied at 50 lb N/acre Compared to 0 N/Acre, Exp. I (1972)

tons/acre with 50 lb of N/acre.

No differences in total yields were obtained between the SCU sources or AN at the higher rates. This was true from both single and split applications. The variables that gave significant yield differences were the rate and number of applications. In Fig. 9 the average of all sources at the 100, 200, and 400 lb N/acre rate is shown with both single and split applications. Yields increased as the rate increased. Higher yields were obtained with a single application at the beginning of spring growth than where the applications were split.

Experiment I (1973). During 1973 the plots were harvested only two times. Soil moisture was more than adequate early in the season, but it was extremely dry during late summer.

No B sources were applied, thereby, giving residual treatments of these sources for two years. Production from the residual B treatments was the same as that from the check plots.

Average yields of each source at the 50 lb N/acre rate are plotted in Fig. 10. As contrasted to the previous year, U was substantially inferior to AN and SCU-10 and SCU-20 were superior to U and SCU-30. Very heavy rains occurred immediately after application and perhaps the U was leached out of the root zone before hydrolyzing to ammonia. At the higher N rates AN was still superior to U, but differences in yields were small. Averaged over all rates, yields of SCU sources decreased as solubility increased and the highest yields were obtained from SCU-20 (Fig. 11). A steady and consistent yield increase was obtained as rates increased through 400 lb N/acre in spite of only moderate yield levels for the season (Fig. 12).

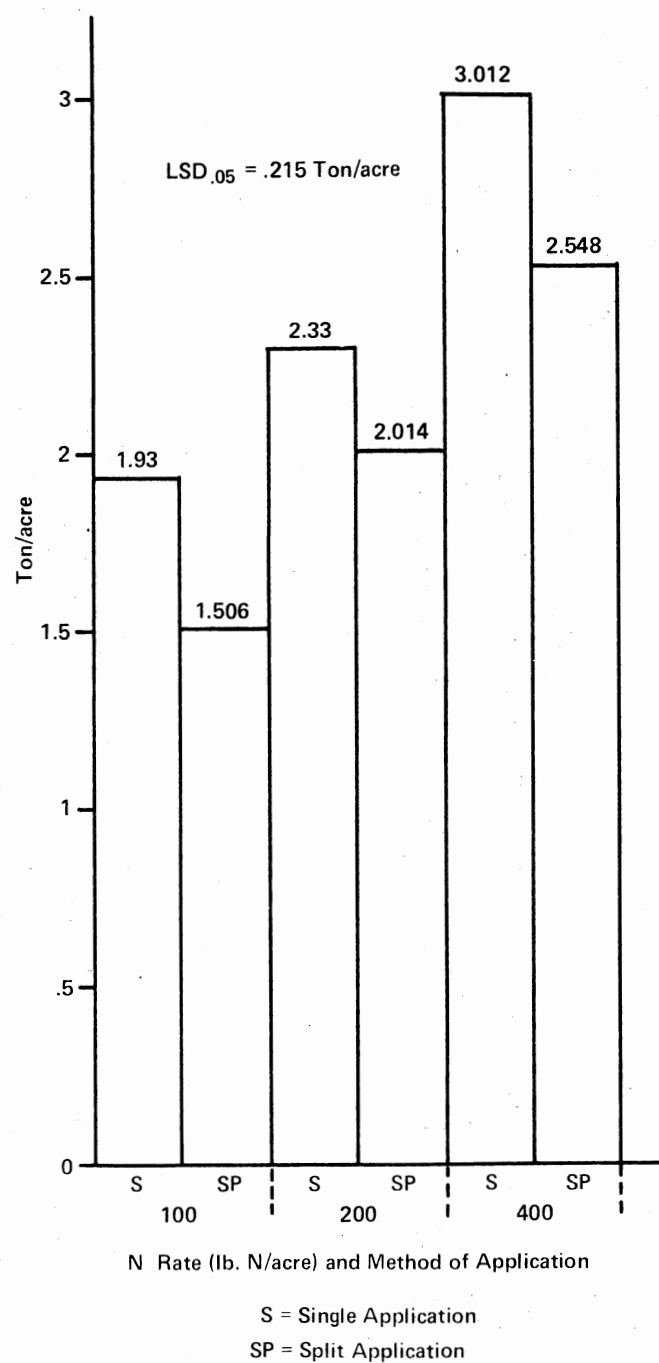


Figure 9. Bermudagrass Yields as Affected by Nitrogen Rates Applied as Single and Split Applications (Averaged Over Source), Exp. I (1972)

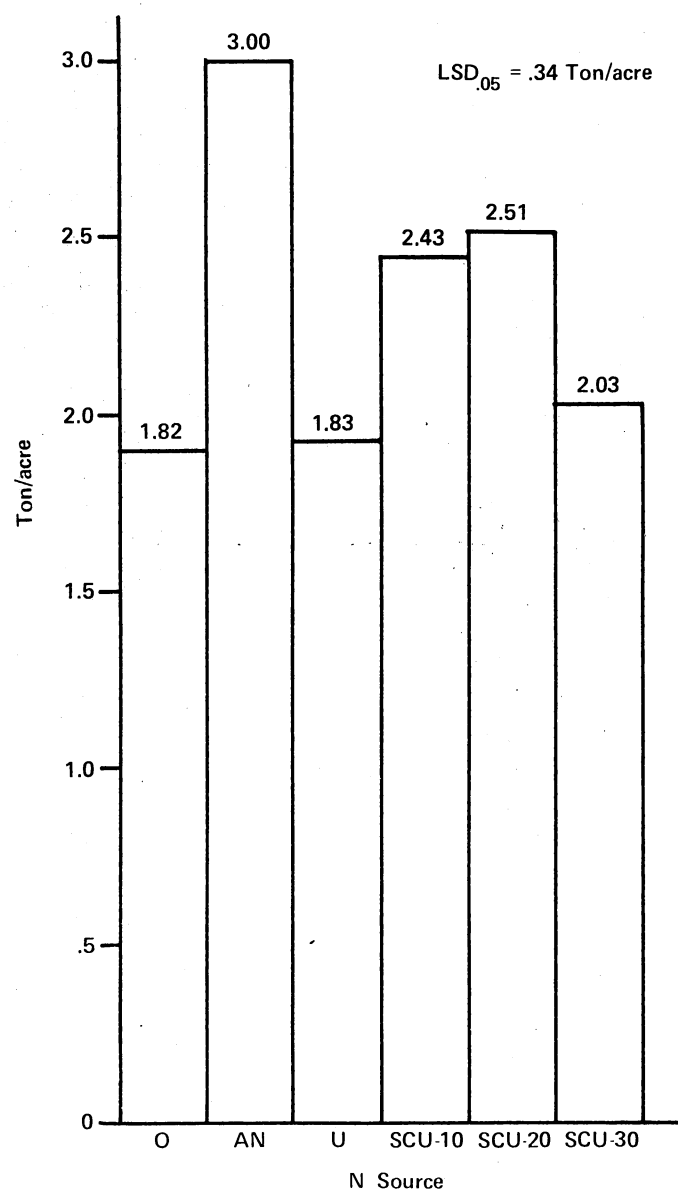


Figure 10. Bermudagrass Yields as Affected by Nitrogen Sources Applied at 50 lb N/Acre Compared to 0 N/Acre, Exp. I (1973)

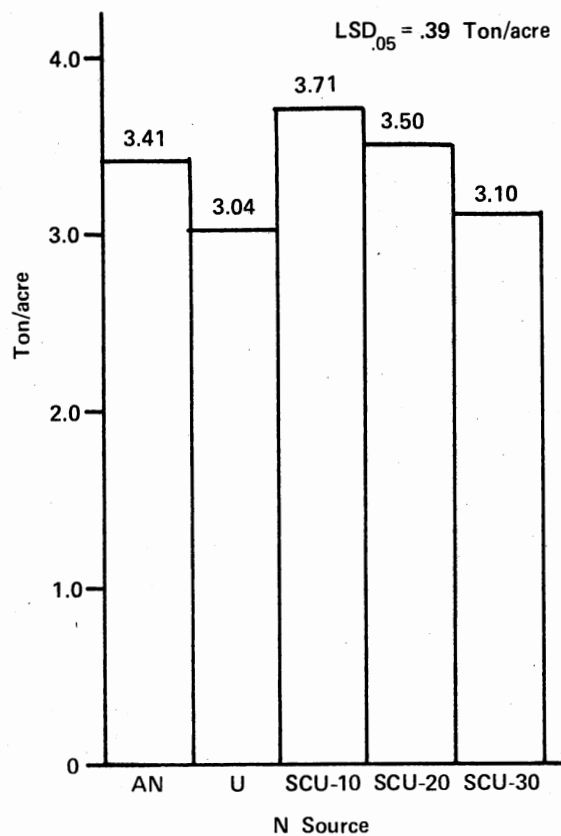


Figure 11. Bermudagrass Yields
as Affected by
Nitrogen Sources
(Averaged Over
Rate and Method of
Application),
Exp. I (1973)

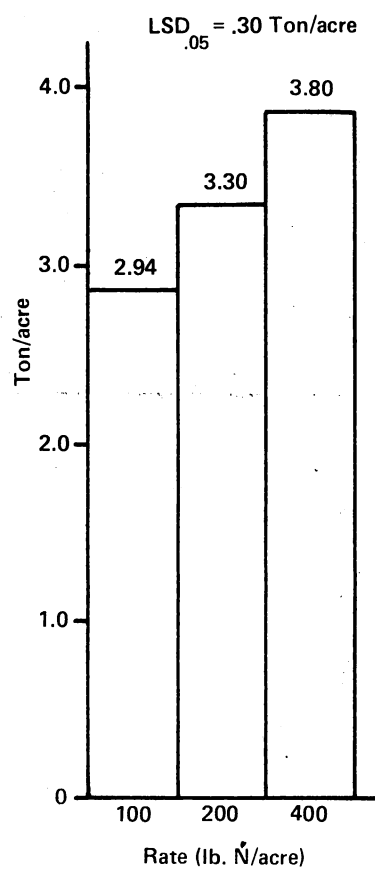


Figure 12. Bermudagrass
Yields as
Affected
by Nitrogen
Rates
(Averaged
Over Source
and Method
of Appli-
cation),
Exp. I
(1973)

Conclusions (Experiment I). Biuret was not an agronomically acceptable source of N. It was toxic to bermudagrass for four to six weeks after application. The grass renewed good growth after that period, but total season production was lower than for other sources. Measurements of residual N from B were disappointing.

Forage production from AN was generally greater than from U when single applications of 200 lb N/acre or greater was used. Split applications of the sources are more comparable. However, in 1973, the single application of 50 lb N/acre from U gave lower yields than AN at the same rate. Differences between AN and U were most obvious whenever conditions were favorable for maximum production.

The SCU sources gave comparable results upon continued application. They showed the desired characteristics of maintaining production throughout the growing season from a single application at the higher N rates. The dissolution rate of the SCU materials seemed not to be important upon continued use on the same plots.

Experiment II, Muskogee

The same sources were tested in this experiment as in Experiment I except only one dissolution rate of SCU (SCU-20) was used. The rate of N was 200 lb/acre applied as a single application and in four equal increments of 50 lb N/acre throughout the growing season.

Experiment II (1971). Percent N in bermudagrass forage for each treatment is given in Tables IV and VI. Pounds of N produced from bermudagrass forage by treatment are shown in Tables V and VII. Analyses of variance tables for bermudagrass production, percent N and lb N/acre

TABLE IV

BERMUDAGRASS FORAGE AS AFFECTED BY NITROGEN SOURCES AND METHOD
OF APPLICATION, EXP. II (1971)

SOURCE	RATE	APPLIED	Percent N in Forage			
			HAR. 1	HAR. 2	HAR. 3	HAR. 4
Check	0	0	1.01	1.29	1.40	0.98
B	200	2*	1.17	1.47	1.52	0.93
B	200	1**	2.11	1.45	1.63	1.00
B+U	200	2	1.36	2.58	1.95	1.15
B+U	200	1	2.21	1.66	1.55	0.98
B+U	200	2	1.35	1.81	1.53	1.10
B+U	200	1	2.28	1.65	1.75	1.08
AN	200	2	1.46	1.77	1.60	1.23
AN	200	1	2.10	1.42	1.50	0.95
U	200	2	1.39	1.70	1.50	1.18
U	200	1	1.92	1.24	1.38	0.95
SCU-20	200	2	1.11	1.41	1.48	1.25
SCU-20	200	1	1.40	1.42	1.55	1.35
LSD .05			.27	.26	.25	.18

* = Rate applied as split applications

** = Rate applied as a single application

TABLE V

POUNDS OF NITROGEN PRODUCED FROM BERMUDAGRASS FORAGE AS AFFECTED
BY NITROGEN SOURCES AND METHOD OF APPLICATION, EXP. II (1971)

SOURCE	RATE	APPLIED	Lb N/Acre				TOTAL	% Rec.
			HAR. 1	HAR. 2	HAR. 3	HAR. 4		
Check	0	0	13.231	3.148	4.928	7.938	29.245	
B	200	2*	22.075	7.034	8.480	12.270	49.860	10
B	200	1**	21.433	24.526	22.065	20.515	88.539	30
B+U	200	2	34.253	29.711	58.492	46.140	168.595	70
B+U	200	1	47.601	43.452	22.835	21.182	135.070	53
B+S	200	2	25.758	17.475	14.970	29.601	87.804	29
B+S	200	1	13.542	50.282	30.241	26.890	120.955	45
AN	200	2	49.818	37.346	22.784	45.700	155.648	63
AN	200	1	80.978	32.932	18.024	19.811	151.745	61
U	200	2	49.114	26.153	17.850	17.850	121.255	46

TABLE V (Continued)

SOURCE	RATE	APPLIED	Lb N/Acre				TOTAL	% REQ.
			HAR. 1	HAR. 2	HAR. 3	HAR. 4		
U	200	1	71.764	11.948	11.085	18.442	113.239	42
SCU-20	200	2	24.326	10.155	9.641	31.012	75.133	23
SCU-20	200	1	39.246	20.431	21.408	33.522	114.607	43

LSD .05 16.047 9.571 8.467 10.176 19.029

* = Rate applied as a split application

** = Rate applied as a single application

TABLE VI

PERCENT NITROGEN IN BERMUDAGRASS FORAGE AS AFFECTED BY NITROGEN
SOURCES (APPLIED AND RESIDUAL) AND METHOD OF
APPLICATION, EXP. II (1972)

SOURCE	RATE	APPLIED	Percent N in Forage	
			HAR. 1	HAR. 2
Check	0	0	.82	1.35
B	200	2R*	.78	1.74
B	200	1R**	.74	1.51
B+U	200	2R	.85	1.27
B+U	200	1R	.79	1.52
B+S	200	2R	.98	1.29
B+S	200	1R	.73	1.56
	LSD .05		.22	.47
AN	200	2	.80	1.82
AN	200	1	1.51	1.61
U	200	2	1.61	1.60
U	200	1	1.57	1.65
SCU-20	200	2	.70	2.20
SCU-20	200	1	1.31	1.89
	LSD .05		.67	.57

*Fertilizer not applied, forage harvested to recover residual nitrogen from split application from 1971

**Fertilizer not applied, forage harvested to recover residual nitrogen from single application from 1971

TABLE VII

POUNDS OF NITROGEN PRODUCED FROM BERMUDAGRASS FORAGE
AS AFFECTED BY NITROGEN SOURCES (APPLIED AND
RESIDUAL) AND METHOD OF APPLICATION,
EXP. II (1972)

SOURCE	RATE	APPLIED	Lb N/Acre		
			HAR. 1	HAR. 2	HAR. 3
Check	0	0	4.355	4.171	8.256
B	200	2R*	10.142	6.471	16.613
B	200	1R**	5.992	5.334	11.326
B+U	200	2R	9.884	5.428	15.312
B+U	200	1R	8.770	6.357	15.127
B+S	200	2R	15.828	5.921	20.749
B+S	200	1R	7.597	4.662	12.259
	LSD .05		6.762	1.903	7.294
AN	200	2	19.592	17.019	36.611
AN	200	1	51.440	15.423	66.863
U	200	2	42.948	18.267	61.215
U	200	1	51.192	13.023	64.215
SCU-20	200	2	18.774	21.483	40.257
SCU-20	200	1	40.692	19.950	60.642
	LSD .05		37.866	10.355	46.317

*Fertilizer not applied, forage harvested to recover residual nitrogen from split application from 1971

**Fertilizer not applied, forage harvested to recover residual nitrogen from single application from 1971

are presented in Appendix Tables VIII-XVIII. Forage production for 1971, as affected by treatments, is shown in Fig. 13. All sources significantly increased yields. The slow-release sources (B, B+S, and SCU-20) gave the highest yields when applied as single applications. Urea, B+U, and AN produced the best yields when applied in split applications. Here again, as in Exp. I, B and B+S yielded less than the no N treatment for the first harvest when applied as a single application.

The highest yields were obtained from the AN and B+U when the applications were split into 50 lb N/acre increments.

Experiment II (1972). The B sources were not reapplied in 1972 and 1973 but yields were measured to determine any residual N from applications made in 1971. As shown in Fig. 14, residual N from the B sources was present and resulted in increased yields over the check in 1972. No differences in yields were obtained among the sources applied in 1972.

Experiment II (1973). The 1973 yields are plotted for the 13 treatments in Fig. 15. The B sources applied in 1971 did not yield significantly higher than the check treatment indicating no carryover N from these sources into the third year for forage production.

Data from this study shows a very strong and important interaction between source and method of application. When 200 lb N/acre was applied as a single application, U was again inferior to AN, but whenever the applications were split into four 50 lb N/acre increments, U increased yields more than AN. The SCU-20 was again a satisfactory and comparable source of N.

The N contents of the forage were quite low for this study but recoverable N was high during the 1971 season averaging more than 40 percent.

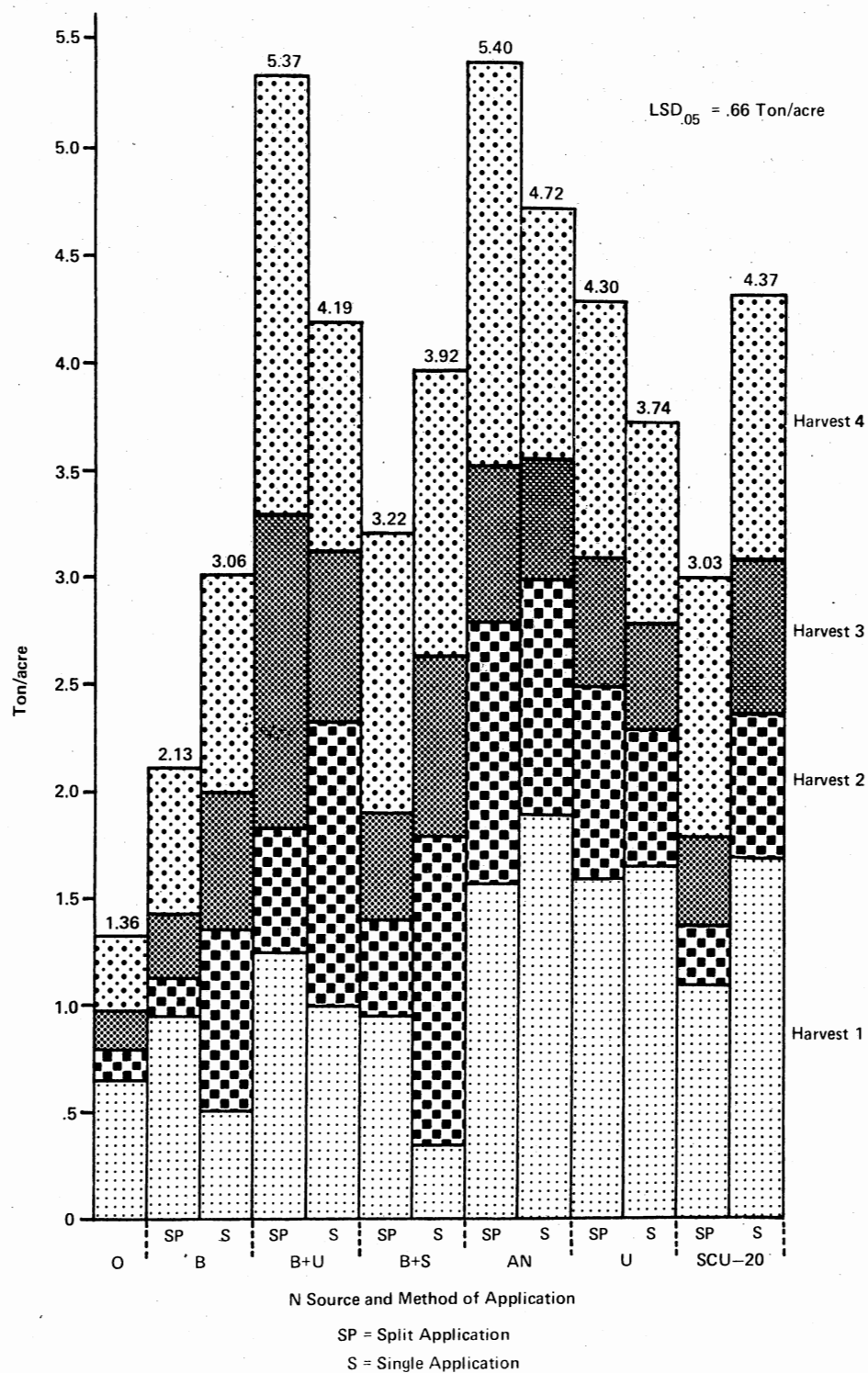


Figure 13. Bermudagrass Yields as Affected by Nitrogen Sources and Method of Application, Exp. II (1971)

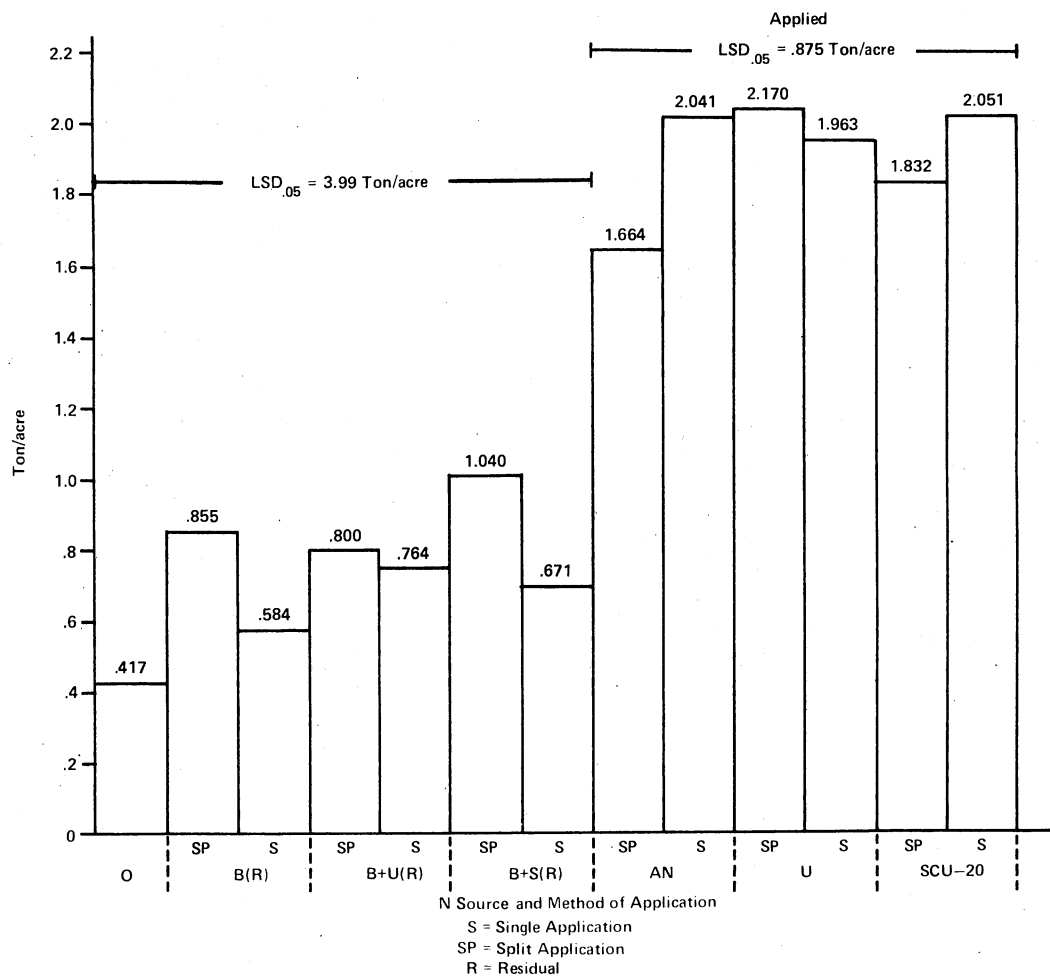


Figure 14. Bermudagrass Yields as Affected by Nitrogen Sources (Applied and Residual) and Method of Application, Exp. II (1972)

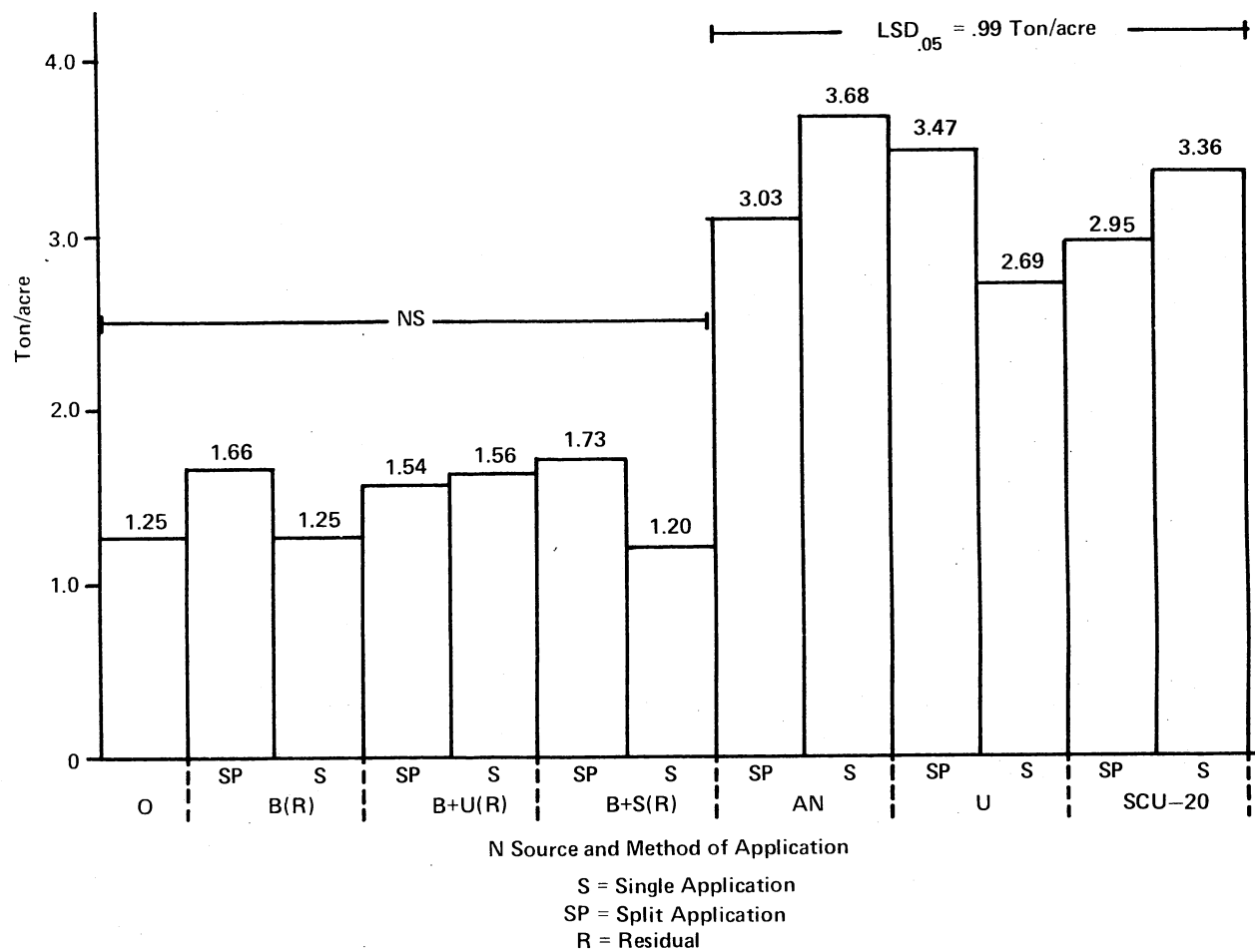


Figure 15. Bermudagrass Yields as Affected by Nitrogen Sources (Applied and Residual) and Method of Application, Exp. II (1973)

The calculations in Table V were based upon recoveries after subtracting the total contents from the forage produced without added N. Nitrogen recoveries were highest from the B+U. Why this particular treatment gives such high recoveries is not known. Nitrogen recovery from AN was higher than from U. Recovery of N from SCU-20 is less when applications were split compared to a single application.

Conclusions (Experiment II). Over the three year period U averaged 17% less forage production than AN when applied as a single application. Whenever applications were split, yield differences between U and AN were small. Whenever soil moisture was distributed uniformly throughout the summer, both AN and U produced the highest yields by splitting the applications, but whenever moisture was severely limiting during the summer, single applications of AN produced the highest total yields. As noted from Exp. I, large single applications of U tended to be inefficient. In some cases, U tended to yield less than AN for the first harvest, but unused U was effective in producing more forage for the second harvest. This would probably indicate a lack of nitrification early in the season. The SCU-20 produced higher total yields when applied as a single application at the beginning of the growing season. There was some carryover N as measured by crop yields from the B treatments into the second year but these dissipated by the third year.

Experiment III, Mangum

This test was identical to Exp. I except only one source of SCU was used and B+S was deleted. Soil moisture was limiting in both years and total yields were quite low.

Experiment III (1971). Forage production is shown graphically in Fig. 16, 17 and 18. In Fig. 16, pooled data for sources are given at the 50 lb N/acre rate. The ranking of total forage yield was: B+U < B = SCU-30 < AN = U.

The sources were compared for the 1971 season pooling split and single applications in Fig. 17, and AN produced the highest yield followed by U and SCU-30 which out yielded the B treatments. Breaking these data down into split and single applications for the 100, 200 and 400 lb N/acre rate as shown in Fig. 18, reveals that AN was superior to U when applied all at once. When split, U compared favorably with AN at the higher rates of application. The SCU-30 performed nearly as well as the soluble sources.

Averaging data for all rates over all sources revealed significant yield increases with increasing N rates. The average yield for each rate is 0.897, 1.339 and 1.697 tons of forage per acre for the 100, 200 and 400 lb N/acre rate respectively.

The means for each treatment in this experiment are reported in Appendix Tables XLII and LII. Nitrogen recoveries from each source were: AN (24%), U (18%), SCU (17%), B (10%) and B+U (6.5%).

Experiment III (1972). Yields were obtained for only one harvest due to dry weather. The plots were lost in 1973 due to a residence being built on the experimental site. No B nor B+U were applied in 1972. In Fig. 19, yields of the sources are compared at 50 lb N/acre rate except for B and B+U which were residual for 1972.

As can be seen in Fig. 20, the available residual N increased as the rate of B increased. Biuret applied at 400 lb N/acre in 1971, as a split application, gave comparable yields to AN and U applied in 1972

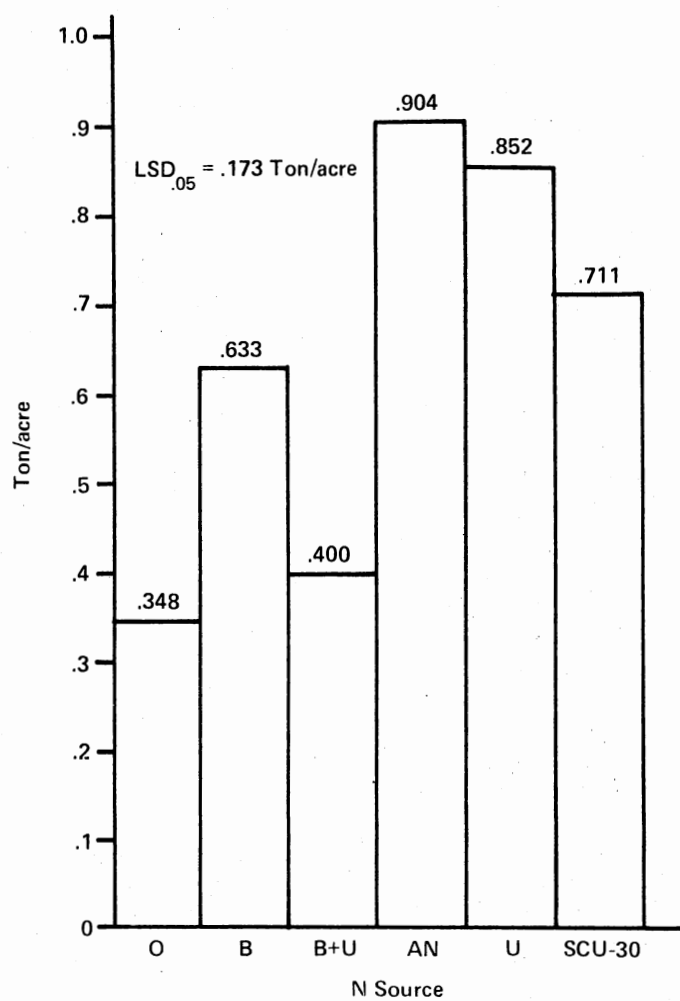


Figure 16. Bermudagrass Yields as Affected by Nitrogen Sources Applied at 50 lb N/Acre, Exp. III (1971)

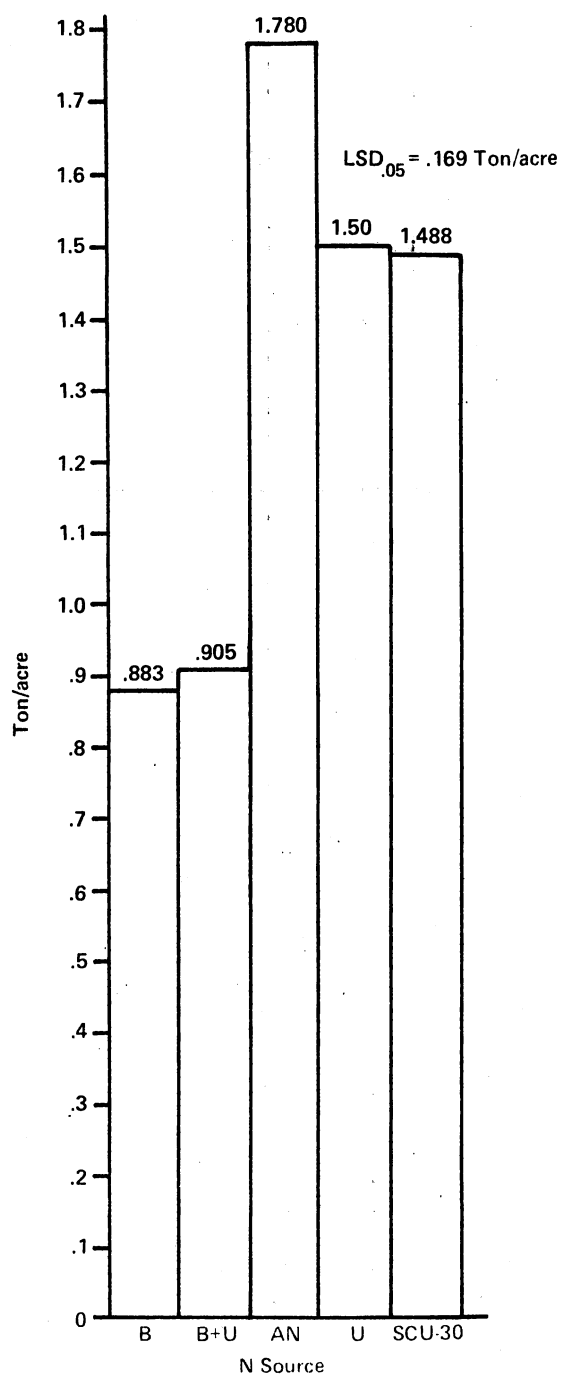


Figure 17. Bermudagrass Yields as Affected by Nitrogen Sources (Averaged Over Rate and Method of Application), Exp. III (1971)

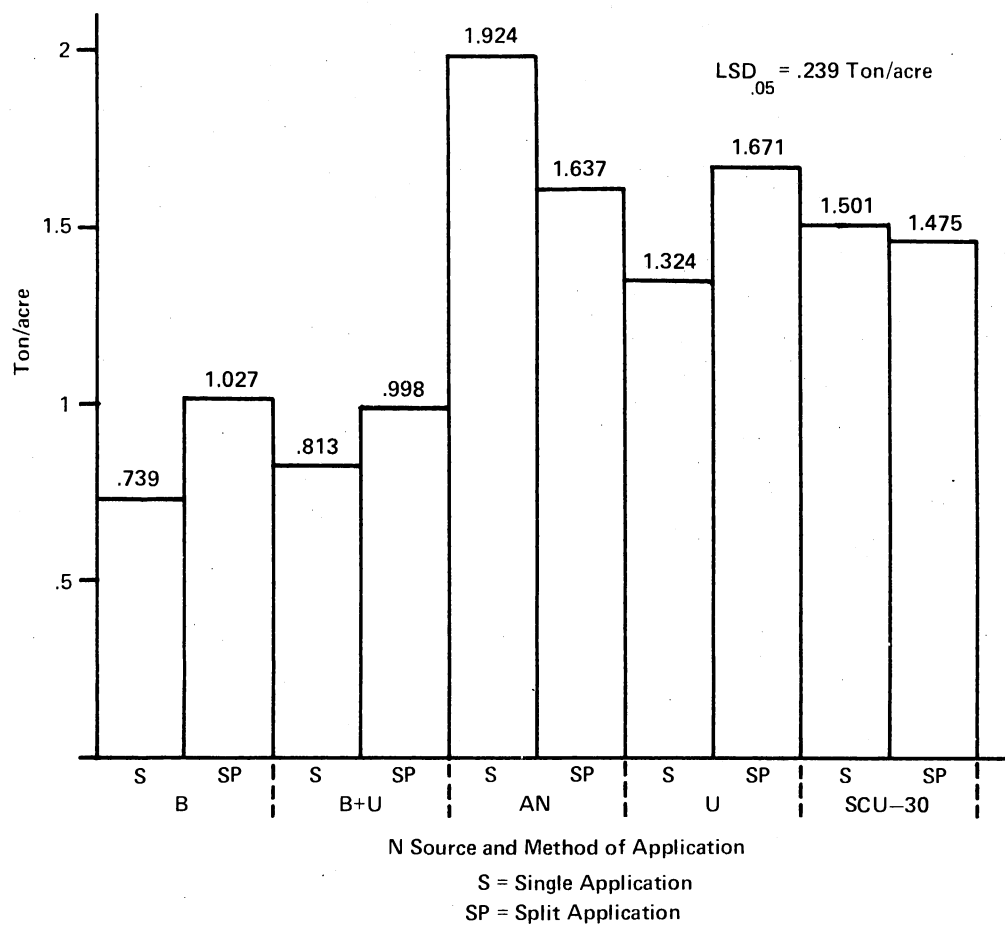


Figure 18. Bermudagrass Yields as Affected by Nitrogen Sources and Method of Application (Averaged Over Rate), Exp. III (1971)

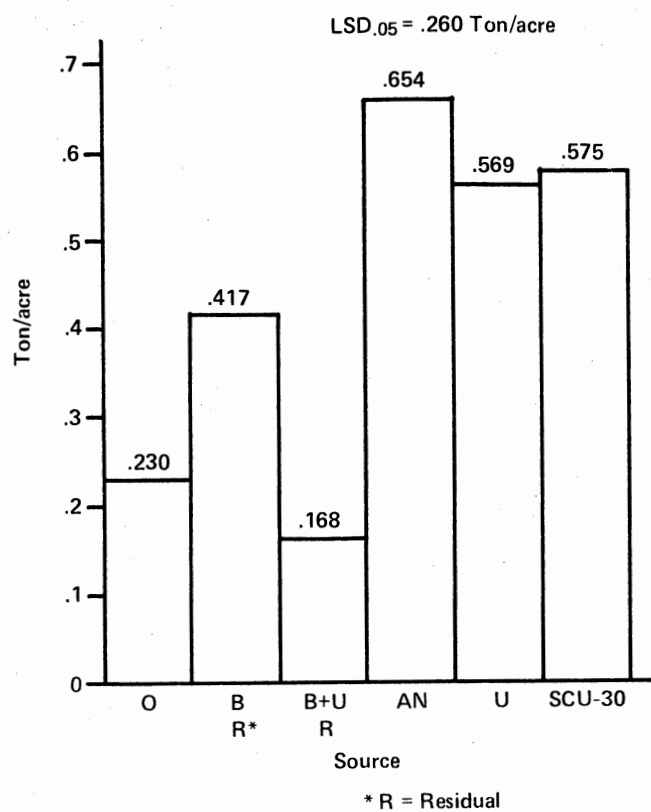


Figure 19. Bermudagrass Yields as Affected by Nitrogen Sources (Applied and Residual) at 50 lb N/Acre, Exp. III (1972)

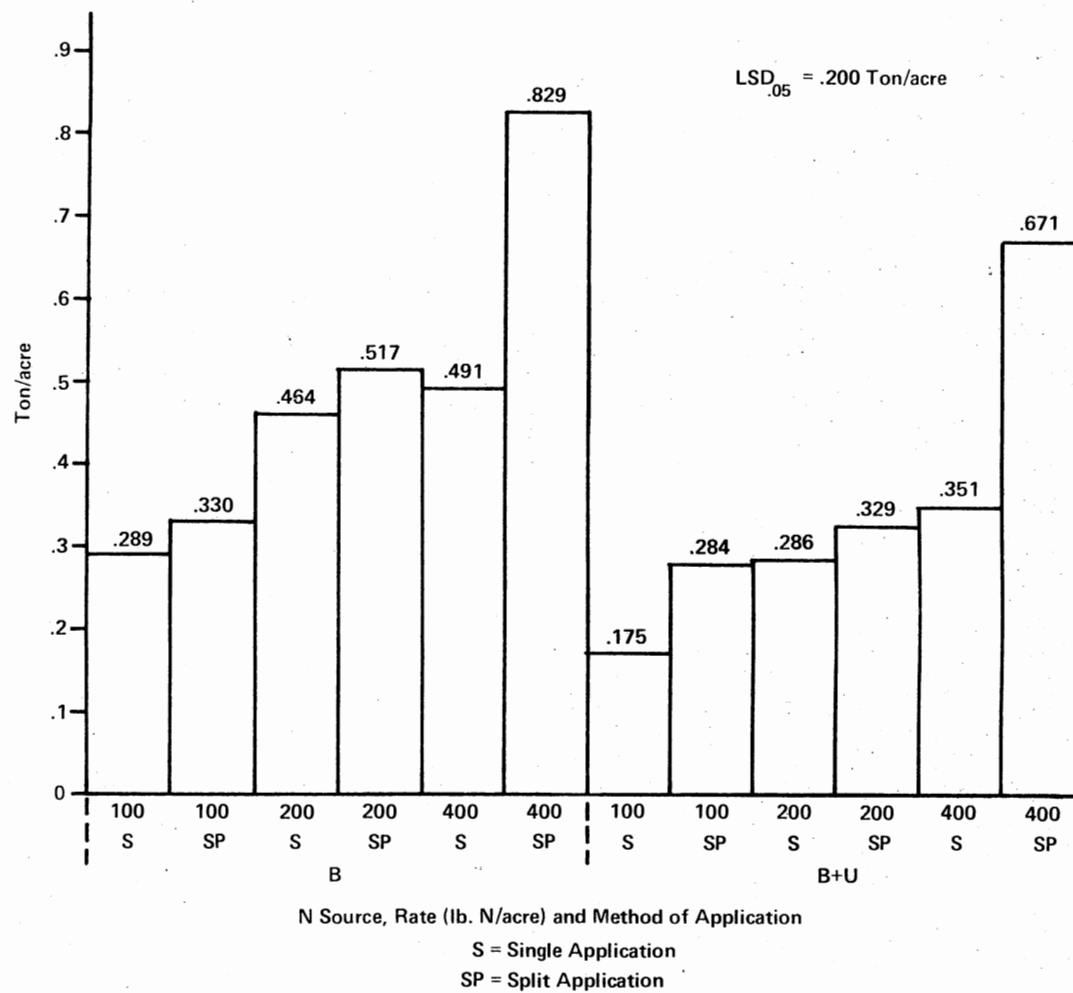


Figure 20. Bermudagrass Yields as Affected by Residual B and B+U, Exp. III (1972)

at 50 lb N/acre. Only the 400 lb N/acre as B+U applied as a split application in 1971 showed any evidence of available residual N for forage production in 1972.

Yields from AN, U and SCU-30, which were applied in 1972, showed no significant differences from being applied as single or split applications. In Fig. 21, the yields from each source when applied at 100, 200 and 400 lb N/acre are shown. These data are the average of both single and split applications. Ammonium nitrate and U had no significant yield increases to additional N above the 100 lb N/acre rate. The yields from SCU-30, show a definite increase as the N rate increased, but it was not greater than AN or U. Yields from the 400 lb rate were significantly greater than yields from the 100 lb N/acre rate.

Means for each treatment on percent N in the forage is given in Appendix Tables XLVI and LII, and for lb N/acre produced from bermudagrass forage in Appendix Tables XLIX and LII. Analyses of variance tables for bermudagrass yields, percent N in forage and lb N/acre from forage are shown in Appendix Tables XLIV, XLV, XLVII, XLVIII, L, LI, LIII-LXI.

Conclusions (Experiment III). The bermudagrass did not exhibit severe toxicity due to B at this location. The high rates of B and B+U did remain as residual N available for forage production the second year, as shown by forage production and lb N/acre produced in the forage.

Again, in this test, AN produced higher forage yields than U when large single applications were used, but yields from both sources were essentially the same whenever single application rates were not too large (above 100 lb N/acre).

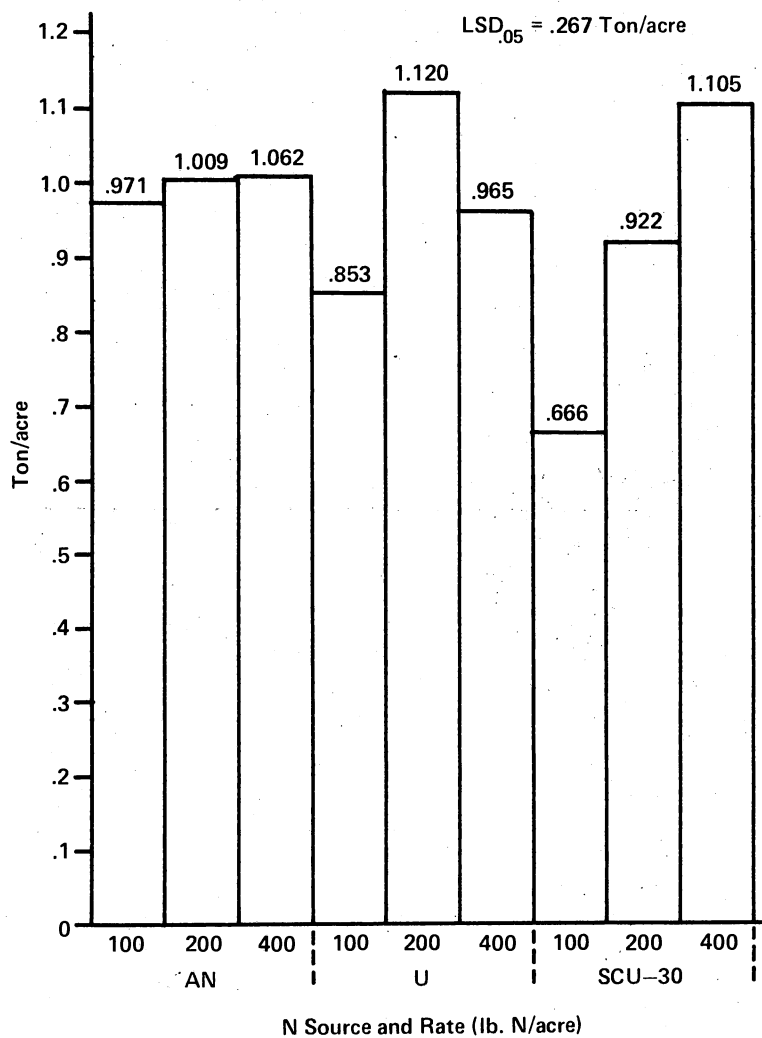


Figure 21. Bermudagrass Yields as Affected by Nitrogen Sources and Rates (Averaged Over Method of Application), Exp. III (1972)

Experiment IV, Stillwater

This experiment was conducted in 1971, after which the location was lost to highway construction. Soil moisture was limiting at this location but not as severe as at the Exp. III location.

Sources of N are compared at the 50 lb N/acre rate in Fig. 22. Yields were significantly increased by 50 lb N/acre, but no differences were measured between sources. When the forage production was averaged over the higher rates (100, 200, 400 lb/acre) and application methods there were significant differences between sources. The order of production from sources is $B < B+U < SCU-30 = U = AN$. Only the treatments produced significantly lower yields. The SCU-30 and soluble sources produced equal yields.

The average yields of single and split applications for each source and rate are presented in Fig. 23. Total production decreased as rate of B increased. The same trend was apparent from the first harvest for the B+U treatment. However, there was no significant difference in total production from any rate of B+U. Production from AN, U and SCU-30 increased as rate of N increases.

Nitrogen recovery was greatest at the 50 lb N/acre rate for all sources, and as rate increased the percentage recovery decreased.

Bermudagrass yields are tabulated by treatment in Appendix Table LXII, and analyses of variance for the yields are given in Appendix Tables LXIII and LXIV. Percent N in bermudagrass forage is tabulated in Appendix Table LXV, and analyses of variance in Appendix Tables LXVI and LXVII.

Data on the lb N/acre from the bermudagrass forage is presented in Appendix Table LXVIII, and analyses of variance in Appendix Tables

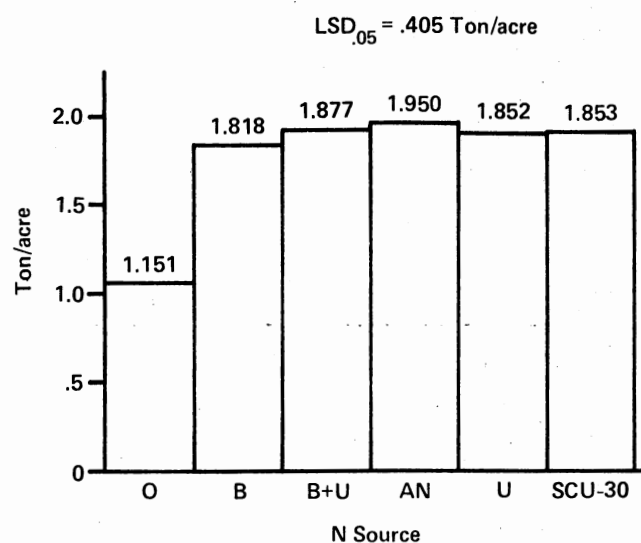


Figure 22. Bermudagrass Yields as Affected by Nitrogen Sources Applied at 50 lb N/Acre, Exp. IV (1971)

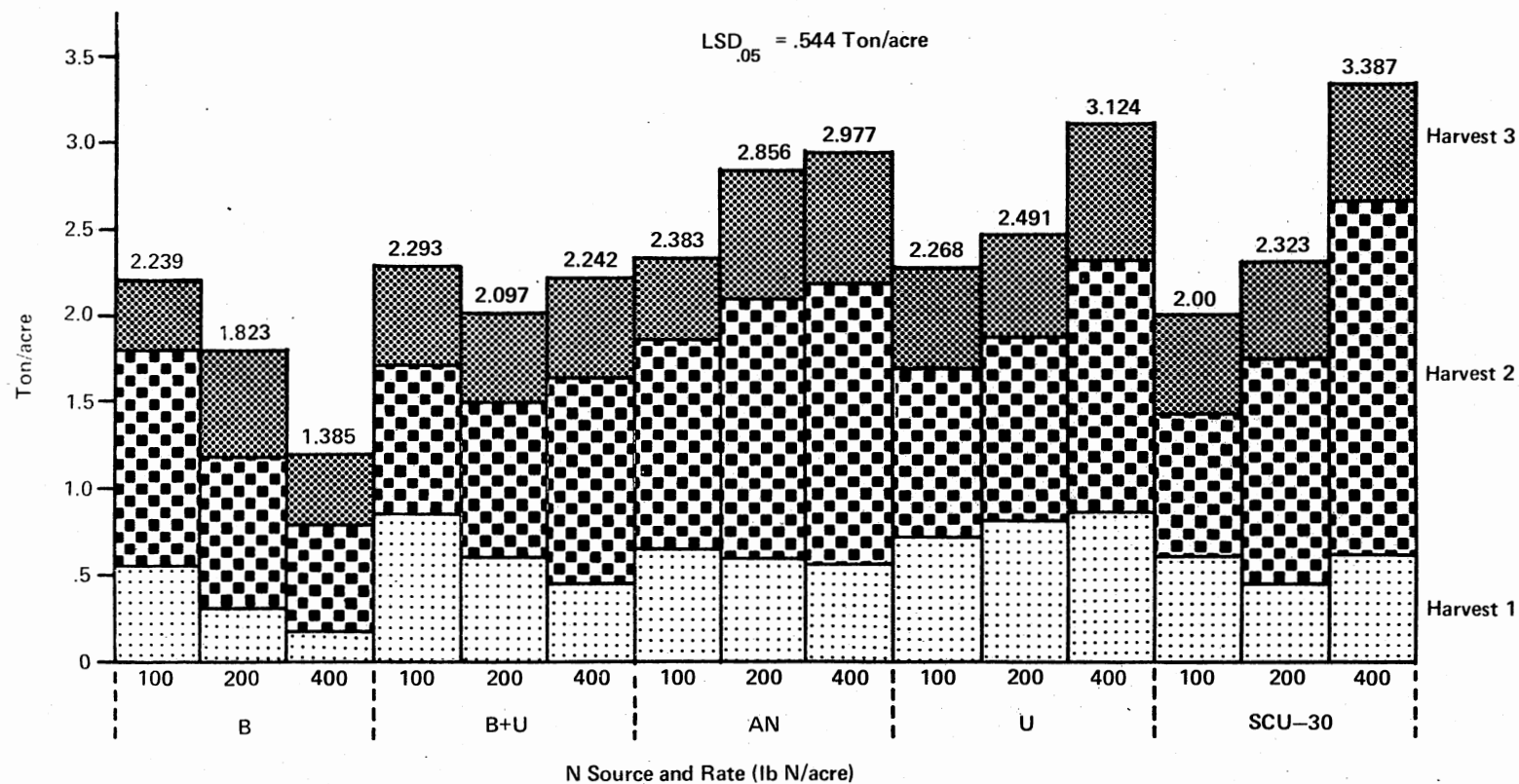


Figure 23. Bermudagrass Yields as Affected by Nitrogen Sources and Rates (Averaged Over Method of Application), Exp. IV (1971)

LXIX and LXX.

Conclusion (Experiment IV). The B sources did show toxicity to the bermudagrass at the 200 lb N/acre rate and above. Yields from AN, U and SCU-30 increased as the rate increased, but the percentage of applied N recovered by the forage decreased as the rate of N increased.

CHAPTER V

SUMMARY

Biuret was toxic to bermudagrass at rates exceeding 100 lb N/acre when applied in single applications. The toxicity was most severe when soil moisture was high and conditions favorable for rapid growth. The most severe damage from B occurred in Exp. I where the 400 lb N/acre applied as a single application sterilized the soil for approximately 90 days. After 90 days annual grasses invaded the plots. In Exp. III and IV the bermudagrass was not killed by the high rates of B, but growth was retarded and seasonal yields reduced. There was a noticeable "greenup" of the forage fertilized with B approximately 90 days after application indicating a transformation of B into usable forms of N for plant growth.

Sulfur-coated urea showed promise as a source of N for bermudagrass forage production and maintaining good quality forage throughout the growing season. Second and third year treatments of SCU performed better than the first year treatments. Plots fertilized with SCU remained green longer in the fall and recovered earlier in the spring than those fertilized with other sources.

Comparisons of AN and U revealed that AN was, in general, superior to U whenever rates above 100 lb N/acre were applied in single applications. Split applications of U produced yields comparable to AN if applied at 100 lb N/acre increments or lower. The reduction in yield

from U is attributed primarily to a loss of N by volatilization whenever rates above 100 lb N/acre were applied in single applications.

This loss was most evident in Exp. I and II in 1971, when the fertilizer was applied to a very wet soil and subsequent conditions were favorable for high yields.

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APPENDIX

TABLE VIII

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT OF
NITROGEN SOURCES AND METHOD OF APPLICATION, EXP. II (1971)

Har. 1

SOURCE	df	MS	F	OSL%*
REP	3	0.202061	4.31	1.13
SOURCE	5	2.105426	44.94	0.01
METHOD	1	0.036576	0.78	61.29
SOURCE * METHOD	5	0.427477	9.12	0.01
ERROR	33	0.046854	-----	-----
TOTAL	47	0.316031	-----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.188876	5.36	0.43
SOURCE	5	0.522302	14.83	0.01
METHOD	1	2.077504	59.00	0.01
SOURCE * METHOD	5	0.447855	12.72	0.01
ERROR	33	0.035209	-----	-----
TOTAL	47	0.184188	-----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	3	0.010255	0.54	65.90
SOURCE	5	0.469035	24.92	0.01
METHOD	1	0.001355	0.07	78.62
SOURCE * METHOD	5	0.425266	22.59	0.01
ERROR	33	0.018825	-----	-----
TOTAL	47	0.019039	-----	-----

Har. 4

SOURCE	df	MS	F	OSL%
REP	3	0.038597	0.58	63.90
SOURCE	5	0.518989	7.74	0.02
METHOD	1	0.926852	13.82	0.10
SOURCE * METHOD	5	0.542855	8.09	0.01
ERROR	33	0.067070	-----	-----
TOTAL	47	0.182238	-----	-----

TABLE VIII (Continued)

Total

SOURCE	df	MS	F	OSL%
REP	3	0.688868	3.25	3.34
SOURCE	5	6.332985	29.90	0.01
METHOD	1	0.105094	0.50	50.71
SOURCE * METHOD	5	2.113389	9.98	0.01
ERROR	33	0.211828	-----	-----
TOTAL	47	1.093487	-----	-----

*OSL% = Observed Significance Level as a Percentage

TABLE IX

ANALYSIS OF VARIANCE ON PERCENT NITROGEN IN BERMUDAGRASS
FORAGE FOR THE EFFECT OF NITROGEN SOURCES AND
METHOD OF APPLICATION, EXP. II (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.003173	0.09	96.53
SOURCE	5	0.341389	9.47	0.01
METHOD	1	6.122806	169.82	0.01
SOURCE * METHOD	5	0.064562	1.79	14.24
ERROR	33	0.036454	-----	-----
TOTAL	47	0.202517	-----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.135991	4.25	1.21
SOURCE	5	0.562862	17.49	0.01
METHOD	1	1.200169	37.49	0.01
SOURCE * METHOD	5	0.242899	7.59	0.02
ERROR	33	0.032011	-----	-----
TOTAL	47	0.142411	-----	-----

TABLE IX (Continued)

Har. 3

SOURCE	df	MS	F	OSL%
REP	3	0.040208	1.33	28.03
SOURCE	5	0.092708	3.07	2.18
METHOD	1	0.016875	0.56	53.35
SOURCE * METHOD	5	0.097375	3.22	1.76
ERROR	33	0.030208	-----	-----
TOTAL	47	0.044357	-----	-----

Har. 4

SOURCE	df	MS	F	OSL%
REP	3	0.001319	0.09	96.62
SOURCE	5	0.098875	6.48	0.04
METHOD	1	0.091875	6.02	1.86
SOURCE * METHOD	5	0.050875	3.33	1.51
ERROR	33	0.015258	-----	-----
TOTAL	47	0.028684	-----	-----

TABLE X

ANALYSIS OF VARIANCE ON POUNDS OF NITROGEN PRODUCED FROM BERMUDAGRASS
FORAGE FOR THE EFFECT OF NITROGEN SOURCES AND METHOD
OF APPLICATION, EXP. II (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	376.82222	3.03	4.23
SOURCE	5	3005.02959	24.16	0.01
METHOD	1	1597.11075	12.84	0.14
SOURCE * METHOD	5	494.32121	3.97	0.64
ERROR	33	124.36639	-----	-----
TOTAL	47	517.62600	-----	-----

TABLE X. (Continued)

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	255.04634	5.76	0.31
SOURCE	5	839.87320	18.98	0.01
METHOD	1	1034.07050	23.37	0.01
SOURCE * METHOD	5	552.36376	12.49	0.01
ERROR	33	44.24139	-----	-----
TOTAL	47	217.45447	-----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	3	0.806973	0.02	99.47
SOURCE	5	789.774824	22.80	0.01
METHOD	1	14.335788	0.41	53.12
SOURCE * METHOD	5	755.551001	21.82	0.01
ERROR	33	34.624866	-----	-----
TOTAL	47	189.063966	-----	-----

Har. 4

SOURCE	df	MS	F	OSL%
REP	3	20.689314	0.41	74.76
SOURCE	5	367.247661	7.34	0.02
METHOD	1	918.715000	18.37	0.03
SOURCE * METHOD	5	403.767349	8.07	0.01
ERROR	33	50.006260	-----	-----
TOTAL	47	138.001374	-----	-----

Total

SOURCE	df	MS	F	OSL%
REP	3	1182.95367	6.76	0.14
SOURCE	5	8759.28975	50.09	0.01
METHOD	1	1445.84434	8127.	0.70
SOURCE * METHOD	5	1853.51728	10.60	0.01
ERROR	33	174.84440	-----	-----
TOTAL	47	1358.07650	-----	-----

TABLE XI

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT OF APPLIED
NITROGEN SOURCES AND METHOD OF APPLICATION, EXP. II (1972)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.136801	0.75	53.96
SOURCE	2	0.131337	0.72	50.50
METHOD	1	0.193667	1.07	31.91
SOURCE * METHOD	2	0.058558	0.32	73.30
ERROR	15	0.181521	-----	-----
TOTAL	23	0.161159	-----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.322576	9.44	0.12
SOURCE	2	0.008080	0.24	79.45
METHOD	1	0.014811	0.43	52.66
SOURCE * METHOD	2	0.038346	1.12	35.26
ERROR	15	0.034185	-----	-----
TOTAL	23	0.069050	-----	-----

Total

SOURCE	df	MS	F	OSL%
REP	3	0.866196	2.57	9.26
SOURCE	2	0.092429	0.27	76.70
METHOD	1	0.101364	0.30	59.74
SOURCE * METHOD	2	0.182218	0.54	59.83
ERROR	15	0.337411	-----	-----
TOTAL	23	0.361323	-----	-----

TABLE XII

ANALYSIS OF VARIANCE ON PERCENT NITROGEN IN BERMUDAGRASS FORAGE
FOR THE EFFECT OF APPLIED NITROGEN SOURCES AND
METHOD OF APPLICATION, EXP. II (1972)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.043715	0.22	88.03
SOURCE	2	0.270579	1.37	28.43
METHOD	1	1.989504	10.06	0.63
SOURCE * METHOD	2	0.045529	0.23	79.90
ERROR	15	0.197728	-----	-----
TOTAL	23	0.248643	-----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.159739	1.13	37.05
SOURCE	2	0.390404	2.75	9.46
METHOD	1	0.144150	1.02	33.09
SOURCE * METHOD	2	0.070363	0.50	62.33
ERROR	15	0.141806	-----	-----
TOTAL	23	0.159651	-----	-----

TABLE XIII

ANALYSIS OF VARIANCE ON POUNDS OF NITROGEN PRODUCED FROM BERMUDAGRASS
FORAGE FOR THE EFFECT OF APPLIED NITROGEN SOURCES AND
METHOD OF APPLICATION, EXP. II (1972)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	150.06650	0.24	86.91
SOURCE	2	623.31242	0.99	60.23
METHOD	1	2563.46768	4.06	5.96
SOURCE * METHOD	2	280.92250	0.44	65.39
ERROR	15	631.49082	-----	-----
TOTAL	23	621.49997	-----	-----

TABLE XIII (Continued)

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	321.052971	6.80	0.44
SOURCE	2	61.683121	1.31	29.99
METHOD	1	46.727640	0.99	66.30
SOURCE * METHOD	2	9.025575	0.19	82.90
ERROR	15	47.219846	----	----
TOTAL	23	80.582245	----	----

Total

SOURCE	df	MS	F	OSL%
REP	3	843.24060	0.89	53.02
SOURCE	2	363.45597	0.38	69.17
METHOD	1	1917.99652	0.40	68.00
SOURCE * METHOD	2	388.75852	----	----
ERROR	15	944.83850	----	----
TOTAL	23	874.29238	----	----

TABLE XIV

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT OF
RESIDUAL BIURET TREATMENTS, EXP. II (1972)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.061819	0.95	56.15
TRT	6	0.121647	1.87	14.09
ERROR	18	0.064959	----	----
TOTAL	27	0.077207	----	----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.005612	3.19	4.79
TRT	6	0.004455	2.53	5.86
ERROR	18	0.001759	----	----
TOTAL	27	0.002786	----	----

TABLE XIV (Continued)

Total

SOURCE	df	MS	F	OSL%
REP	3	0.073663	1.02	40.67
TRT	6	0.160560	2.23	8.71
ERROR	18	0.071952	----	----
TOTAL	27	0.091833	----	----

TABLE XV

ANALYSIS OF VARIANCE ON PERCENT NITROGEN IN BERMUDAGRASS FORAGE FOR THE
EFFECT OF RESIDUAL BIURET TREATMENTS, EXP. II (1972)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.019414	0.93	54.97
TRT	6	0.029512	1.41	26.49
ERROR	18	0.020964	----	----
TOTAL	27	0.022692	----	----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.080537	0.81	50.78
TRT	6	0.113732	1.14	37.87
ERROR	18	0.099581	----	----
TOTAL	27	0.100609	----	----

TABLE XVI

ANALYSIS OF VARIANCE ON POUNDS OF NITROGEN PRODUCED FROM
BERMUDAGRASS FORAGE FOR THE EFFECT OF RESIDUAL
BIURET TREATMENTS, EXP. II (1972)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	10.637904	0.51	68.16
TRT	6	54.216627	2.62	5.26
ERROR	18	20.716903	----	----
TOTAL	27	27.041397	----	----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	4.740313	2.89	6.32
TRT	6	2.902735	0.77	16.21
ERROR	18	1.640405	----	----
TOTAL	27	2.265357	----	----

Total..

SOURCE	df	MS	F	OSL%
REP	3	16.571891	0.69	57.43
TRT	6	72.534802	3.01	3.21
ERROR	18	24.108688	----	----
TOTAL	27	34.032625	----	----

TABLE XVII

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT OF APPLIED
NITROGEN SOURCES AND METHOD OF APPLICATION, EXP. II (1973)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.241462	1.41	27.85
TRT	5	0.742563	4.33	1.23
ERROR	15	0.171334	----	----
TOTAL	23	0.304661	----	----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.474638	4.96	1.37
TRT	5	0.325053	3.40	2.96
ERROR	15	0.095666	----	----
TOTAL	23	0.194964	----	----

Total

SOURCE	df	MS	F	OSL%
REP	3	0.998535	2.29	11.91
TRT	5	0.541338	1.24	33.79
ERROR	15	0.435627	----	----
TOTAL	23	0.532030	----	----

TABLE XVIII

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT
OF RESIDUAL BIURET TREATMENTS, EXP. II (1973)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.023265	0.23	87.16
TRT	6	0.123040	1.24	33.26
ERROR	18	0.099298	----	----
TOTAL	27	0.096125	----	----

TABLE XVIII (Continued)

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.171923	5.82	0.60
TRT	6	0.040714	1.38	27.52
ERROR	18	0.029517	----	-----
TOTAL	27	0.47828	----	-----

Total

SOURCE	df	MS	F	OSL%
REP	3	0.132260	0.90	53.61
TRT	6	0.189586	1.29	31.22
ERROR	18	0.147413	----	-----
TOTAL	27	0.155101	----	-----

TABLE XIX

BERMUDAGRASS YIELDS AS AFFECTED BY NITROGEN SOURCES, RATES AND
METHOD OF APPLICATION, EXP. I (1971)

SOURCE	RATE	METHOD	HAR. 1	HAR. 2	Yield		TOTAL
					Ton/Acre (dry weight)		
Check	0	0	0.542	0.291	0.169	0.359	1.361
B	50	1*	0.740	0.244	0.250	0.340	1.574
B+U	50	1	0.761	0.164	0.210	0.415	1.550
B+S	50	1	0.682	0.360	0.362	0.430	1.834
AN	50	1	1.366	0.237	0.203	0.412	2.218
U	50	1	1.298	0.218	0.219	0.509	2.244
SCU-10	50	1	0.809	0.230	0.239	0.485	1.763
SCU-20	50	1	0.876	0.219	0.259	0.483	1.837
SCU-30	50	1	0.981	0.196	0.279	0.471	1.927
B	100	1	0.266	1.350	0.815	0.988	3.419
B	100	2**	0.661	0.509	0.317	0.331	1.818
B	200	1	0.251	0.956	1.047	1.397	3.651
B	200	2	0.550	0.527	0.540	0.801	2.419
B	400	1	0.101	0.356	1.002	1.372	2.831
B	400	2	0.463	0.425	0.784	1.305	2.977
B+U	100	1	0.796	0.196	0.225	0.365	1.582
B+U	100	2	0.768	0.518	0.546	0.720	2.552

TABLE XIX (Continued)

SOURCE	RATE	METHOD	HAR. 1	Yield			TOTAL
				Ton/Acre (dry weight)			
B+U	200	1	0.971	0.415	0.337	0.505	2.228
B+U	200	2	0.614	0.951	1.045	1.086	3.696
B+U	400	1	0.407	1.268	1.039	1.273	3.987
B+U	400	2	0.841	1.489	1.405	2.058	5.793
B+S	100	1	0.507	0.547	0.473	0.585	2.112
B+S	100	2	0.615	0.234	0.426	0.803	2.078
B+S	200	1	0.308	1.038	0.681	1.277	3.304
B+S	200	2	0.492	0.212	0.654	0.989	2.347
B+S	400	1	0.057	0.872	1.279	1.625	3.833
B+S	400	2	0.408	0.340	1.055	1.409	3.212
AN	100	1	1.927	0.332	0.329	0.459	3.047
AN	100	2	1.309	0.477	0.432	0.620	2.838
AN	200	1	1.914	1.673	0.738	1.223	5.548
AN	200	2	1.537	1.313	1.020	0.886	4.756
AN	400	1	1.767	1.882	0.986	1.777	6.412
AN	400	2	1.741	1.902	1.304	1.607	6.554
U	100	1	1.753	0.267	0.313	0.631	2.964
U	100	2	1.344	0.759	0.972	0.963	4.038
U	200	1	2.169	0.276	0.290	0.478	3.213
U	200	2	1.413	0.953	0.995	0.902	4.263
U	400	1	2.026	0.876	0.546	0.599	4.047
U	400	2	1.550	1.783	1.129	1.886	6.348
SCU-10	100	1	1.184	0.365	0.383	0.725	2.657
SCU-10	100	2	0.679	0.327	0.280	0.535	1.821
SCU-10	200	1	1.459	0.587	0.597	1.115	2.758
SCU-10	200	2	0.627	0.325	0.329	0.533	1.814
SCU-10	400	1	1.850	1.325	1.201	1.805	6.181
SCU-10	400	2	0.812	0.660	1.055	1.805	4.332
SCU-20	100	1	1.216	0.243	0.326	0.605	2.390
SCU-20	100	2	0.736	0.233	0.294	0.616	1.879
SCU-20	200	1	1.653	0.693	0.574	1.091	4.011
SCU-20	200	2	0.829	0.377	0.415	0.943	2.564
SCU-20	400	1	1.948	1.402	0.930	1.859	6.139
SCU-20	400	2	1.113	0.535	1.109	1.960	4.717
SCU-30	100	1	1.495	0.401	0.344	0.586	2.826
SCU-30	100	2	0.947	0.290	0.413	0.564	2.214
SCU-30	200	1	1.885	0.867	0.719	1.067	4.538
SCU-30	200	2	1.214	0.447	0.816	1.074	3.551
SCU-30	400	1	2.129	1.757	1.129	1.689	6.704
SCU-30	400	2	1.391	1.340	1.482	2.113	6.326
LSD .05	(Check + 50)		.188	.119	.072	.126	.253
LSD .05	(100, 200, 400)		.266	.309	.313	.393	.710

*1 Fertilizer was applied as a single application.

**2 Fertilizer was applied as split applications.

TABLE XX

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT
OF NITROGEN SOURCES APPLIED AT THE 50 LB N/ACRE RATE
AND 0 LB N/ACRE, EXP. I (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.033076	1.98	14.23
TRT	8	0.305620	18.33	0.01
ERROR	24	0.016669	-----	-----
TOTAL	35	0.084122	-----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.009754	1.46	24.97
TRT	8	0.012855	1.92	10.27
ERROR	24	0.006682	-----	-----
TOTAL	35	0.008356	-----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	3	0.006466	2.68	6.89
TRT	8	0.012314	5.10	0.11
ERROR	24	0.002415	-----	-----
TOTAL	35	0.005025	-----	-----

Har. 4

SOURCE	df	MS	F	OSL%
REP	3	0.005139	0.69	56.69
TRT	8	0.013725	1.86	11.49
ERROR	24	0.007391	-----	-----
TOTAL	35	0.008645	-----	-----

TABLE XX (Continued)

Total

SOURCE	df	MS	F	OSL%
REP	3	0.042270	1.41	26.44
TRT	8	0.348268	11.59	0.01
ERROR	24	0.030042	-----	-----
TOTAL	35	0.103828	-----	-----

TABLE XXI

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT OF NITROGEN
SOURCES, RATES AND METHOD OF APPLICATION, EXP. I (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.203939	5.54	0.16
SOURCE	7	7.076425	192.08	0.01
RATE	2	0.379515	10.30	0.02
SOURCE * RATE	14	0.245311	6.66	0.01
METHOD	1	4.538392	123.19	0.01
SOURCE * METHOD	7	1.189438	32.28	0.01
RATE * METHOD	2	0.143830	3.90	2.18
SOURCE * RATE * METHOD	14	0.099625	2.70	0.18
ERROR	141	0.036841	-----	-----
TOTAL	191	0.387861	-----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.058361	1.17	32.27
SOURCE	7	1.298083	26.05	0.01
RATE	2	7.875313	158.06	0.01
SOURCE * RATE	14	0.931155	18.68	0.01
METHOD	1	0.759279	15.23	0.03
SOURCE * METHOD	7	1.128503	22.64	0.01
RATE * METHOD	2	0.081132	1.63	19.81
SOURCE * RATE * METHOD	14	0.197983	3.97	0.01
ERROR	141	0.049825	-----	-----
TOTAL	191	0.296684	-----	-----

TABLE XXI (Continued)

Har. 3

SOURCE	df	MS	F	OSL%
REP	3	0.034261	0.67	57.54
SOURCE	7	0.132882	2.60	1.49
RATE	2	7.111731	139.09	0.01
SOURCE * RATE	14	0.173519	3.39	0.02
METHOD	1	0.526788	10.30	0.02
SOURCE * METHOD	7	0.720771	14.10	0.01
RATE * METHOD	2	0.034094	0.66	51.96
SOURCE * RATE * METHOD	14	0.041242	0.81	66.18
ERROR	141	0.051131	-----	-----
TOTAL	191	0.162895	-----	-----

Har. 4

SOURCE	df	MS	F	OSL%
REP	3	0.159206	1.99	11.75
SOURCE	7	0.202052	2.52	1.79
RATE	2	16.724705	208.53	0.01
SOURCE * RATE	14	0.286936	3.58	0.01
METHOD	1	0.166322	2.07	14.83
SOURCE * METHOD	7	0.913839	11.39	0.01
RATE * METHOD	2	0.606535	7.56	0.11
SOURCE * RATE * METHOD	14	0.123058	1.53	10.60
ERROR	141	0.080204	-----	-----
TOTAL	191	0.315007	-----	-----

Total

SOURCE	df	MS	F	OSL%
REP	3	1.081544	4.12	0.80
SOURCE	7	12.724548	48.44	0.01
RATE	2	102.611796	390.62	0.01
SOURCE * RATE	14	2.765421	14.33	0.01
METHOD	1	3.489756	13.28	0.07
SOURCE * METHOD	7	7.585992	28.88	0.01
RATE * METHOD	2	1.570944	5.98	0.36
SOURCE * RATE * METHOD	14	0.556897	2.12	1.40
ERROR	141	0.262687	-----	-----
TOTAL	191	2.381282	-----	-----

TABLE XXII

PERCENT NITROGEN IN BERMUDAGRASS FORAGE AS AFFECTED BY NITROGEN
SOURCES, RATES AND METHOD OF APPLICATION, EXP. I (1971)

SOURCE	RATE	METHOD	% N in Forage			
			HAR. 1	HAR. 2	HAR. 3	HAR. 4
Check	0	0	1.15	1.16	1.26	0.95
B	50	1*	1.16	1.33	1.38	0.93
B+U	50	1	1.28	1.38	1.23	0.98
B+S	50	1	1.44	1.37	1.13	0.95
AN	50	1	1.19	1.36	1.32	1.18
U	50	1	1.09	1.36	1.26	1.10
SCU-10	50	1	1.00	1.31	1.32	1.08
SCU-20	50	1	1.05	1.34	1.31	1.08
SCU-30	50	1	1.00	1.34	1.30	1.00
B	100	1	2.36	1.56	1.56	1.08
B	100	2**	2.18	1.33	1.31	1.00
B	200	1	1.62	2.12	1.78	1.00
B	200	2	1.64	1.41	1.39	1.08
B	400	1	1.03	0.85	2.03	1.20
B	400	2	1.49	1.94	1.76	1.23
B+U	100	1	1.16	1.43	1.39	0.90
B+U	100	2	1.76	1.39	1.43	0.98
B+U	200	1	1.20	1.55	1.23	0.95
B+U	200	2	1.96	2.05	1.65	1.13
B+U	400	1	2.60	1.64	1.49	1.18
B+U	400	2	2.17	2.30	2.06	1.40
B+S	100	1	1.89	1.32	1.41	1.15
B+S	100	2	1.30	1.90	1.44	1.08
B+S	200	1	2.20	1.54	1.66	1.08
B+S	200	2	1.28	2.04	1.60	0.98
B+S	400	1	1.27	2.41	1.93	1.08
B+S	400	2	1.73	2.28	1.97	1.30
AN	100	1	1.42	1.26	1.30	0.98
AN	100	2	1.67	1.38	1.21	0.95
AN	200	1	2.67	1.84	1.99	1.33
AN	200	2	1.81	2.16	1.49	1.15
AN	400	1	2.84	1.92	2.28	1.58
AN	400	2	2.22	2.43	2.38	1.30
U	100	1	1.15	1.44	1.26	1.10
U	100	2	1.61	2.09	1.38	0.95
U	200	1	1.47	1.29	1.22	0.93
U	200	2	2.34	2.28	1.40	1.13
U	400	1	2.18	1.11	1.32	1.08
U	400	2	2.91	2.08	2.34	1.05
SCU-10	100	1	1.28	1.30	1.39	1.03
SCU-10	100	2	1.60	1.10	1.38	1.00
SCU-10	200	1	1.24	1.30	1.55	1.30
SCU-10	200	2	1.60	1.37	1.22	0.98
SCU-10	400	1	1.62	1.64	1.95	1.23

TABLE XXII (Continued)

SOURCE	RATE	METHOD	% N in Forage			
			HAR. 1	HAR. 2	HAR. 3	HAR. 4
SCU-10	400	2	1.59	1.74	1.95	1.40
SCU-20	100	1	1.63	1.14	1.34	1.20
SCU-20	100	2	1.17	1.18	1.41	0.98
SCU-20	200	1	1.30	1.39	1.54	1.40
SCU-20	200	2	1.15	1.56	1.40	1.23
SCU-20	400	1	1.83	1.27	1.82	1.25
SCU-20	400	2	1.78	1.66	1.81	1.40
SCU-30	100	1	0.98	1.40	1.31	1.20
SCU-30	100	2	1.36	1.57	1.41	0.98
SCU-30	200	1	1.46	1.40	1.42	1.25
SCU-30	200	2	1.40	1.79	1.51	1.18
SCU-3-	400	1	1.96	1.75	2.01	1.45
SCU-30	400	2	2.10	1.97	1.93	1.35
LSD .05 (Check + 50)			.25	.23	.25	.16
LSD .05 (100, 200, 400)			.59	.49	.29	.17

*1 Fertilizer was applied as a single application.

**2 Fertilizer was applied as split applications.

TABLE XXIII

ANALYSIS OF VARIANCE ON PERCENT NITROGEN IN BERMUDAGRASS FORAGE FOR
THE EFFECT OF NITROGEN SOURCES AT 50 LB N/ACRE, EXP. I (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.055085	1.85	16.42
TRT	8	0.078794	2.65	3.08
ERROR	24	0.029779	----	-----
TOTAL	35	0.043151	----	----

TABLE XXIII (Continued)

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.061566	2.48	8.46
TRT	8	0.017547	0.71	68.43
ERROR	24	0.024834	----	-----
TOTAL	35	0.026317	----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	3	0.004477	0.16	92.28
TRT	8	0.019644	0.69	69.40
ERROR	24	0.028285	----	-----
TOTAL	35	0.024269	----	-----

Har. 4

SOURCE	df	MS	F	OSL%
REP	3	0.001759	0.16	92.48
TRT	8	0.028750	2.53	3.69
ERROR	24	0.011343	----	-----
TOTAL	35	0.014500	----	-----

TABLE XXI^V

ANALYSIS OF VARIANCE ON PERCENT NITROGEN IN BERMUDAGRASS
FORAGE FOR THE EFFECT OF NITROGEN SOURCES, RATES AND
METHOD OF APPLICATION, EXP. I (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.129081	0.72	54.50
SOURCE	7	1.217239	6.79	0.01
RATE	2	3.182979	17.75	0.01
SOURCE * RATE	14	1.187099	6.62	0.01
METHOD	1	0.206719	1.15	28.46
SOURCE * METHOD	7	0.812994	4.53	0.03
RATE * METHOD	2	0.045567	0.25	77.94
SOURCE * RATE * METHOD	14	0.043526	2.47	0.40
ERROR	141	0.179351	-----	-----
TOTAL	191	0.363246	-----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.269553	2.18	9.13
SOURCE	7	0.906601	7.34	0.01
RATE	2	2.520313	20.42	0.01
SOURCE * RATE	14	0.350546	2.84	0.11
METHOD	1	4.296033	34.80	0.01
SOURCE * METHOD	7	0.430418	3.49	0.21
RATE * METHOD	2	0.468407	3.79	2.41
SOURCE * RATE * METHOD	14	0.308057	2.50	0.37
ERROR	141	0.123446	-----	-----
TOTAL	191	0.246427	-----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	3	0.019239	0.44	72.71
SOURCE	7	0.192285	4.42	0.03
RATE	2	5.692135	130.84	0.01
SOURCE * RATE	14	0.118584	2.73	0.17
METHOD	1	0.034938	0.80	62.49
SOURCE * METHOD	7	0.378888	8.71	0.01
RATE * METHOD	2	0.275644	6.34	0.27
SOURCE * RATE * METHOD	14	0.099717	2.29	0.75
ERROR	141	0.043504	-----	-----
TOTAL	191	0.132025	-----	-----

TABLE XXIV (Continued)

Har. 4

SOURCE	df	MS	F	OSL%
REP	3	0.034219	2.18	9.13
SOURCE	7	0.138504	8.84	0.01
RATE	2	0.978802	62.45	0.01
SOURCE * RATE	14	0.056719	3.62	0.01
METHOD	1	0.043802	2.79	9.28
SOURCE * METHOD	7	0.061183	3.90	0.09
RATE * METHOD	2	0.083802	5.35	0.61
SOURCE * RATE * METHOD	14	0.046004	2.94	0.08
ERROR	141	0.015673	-----	-----
TOTAL	191	0.038311	-----	-----

TABLE XXV

POUNDS OF NITROGEN PRODUCED FROM BERMUDAGRASS FORAGE AS AFFECTED BY
NITROGEN SOURCES, RATES AND METHOD OF APPLICATION, EXP. I (1971)

			lb N/Acre from Forage				
SOURCE	RATE	METHOD	HAR. 1	HAR. 2	HAR. 3	HAR. 4	TOTAL
Check	0	0	12.623	6.962	4.277	6.828	30.690
B	50	1	16.786	6.510	6.920	6.312	36.528
B+U	50	1	19.644	4.539	5.202	8.139	37.524
B+S	50	1	18.900	9.488	8.184	8.207	44.779
AN	50	1	32.405	6.416	5.351	10.045	54.217
U	50	1	28.184	5.934	5.539	11.273	50.929
SCU-10	50	1	16.103	6.021	6.327	10.499	38.950
SCU-20	50	1	18.414	5.839	6.953	10.419	41.625
SCU-30	50	1	19.374	5.235	7.225	9.490	41.324
B	100	1	12.511	42.161	25.140	21.392	100.204
B	100	2	28.710	13.479	8.316	6.670	57.176
B	200	1	9.633	40.412	39.483	26.608	118.135
B	200	2	17.949	14.868	15.018	17.833	65.668
B	400	1	4.988	5.105	37.791	32.654	80.538
B	400	2	13.800	16.275	27.533	32.583	90.191
B+U	100	1	18.522	5.576	6.272	6.566	36.936
B+U	100	2	26.900	14.480	16.104	14.610	72.094
B+U	200	1	23.955	12.701	8.278	9.603	53.537
B+U	200	2	23.646	38.574	34.983	24.256	121.277
B+U	400	1	21.380	38.453	30.237	30.209	120.279
B+U	400	2	36.546	68.405	56.403	57.678	219.041

TABLE XXV (Continued)

SOURCE	RATE	METHOD	lb N/Acre from Forage				TOTAL
			HAR. 1	HAR. 2	HAR. 3	HAR. 4	
B+S	100	1	17.273	14.184	13.644	13.497	58.598
B+S	100	2	16.050	8.805	12.268	17.286	54.409
B+S	200	1	12.628	32.855	22.935	27.772	96.190
B+S	200	2	12.763	8.593	20.936	19.354	61.645
B+S	400	1	2.781	38.104	50.201	35.078	126.164
B+S	400	2	14.140	15.212	41.602	36.643	107.597
AN	100	1	55.406	8.268	8.821	9.085	81.280
AN	100	2	43.615	14.150	10.423	11.896	80.084
AN	200	1	102.638	63.826	30.034	33.106	229.604
AN	200	2	55.146	56.845	30.439	20.213	162.642
AN	400	1	100.252	72.533	45.009	55.365	273.159
AN	400	2	77.981	92.763	61.570	41.925	274.239
U	100	1	40.349	7.663	7.968	13.739	69.717
U	100	2	43.700	31.747	26.713	18.454	120.614
U	200	1	64.269	7.044	7.055	8.972	87.340
U	200	2	66.482	43.491	27.087	20.409	157.469
U	400	1	88.075	17.608	14.402	13.327	133.412
U	400	2	89.152	73.083	52.570	39.370	254.375
SCU-10	100	1	30.066	9.490	10.477	14.986	65.019
SCU-10	100	2	21.778	6.998	7.737	10.494	47.007
SCU-10	200	1	35.848	15.197	18.597	29.160	98.802
SCU-10	200	2	20.313	8.780	7.996	10.604	47.693
SCU-10	400	1	60.292	43.173	47.206	44.013	194.684
SCU-10	400	2	25.640	22.802	41.753	50.975	141.171
SCU-20	100	1	39.758	5.520	8.912	14.603	68.793
SCU-20	100	2	17.185	5.661	8.263	12.021	43.130
SCU-20	200	1	43.015	19.196	17.698	29.593	109.517
SCU-20	200	2	19.015	11.746	11.677	23.079	65.517
SCU-20	400	1	71.267	35.542	33.459	46.749	187.017
SCU-20	400	2	41.518	17.391	40.146	54.990	154.045
SCU-30	100	1	28.909	11.216	8.931	14.305	63.361
SCU-30	100	2	25.737	8.990	11.722	11.00	57.449
SCU-30	200	1	54.821	24.737	20.540	27.027	127.125
SCU-30	200	2	34.068	16.197	24.759	24.877	99.901
SCU-30	400	1	83.513	61.440	45.503	49.374	239.830
SCU-30	400	2	57.876	52.907	56.413	56.199	223.395
LSD .05	(Check + 50)		4.834	2.984	2.388	3.811	8.195
LSD .05	(100, 200, 400)		14.233	12.295	12.528	10.611	27.529

TABLE XXVI

ANALYSIS OF VARIANCE ON THE POUNDS OF NITROGEN PRODUCED
FROM BERMUDAGRASS FORAGE FOR THE EFFECT OF NITROGEN
SOURCES APPLIED AT 50 LB N/ACRE, EXP. I (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	30.902209	2.82	5.97
TRT	8	152.188248	13.87	0.01
ERROR	24	10.969411	-----	-----
TOTAL	35	44.956528	-----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	11.978480	2.86	5.69
TRT	8	7.657309	1.83	12.00
ERROR	24	4.181024	-----	-----
TOTAL	35	5.643957	-----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	3	4.809881	1.80	17.38
TRT	8	5.968625	2.23	6.13
ERROR	24	2.677197	-----	-----
TOTAL	35	3.612325	-----	-----

Har. 4

SOURCE	df	MS	F	OSL%
REP	3	2.587111	0.38	77.13
TRT	8	12.034176	1.77	13.42
ERROR	24	6.816776	-----	-----
TOTAL	35	7.646782	-----	-----

TABLE XXVI (Continued)

Total

SOURCE	df		F	OSL%
REP	3	82.967007	2.63	7.22
TRT	8	212.132551	6.73	0.02
ERROR	24	31.525348	-----	-----
TOTAL	35	77.216280	-----	-----

TABLE XXVII

ANALYSIS OF VARIANCE ON POUNDS OF NITROGEN PRODUCED FROM BERMUDAGRASS
FORAGE FOR THE EFFECT OF NITROGEN SOURCES, RATES
AND METHODS OF APPLICATION, EXP. I (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	224.3442	2.13	9.81
SOURCE	7	11712.6623	111.06	0.01
RATE	2	6594.2336	62.52	0.01
SOURCE * RATE	14	1146.1120	10.87	0.01
METHOD	1	3091.7420	29.32	0.01
SOURCE * METHOD	7	1476.7373	14.00	0.01
RATE * METHOD	2	410.6593	3.89	2.20
SOURCE * RATE * METHOD	14	171.7413	1.63	7.81
ERROR	141	105.4660	-----	-----
TOTAL	191	750.8954	-----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	102.9685	1.31	27.32
SOURCE	7	3107.3724	39.49	0.01
RATE	2	13414.0300	170.45	0.01
SOURCE * RATE	14	1574.9572	20.01	0.01
METHOD	1	76.1912	0.97	67.21
SOURCE * METHOD	7	2322.9199	29.52	0.01
RATE * METHOD	2	272.2433	3.46	3.31
SOURCE * RATE * METHOD	14	346.1895	4.40	0.01
ERROR	141	78.6958	-----	-----
TOTAL	191	543.2558	-----	-----

TABLE XXVII (Continued)

Total

SOURCE	df	MS	F	OSL%
REP	3	1550.848	3.93	1.00
SOURCE	7	27002.429	68.44	0.01
RATE	2	194718.585	493.52	0.01
SOURCE * RATE	14	7986.618	20.24	0.01
METHOD	1	156.924	0.40	53.65
SOURCE * METHOD	7	13518.081	34.26	0.01
RATE * METHOD	2	3856.587	9.77	0.03
SOURCE * RATE * METHOD	14	1098.576	2.78	0.14
ERROR	141	394.550	-----	-----
TOTAL	191	4546.742	-----	-----

TABLE XXVIII

PERCENT OF TOTAL NITROGEN PRODUCED BY HARVEST AND PERCENT RECOVERY OF
APPLIED NITROGEN AS AFFECTED BY NITROGEN SOURCES, RATES AND
METHOD OF APPLICATION, EXP. I (1971)

% of Total N Produced								
SOURCE	RATE	APPLIED	%HAR. 1	%HAR. 2	%HAR. 3	%HAR. 4	%REC	TOTAL LB
Check	0	0	41.14	22.68	13.94	22.24	--	30.690
B	50	1*	45.95	17.82	18.94	17.28	12	36.528
B+U	50	1	52.35	12.10	13.85	21.69	14	37.524
B+S	50	1	42.21	21.19	18.28	18.33	28	44.779
AN	50	1	59.77	11.83	9.87	18.53	47	54.213
U	50	1	55.34	11.65	10.88	22.13	41	50.929
SCU-10	50	1	41.34	15.46	16.24	26.95	17	38.950
SCU-20	50	1	44.24	14.03	16.70	25.03	22	41.625
SCU-30	50	1	46.88	12.67	17.48	22.96	21	41.324
B	100	1	12.49	42.08	25.09	21.35	70	100.204
B	100	2**	50.21	23.57	14.54	11.67	27	57.176
B	200	1	8.15	34.21	33.43	22.52	44	118.135
B	200	2	27.33	22.64	22.89	27.16	17	65.668
B	400	1	6.19	6.34	47.07	40.54	12	80.538
B	400	2	15.30	18.05	30.53	36.13	15	90.191
B+U	100	1	50.15	15.10	16.98	17.78	6	36.936
B+U	100	2	37.31	20.08	22.34	20.27	41	72.094
B+U	200	1	44.74	23.72	15.46	17.94	11	53.537
B+U	200	2	29.35	31.81	28.85	20.00	45	121.277
B+U	400	1	17.78	31.97	25.14	25.12	22	120.279

XXVIII (Continued)

% of Total N Produced								
SOURCE	RATE	APPLIED	%HAR. 1	%HAR. 2	%HAR. 3	%HAR. 4	%REC	TOTAL LB
B+U	400	2	16.68	31.23	25.75	26.34	47	219.041
B+S	100	1	29.48	24.21	23.28	23.03	28	58.598
B+S	100	2	29.50	16.18	22.55	31.77	24	54.409
B+S	200	1	13.13	34.16	23.84	28.87	33	96.190
B+S	200	2	20.70	13.92	33.96	31.40	16	61.645
B+S	400	1	2.20	30.20	39.79	27.80	24	126.164
B+S	400	2	13.14	14.14	38.66	34.06	19	107.597
AN	100	1	68.17	10.17	10.48	11.18	51	81.280
AN	100	2	54.46	17.67	13.02	14.85	49	80.084
AN	200	1	44.70	27.80	13.08	14.42	99	229.604
AN	200	2	33.91	34.95	18.72	12.43	66	162.642
AN	400	1	36.70	26.55	16.48	20.27	61	273.159
AN	400	2	28.44	33.83	22.45	15.29	61	274.239
U	100	1	57.87	10.99	11.43	19.71	39	69.717
U	100	2	36.23	26.32	22.15	15.30	90	120.614
U	200	1	73.58	8.07	8.08	10.27	28	87.340
U	200	2	42.22	27.62	17.20	12.96	63	157.469
U	400	1	66.02	13.20	10.80	9.99	25	133.412
U	400	2	35.05	28.73	20.67	15.48	56	254.375
SCU-10	100	1	46.24	14.60	16.11	23.05	34	65.019
SCU-10	100	2	46.33	14.89	16.46	22.32	16	47.007
SCU-10	200	1	36.28	15.38	18.82	29.51	34	98.802
SCU-10	200	2	42.59	18.41	16.77	22.23	9	47.693
SCU-10	400	1	30.97	22.18	24.25	22.61	41	194.684
SCU-10	400	2	18.16	16.15	29.58	36.11	28	141.171
SCU-20	100	1	57.79	8.02	12.96	21.23	38	68.793
SCU-20	100	2	39.84	13.13	19.16	27.87	12	43.130
SCU-20	200	1	39.28	17.53	16.16	27.03	39	109.502
SCU-20	200	2	29.02	17.93	17.82	35.23	17	65.517
SCU-20	400	1	38.11	19.-0	17.89	25.00	39	187.017
SCU-20	400	2	26.95	11.29	26.06	35.70	31	154.045
SCU-30	100	1	46.63	17.69	14.10	22.58	33	63.361
SCU-30	100	2	44.80	15.65	20.40	19.15	27	57.449
SCU-30	200	1	43.12	19.46	16.16	21.26	48	127.125
SCU-30	200	2	34.10	16.21	24.78	24.90	35	99.901
SCU-30	400	1	34.83	25.62	18.97	20.59	52	239.830
SCU-30	400	2	25.91	23.68	25.25	25.16	48	223.395

*1 Fertilizer was applied as a single application.

**2 Fertilizer was applied as split applications.

TABLE XXIX

BERMUDAGRASS YIELDS AS AFFECTED BY NITROGEN SOURCES, RATES
AND METHOD OF APPLICATION, EXP. I (1972)

SOURCE	RATE	APPLIED	Yield		TOTAL
			HAR. 1	HAR. 2	
			Ton/Acre (dry weight)		
Check	0	0	0.499	0.229	0.728
B	50	1R*	0.453	0.266	0.719
B+U	50	1R	0.418	0.209	0.627
B+S	50	1R	0.395	0.241	0.636
AN	ro	1	1.218	0.218	1.436
U	50	1	1.220	0.308	1.528
SCU-10	50	1	0.887	0.410	1.297
SCU-20	50	1	0.901	0.510	1.411
SCU-30	50	1	0.944	0.333	1.277
B	100	1R	0.572	0.281	0.853
B	100	2R**	0.733	0.185	0.918
B	200	1R	0.658	0.217	0.875
B	200	2R	0.597	0.253	0.850
B	400	1R	1.033	0.349	1.382
B	400	2R	0.750	0.240	0.990
B+U	100	1R	0.357	0.281	0.638
B+U	100	2R	0.643	0.288	0.931
B+U	200	1R	0.469	0.243	0.712
B+U	200	2R	0.579	0.345	0.924
B+U	400	1R	0.677	0.221	0.898
B+U	400	2R	0.787	0.252	1.039
B+S	100	1R	0.487	0.287	0.774
B+S	100	2R	0.610	0.231	0.841
B+S	200	1R	0.558	0.210	0.768
B+S	200	2R	0.412	0.202	0.614
B+S	400	1R	0.865	0.172	1.037
B+S	400	2R	0.671	0.285	0.956
AN	100	1	1.485	0.410	1.895
AN	100	2	0.931	0.688	1.619
AN	200	1	1.616	0.682	2.298
AN	200	2	1.225	0.866	2.091
AN	400	1	1.909	1.025	2.034
AN	400	2	1.791	1.069	2.860
U	100	1	1.524	0.427	1.951
U	100	2	0.953	0.606	1.559
U	200	1	1.887	0.625	2.512
U	200	2	1.375	0.620	1.995
U	400	1	2.039	0.845	2.884
U	400	2	1.437	0.879	2.316
SCU-10	100	1	1.328	0.642	1.970
SCU-10	100	2	0.834	0.701	1.535
SCU-10	200	1	1.572	0.882	2.454
SCU-10	200	2	0.955	0.736	1.691
SCU-10	400	1	2.112	1.093	3.205

TABLE XXIX (Continued)

SOURCE	RATE	APPLIED	Yield		TOTAL
			Ton/Acre (dry weight)		
			HAR. 1	HAR. 2	
SCU-10	400	2	1.713	0.747	2.460
SCU-20	100	1	1.287	0.580	1.867
SCU-20	100	2	0.962	0.489	1.451
SCU-20	200	1	1.791	0.688	2.479
SCU-20	200	2	1.414	0.915	2.329
SCU-20	400	1	1.815	1.442	3.257
SCU-20	400	2	1.497	0.936	2.422
SCU-30	100	1	1.447	0.512	1.959
SCU-30	100	2	0.847	0.520	1.367
SCU-30	200	1	1.420	0.505	1.925
SCU-30	200	2	1.181	0.786	1.967
SCU-30	400	1	1.814	0.968	2.782
SCU-30	400	2	1.684	0.988	2.672

LSD .05 (Check + Residual) .277 .115 .294

LSD .05 (Check + 50 Applied) .205 .124 .294

LSD .05 (100, 200, 400 Applied) .291 .323 .481

*R - Residual

1 - Fertilizer applied as single application

**2 - Fertilizer applied as split applications

TABLE XXX

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE
EFFECT OF RESIDUAL BIURET SOURCES, EXP. I (1972)

Har. 1

SOURCES	df	MS	F	OSL%
REP	3	0.195914	5.11	0.35
TRT	21	0.110844	2.89	0.08
ERROR	63	0.038325	----	----
TOTAL	87	0.061264	----	----

TABLE XXX (Continued)

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.006644	1.01	39.65
TRT	21	0.009340	1.27	23.32
ERROR	63	0.006592	-----	-----
TOTAL	87	0.007016	-----	-----

Total

SOURCE	df	MS	F	OSL%
REP	3	0.184617	4.26	0.85
TRT	21	0.126215	2.91	0.08
ERROR	63	0.043345	-----	-----
TOTAL	87	0.068220	-----	-----

TABLE XXXI

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT OF
NITROGEN SOURCES APPLIED AT 50 LB N/ACRE, EXP. I (1972)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.088705	4.77	1.56
TRT	5	0.283603	15.27	0.01
ERROR	15	0.018578	-----	-----
TOTAL	23	0.085339	-----	-----

TABLE XXXI (Continued)

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.013543	2.01	15.52
TRT	5	0.049523	7.35	0.15
ERROR	15	0.006740	-----	-----
TOTAL	23	0.016928	-----	-----

Total

SOURCE	df	MS	F	OSL%
REP	3	0.160470	4.22	2.34
TRT	5	0.326658	8.59	0.08
ERROR	15	0.038023	-----	-----
TOTAL	23	0.116741	-----	-----

TABLE XXXII

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT OF NITROGEN
SOURCES, RATES AND METHOD OF APPLICATION, EXP. I (1972)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.243934	5.71	0.16
SOURCE	4	0.073451	1.72	15.21
RATE	2	3.867846	90.50	0.01
SOURCE * RATE	8	0.133381	3.12	0.41
METHOD	1	5.202937	121.74	0.01
SOURCE * METHOD	4	0.070773	1.66	16.65
RATE * METHOD	2	0.096437	2.26	10.88
SOURCE * RATE * METHOD	8	0.038027	0.89	52.93
ERROR	87	0.042738	-----	-----
TOTAL	119	0.164115	-----	-----

TABLE XXXII (Continued)

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.097387	1.85	14.34
SOURCE	4	0.121385	2.30	6.42
RATE	2	1.974531	37.42	0.01
SOURCE * RATE	8	0.051915	0.98	54.51
METHOD	1	0.005921	0.11	73.79
SOURCE * METHOD	4	0.119671	2.26	6.74
RATE * METHOD	2	0.205725	3.90	2.33
SOURCE * RATE * METHOD	8	0.060282	1.14	34.32
ERROR	87	0.052764	-----	-----
TOTAL	119	0.093369	-----	-----

Total

SOURCE	df	MS	F	OSL%
REP	3	0.609627	5.21	0.27
SOURCE	4	0.137441	1.17	32.70
RATE	2	11.353187	97.08	0.01
SOURCE * RATE	8	0.118913	1.02	43.00
METHOD	1	4.857816	41.54	0.01
SOURCE * METHOD	4	0.229266	1.96	10.67
RATE * METHOD	2	0.056173	0.48	62.60
SOURCE * RATE * METHOD	8	0.124859	1.07	39.33
ERROR	87	0.116942	-----	-----
TOTAL	119	0.362155	-----	-----

TABLE XXXIII

PERCENT NITROGEN IN BERMUDAGRASS FORAGE AS AFFECTED BY NITROGEN
SOURCES, RATES AND METHOD OF APPLICATION, EXP. I (1972)

SOURCE	RATE	METHOD	HAR. 1	HAR. 2
CHECK	0	0	1.00	1.26
B	50	1R*	0.95	1.25
B+U	50	1R	0.97	1.28
B+S	50	1R	0.82	1.09
AN	50	1	0.96	1.21

TABLE XXXIII (Continued)

SOURCE	RATE	METHOD	% N in Forage	
			HAR. 1	HAR. 2
U	50	1	0.99	1.41
SCU-10	50	1	0.89	1.42
SCU-20	50	1	1.01	1.45
SCU-30	50	1	0.88	1.34
B	100	1R	0.91	1.31
B	100	2R**	1.10	1.53
B	200	1R	1.08	1.31
B	200	2R	0.91	1.42
B	400	1R	1.02	1.59
B	400	2R	0.88	1.81
B+U	100	1R	0.99	1.48
B+U	100	2R	0.86	1.35
B+U	200	1R	0.87	1.24
B+U	200	2R	0.95	1.32
B+U	400	1R	0.83	1.27
B+U	400	2R	0.95	1.76
B+S	100	1R	0.78	1.47
B+S	100	2R	0.99	1.24
B+S	200	1R	0.84	1.15
B+A	200	2R	0.94	1.26
B+S	400	1R	0.93	1.32
B+S	400	2R	0.99	1.69
AN	100	1	1.10	1.43
AN	100	2	0.97	1.83
AN	200	1	1.99	1.57
AN	200	2	0.79	1.92
AN	400	1	2.31	2.24
AN	400	2	1.35	2.28
U	100	1	1.04	1.37
U	100	2	0.94	1.69
U	200	1	1.32	1.53
U	200	2	1.35	1.94
U	400	1	2.05	1.71
U	400	2	1.55	2.21
SCU-10	100	1	0.94	1.61
SCU-10	100	2	0.82	1.64
SCU-10	200	1	1.22	1.98
SCU-10	200	2	1.02	1.76
SCU-10	400	1	1.80	2.27
SCU-10	400	2	1.21	2.18
SCU-20	100	1	1.01	1.62
SCU-20	100	2	0.93	1.72
SCU-20	200	1	1.09	1.87
SCU-20	200	2	0.95	2.11
SCU-20	400	1	1.53	1.98
SCU-20	400	2	1.07	2.62
SCU-30	100	1	0.93	1.84

TABLE XXXIII (Continued)

SOURCE	RATE	METHOD	% N in Forage	
			HAR. 1	HAR.2
SCU-30	100	2	0.95	1.82
SCU-30	200	1	1.18	1.57
SCU-30	200	2	1.00	1.88
SCU-30	400	1	2.00	1.95
SCU-30	400	2	1.05	2.52

LSD_{.05} (Check + Residual) .27 .45

LSD_{.05} (Check + 50 Applied) .24 .17

LSD_{.05} (100, 200, 400 Applied) .37 .56

*R = Residual

1 = Fertilizer applied as single application

**2 = Fertilizer applied as split applications

TABLE XXXIV

ANALYSIS OF VARIANCE ON PERCENT NITROGEN IN BERMUDAGRASS FORAGE
FOR THE EFFECT OF RESIDUAL BIURET SOURCES, EXP. I (1972)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.025698	0.70	55.74
TRT	21	0.026821	0.73	78.36
ERROR	63	0.036594	----	-----
TOTAL	87	0.033859	----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.155398	1.51	21.78
TRT	21	0.146910	1.43	13.77
ERROR	63	0.102517	----	-----
TOTAL	87	0.115056	----	-----

TABLE XXXV

ANALYSIS OF VARIANCE ON PERCENT NITROGEN IN BERMUDAGRASS FORAGE FOR THE
EFFECT OF NITROGEN SOURCES APPLIED AT 50 LB N/ACRE, EXP. I (1972)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.026389	1.01	41.87
TRT	5	0.012917	0.49	77.82
ERROR	15	0.026226	----	-----
TOTAL	23	0.023354	----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.060238	4.51	1.88
TRT	5	0.036842	2.76	5.76
ERROR	15	0.013338	----	-----
TOTAL	23	0.024569	----	-----

TABLE XXXVI

ANALYSIS OF VARIANCE ON PERCENT NITROGEN IN BERMUDAGRASS FORAGE FOR
THE EFFECT OF NITROGEN SOURCES, RATES AND
METHOD OF APPLICATION, EXP. I (1972)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.117232	1.71	17.02
SOURCE	4	0.473354	6.89	0.02
RATE	2	4.091133	59.55	0.01
SOURCE * RATE	8	0.080650	1.17	32.36
METHOD	1	4.136653	60.21	0.01
SOURCE * METHOD	4	0.313903	4.47	0.25
RATE * METHOD	2	0.939376	13.67	0.01
SOURCE * RATE * METHOD	8	0.144800	2.11	4.30
ERROR	87	0.068702	----	-----
TOTAL	119	0.214110	----	-----

TABLE XXXVI (Continued)

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.095948	0.60	62.04
SOURCE	4	0.211955	1.33	26.56
RATE	2	3.291776	20.60	0.01
SOURCE * RATE	8	0.091949	0.51	84.43
METHOD	1	1.847601	11.56	0.14
SOURCE * METHOD	4	0.162913	1.02	40.26
RATE * METHOD	2	0.123386	0.77	53.08
SOURCE * RATE * METHOD	8	0.087280	0.55	81.93
ERROR	87	0.159775	-----	-----
TOTAL	119	0.216130	-----	-----

TABLE XXXVII

POUNDS OF NITROGEN PRODUCED FROM BERMUDAGRASS FORAGE AS AFFECTED BY
NITROGEN SOURCES, RATES AND METHOD OF APPLICATION, EXP. I (1972)

Lb N/Acre from Forage					
SOURCE	RATE	METHOD	HAR. 1	HAR. 2	TOTAL
CHECK	0	0	10.411	5.884	16.295
B	50	1R*	8.583	6.693	15.276
B+U	50	1R	8.084	5.211	13.295
B+S	50	1R	6.072	5.177	11.249
AN	50	1	22.530	5.321	28.851
U	50	1	24.073	8.587	32.660
SCU-10	50	1	15.769	11.695	27.464
SCU-20	50	1	18.219	14.948	33.167
SCU-30	50	1	16.651	9.065	25.716
B	100	1R	10.681	7.333	18.014
B	100	2R	16.379	5.159	21.898
B	200	1R	13.947	5.602	19.549
B	200	2R	11.200	7.105	18.305
B	400	1R	23.226	9.505	32.732
B	400	2R	13.327	8.398	21.725
B+U	100	1R	6.222	8.308	14.530
B+U	100	2R	10.826	7.756	18.582
B+U	200	1R	8.176	6.096	14.272
B+U	200	2R	10.901	9.334	20.235
B+U	400	1R	11.593	5.572	17.165
B+U	400	2R	14.992	8.251	23.243

TABLE XXXVII (Continued)

SOURCE	RATE	METHOD	Lb N/Acre from Forage		TOTAL
			HAR. 1	HAR. 2	
B+U	100	1R	6.222	8.308	14.530
B+U	100	2R	10.826	7.756	18.582
B+U	200	1R	8.176	6.096	14.272
B+U	200	2R	10.901	9.334	20.235
B+U	400	1R	11.593	5.572	17.165
B+U	400	2R	14.992	8.251	23.243
B+S	100	1R	7.628	8.641	16.269
B+S	100	2R	13.384	5.713	19.097
B+S	200	1R	9.397	4.952	14.349
B+S	200	2R	7.820	4.790	12.610
B+S	400	1R	16.075	4.600	20.675
B+S	400	2R	12.958	9.057	22.015
AN	100	1	32.726	11.854	44.580
AN	100	2	18.034	25.213	43.247
AN	200	1	64.472	21.362	85.834
AN	200	2	19.667	32.348	52.015
AN	400	1	88.534	45.295	133.829
AN	400	2	49.006	47.483	96.489
U	100	1	31.257	11.802	43.059
U	100	2	17.767	20.235	38.002
U	200	1	49.513	18.649	68.162
U	200	2	35.508	24.670	60.178
U	400	1	83.349	30.861	114.210
U	400	2	45.074	35.883	80.957
SCU-10	100	1	25.637	20.672	46.309
SCU-10	100	2	13.866	22.318	36.184
SCU-10	200	1	38.226	34.700	72.926
SCU-10	200	2	19.923	25.486	45.409
SCU-10	400	1	76.750	49.436	126.186
SCU-10	400	2	41.624	35.980	77.604
SCU-20	100	1	25.584	19.121	44.705
SCU-20	100	2	17.921	16.851	34.773
SCU-20	200	1	39.201	25.469	64.670
SCU-20	200	2	26.842	39.802	66.644
SCU-20	400	1	56.925	54.072	110.997
SCU-20	400	2	32.033	49.467	81.500
SCU-30	100	1	26.963	19.276	46.239
SCU-30	100	2	16.226	19.262	35.518
SCU-30	200	1	33.428	15.908	49.336
SCU-30	200	2	23.616	27.942	51.558
SCU-30	400	1	72.554	38.460	111.014
SCU-30	400	2	35.382	44.878	80.260
LSD .05 (Check + Residual)			7.969	2.958	9.009
LSD .05 (Check + 50 Applied)			6.404	4.205	9.781

TABLE XXXVII (Continued)

LSD_{.05} (100, 200, 400 Applied) 14.748 13.565 20.814

*R = Residual

1 = Fertilizer was applied as a single application

**2 = Fertilizer was applied as split applications

TABLE XXXVIII

ANALYSIS OF VARIANCE ON POUNDS OF NITROGEN PRODUCED FROM
BERMUDAGRASS FORAGE FOR THE EFFECT OF RESIDUAL
BIURET SOURCES, EXP. I (1972)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	120.654052	3.79	1.43
TRT	21	63.551292	1.99	1.81
ERROR	63	31.786149	----	-----
TOTAL	87	42.518008	----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	4.721625	1.08	36.53
TRT	21	10.477232	2.39	0.43
ERROR	63	4.377906	----	-----
TOTAL	87	5.862009	----	-----

Total

SOURCE	df	MS	F	OSL%
REP	3	153.806278	3.78	1.45
TRT	21	85.592902	2.13	1.11
ERROR	63	40.625954	----	-----
TOTAL	87	55.624194	----	-----

TABLE XXXIX

ANALYSIS OF VARIANCE ON POUNDS OF NITROGEN PRODUCED FROM BERMUDAGRASS
 FORAGE FOR THE EFFECT OF NITROGEN SOURCES APPLIED AT
 50 LB N/ACRE, EXP. I (1972)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	59.239791	3.28	4.97
TRT	5	105.455122	5.84	0.38
ERROR	15	18.060017	----	-----
TOTAL	23	42.430228	----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	17.015828	2.19	13.15
TRT	5	52.547130	6.78	0.21
ERROR	15	7.785425	----	-----
TOTAL	23	18.720196	----	-----

Total

SOURCE	df	MS	F	OSL%
REP	3	131.034993	3.11	5.74
TRT	5	151.344149	3.60	2.45
ERROR	15	42.135694	----	-----
TOTAL	23	77.472223	----	-----

TABLE XL

ANALYSIS OF VARIANCE ON POUNDS OF NITROGEN PRODUCED FROM
BERMUDAGRASS FORAGE FOR THE EFFECT OF NITROGEN SOURCES,
RATES AND METHOD OF APPLICATION, EXP. I (1972)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	351.1603	3.19	2.72
SOURCE	4	750.9719	6.82	0.02
RATE	2	12995.7951	117.95	0.01
SOURCE * RATE	8	188.0515	1.71	10.77
METHOD	1	14749.8449	133.87	0.01
SOURCE * METHOD	4	267.2720	2.43	5.32
RATE * METHOD	2	1401.4350	12.72	0.01
SOURCE * RATE * METHOD	8	112.3000	1.02	42.82
ERROR	87	110.1779	-----	-----
TOTAL	119	509.7399	-----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	102.51136	1.10	35.40
SOURCE	4	382.39036	4.11	0.46
RATE	2	6257.91275	67.14	0.01
SOURCE * RATE	8	102.39587	1.10	37.20
METHOD	1	345.18476	3.70	5.44
SOURCE * METHOD	4	233.84822	2.51	4.69
RATE * METHOD	2	154.21741	1.65	19.54
SOURCE * RATE * METHOD	8	82.12320	0.88	53.65
ERROR	87	93.21171	-----	-----
TOTAL	119	214.51685	-----	-----

Total

SOURCE	df	MS	F	OSL%
REP	3	798.4694	3.64	1.57
SOURCE	4	584.7965	2.66	3.71
RATE	2	37282.9316	169.89	0.01
SOURCE * RATE	8	188.4531	0.86	55.51
METHOD	1	10582.1939	48.22	0.01
SOURCE * METHOD	4	317.2325	1.45	22.48
RATE * METHOD	2	2272.2265	10.35	0.02
SOURCE * RATE * METHOD	8	198.8285	0.91	51.60
ERROR	87	219.4580	-----	-----
TOTAL	119	990.6424	-----	-----

TABLE XLI

BERMUDAGRASS YIELDS AS AFFECTED BY NITROGEN SOURCES, RATES
AND METHOD OF APPLICATION, EXP. I (1973)

SOURCE	RATE	METHOD	Ton/Acre (dry weight)		TOTAL
			HAR. 1	HAR. 2	
CHECK	0	0	0.944	0.878	1.822
B	50	1R*	1.046	0.878	1.924
B+U	50	1R	0.994	0.787	1.781
B+S	50	1R	0.756	0.741	1.497
AN	50	1	2.408	0.591	2.999
U	50	1	1.045	0.783	1.828
SCU-10	50	1	1.416	1.019	2.435
SCU-20	50	1	1.495	1.010	2.505
SCU-30	50	1	1.197	0.830	2.027
B	100	1R	0.739	0.611	1.350
B	100	2R	0.935	0.590	1.525
B	200	1R	0.807	0.677	1.484
B	200	2R	0.851	0.732	1.583
B	400	1R	0.792	0.715	1.507
B	400	2R	0.903	0.619	1.522
B+U	100	1R	0.853	0.726	1.579
B+U	100	2R	0.747	0.714	1.461
B+U	200	1R	0.788	0.663	1.451
B+U	200	2R	0.945	0.749	1.694
B+U	400	1R	0.776	0.626	1.402
B+U	400	2R	0.819	0.638	1.457
B+S	100	1R	0.960	0.662	1.622
B+S	100	2R	0.793	0.603	1.396
B+S	200	1R	0.824	0.736	1.560
B+S	200	2R	0.721	0.641	1.362
B+S	400	1R	0.760	0.506	1.266
B+S	400	2R	1.126	0.893	2.019
AN	100	1	2.164	0.931	3.095
AN	100	2	1.392	1.049	2.441
AN	200	1	2.024	1.008	3.032
AN	200	2	1.858	1.930	3.788
AN	400	1	2.604	1.540	4.144
AN	400	2	1.753	2.204	3.957
U	100	1	1.998	1.141	3.139
U	100	2	1.278	1.233	2.511
U	200	1	2.314	1.041	3.355
U	200	2	1.661	1.174	2.835
U	400	1	2.010	1.087	3.097
U	400	2	1.885	1.417	3.302
SCU-10	100	1	1.820	1.500	3.320
SCU-10	100	2	2.710	1.210	3.920
SCU-10	200	1	1.751	1.623	3.374
SCU-10	200	2	1.896	1.376	2.372
SCU-10	400	1	2.253	1.688	3.941

TABLE XLI (Continued)

SOURCE	RATE	METHOD	Ton/Acre (dry weight)		
			HAR. 1	HAR. 2	TOTAL
SCU-10	400	2	2.240	2.189	4.429
SCU-20	100	1	2.155	1.274	3.429
SCU-20	100	2	1.502	0.995	2.497
SCU-20	200	1	2.021	1.567	3.588
SCU-20	200	2	1.848	1.420	3.268
SCU-20	400	1	2.178	2.026	4.204
SCU-20	400	2	1.965	2.047	4.012
SCU-30	100	1	1.846	0.940	2.786
SCU-30	100	2	1.514	0.836	2.350
SCU-30	200	1	2.214	1.229	3.443
SCU-30	200	2	1.872	1.218	3.090
SCU-30	400	1	2.199	1.279	3.478
SCU-30	400	2	1.760	1.681	3.441
LSD .05 (Check + Residual)			.369	.284	.580
LSD .05 (Check + 50 Applied)			.266	.183	.343
LSD .05 (100, 200, 400 Applied)			.709	.579	.881

*R = Residual

1 = Fertilizer applied as a single application

**2 = Fertilizer applied as split applications

TABLE XLII

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT
OF RESIDUAL BIURET SOURCES, EXP. I (1973)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.126948	1.86	14.39
TRT	21	0.047616	0.70	81.92
ERROR	63	0.068207	----	-----
TOTAL	87	0.065259	----	-----

TABLE XLII

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.186750	4.63	0.58
TRT	21	0.039111	0.97	51.13
ERROR	63	0.040368	----	-----
TOTAL	87	0.045112	----	-----

Total

SOURCE	df	MS	F	OSL%
REP	3	0.314228	1.87	14.27
TRT	21	0.143240	0.85	64.94
ERROR	63	0.168219	----	-----
TOTAL	87	0.167225	----	-----

TABLE XLIII

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT OF
NITROGEN SOURCES APPLIED AT 50 LB N/ACRE, EXP. I (1973)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.024793	0.83	50.34
TRT	4	1.129913	37.94	0.01
ERROR	12	0.029781	----	-----
TOTAL	19	0.260598	----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.030296	2.15	14.69
TRT	4	0.126411	8.96	0.17
ERROR	12	0.014108	----	-----
TOTAL	19	0.040307	----	-----

TABLE XLIII (Continued)

Total

SOURCE	df	MS	F	OSL%
REP	3	0.077830	1.57	24.80
TRT	4	0.829032	16.70	0.02
ERROR	12	0.049648	-----	-----
TOTAL	19	0.218178	-----	-----

TABLE XLIV

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT OF NITROGEN
SOURCES, RATES AND METHOD OF APPLICATION, EXP. I (1973)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.554925	2.18	9.44
SOURCE	4	0.222653	0.88	51.63
RATE	2	0.611733	2.41	9.41
SOURCE * RATE	8	0.231093	0.91	51.34
METHOD	1	2.602610	10.24	0.23
SOURCE * METHOD	4	0.816943	3.21	1.63
RATE * METHOD	2	0.024460	0.10	90.79
SOURCE * RATE * METHOD	8	0.270620	1.06	39.53
ERROR	87	0.254157	-----	-----
TOTAL	119	0.301038	-----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.554885	6.25	0.10
SOURCE	4	0.920333	10.56	0.01
RATE	2	3.700621	42.44	0.01
SOURCE * RATE	8	0.248755	2.85	0.75
METHOD	1	0.590561	6.77	1.06
SOURCE * METHOD	4	0.429151	4.92	0.16
RATE * METHOD	2	0.566638	6.50	0.27
SOURCE * RATE * METHOD	8	0.097097	1.11	36.19
ERROR	87	0.087188	-----	-----
TOTAL	119	0.222772	-----	-----

TABLE XLIV (Continued)

Total

SOURCE	df	MS	F	OSL%
REP	3	1.792435	3.82	1.26
SOURCE	4	1.887390	4.03	0.51
RATE	2	7.319964	15.62	0.01
SOURCE * RATE	8	0.553515	1.18	31.93
METHOD	1	0.713654	1.52	21.82
SOURCE * METHOD	4	0.594839	1.27	28.76
RATE * METHOD	2	0.555980	1.19	31.02
SOURCE * RATE * METHOD	8	0.392697	0.84	57.28
ERROR	87	0.468693	-----	-----
TOTAL	119	0.673259	-----	-----

TABLE XLV

BERMUDAGRASS YIELDS AS AFFECTED BY NITROGEN SOURCES, RATES AND
METHOD OF APPLICATION, EXP. III (1971)

SOURCE	RATE	APPLIED	Ton/Acre. (Dry Yield)			TOTAL
			HAR. 1	HAR. 2	HAR. 3	
CHECK	0	0	0.158	0.135	0.056	0.349
B	50	1*	0.362	0.165	0.106	0.633
B+U	50	1	0.256	0.083	0.061	0.399
AN	50	1	0.560	0.186	0.158	0.904
U	50	1	0.530	0.185	0.138	0.853
SCU-30	50	1	0.503	0.111	0.097	0.711
B	100	1	0.308	0.112	0.108	0.528
B	100	2*	0.461	0.178	0.212	0.851
B	200	1	0.491	0.166	0.198	0.854
B	200	2	0.429	0.230	0.416	1.075
B	400	1	0.366	0.183	0.288	0.836
B	400	2	0.404	0.292	0.561	0.156
B+U	100	1	0.284	0.092	0.097	0.473
B+U	100	2	0.340	0.143	0.134	0.617
B+U	200	1	0.535	0.222	0.201	0.958
B+U	200	2	0.439	0.192	0.202	0.833
B+U	400	1	0.687	0.125	0.198	1.010
B+U	400	2	0.747	0.268	0.532	1.547
AN	100	1	0.973	0.184	0.239	1.396
AN	100	2	0.460	0.192	0.213	0.865
AN	200	1	1.163	0.239	0.600	2.002

TABLE XLV (Continued)

SOURCE	RATE	APPLIED	Ton/Acre (Dry Weight)			TOTAL
			HAR. 1	HAR. 2	HAR. 3	
AN	200	2	0.955	0.205	0.530	1.690
AN	400	1	1.209	0.227	0.938	2.374
AN	400	2	1.272	0.250	0.736	2.258
U	100	1	0.697	0.143	0.139	0.979
U	100	2	0.560	0.235	0.257	1.052
U	200	1	0.968	0.174	0.206	1.348
U	200	2	0.992	0.220	0.527	1.739
U	400	1	0.990	0.237	0.419	1.646
U	400	2	1.203	0.217	0.803	2.223
SCU-30	100	1	0.809	0.192	0.204	1.205
SCU-30	100	2	0.440	0.210	0.258	0.908
SCU-30	200	1	0.897	0.185	0.255	1.337
SCU-30	200	2	0.737	0.248	0.571	1.556
SCU-30	400	1	1.150	0.197	0.615	1.962
SCU-30	400	2	1.026	0.207	0.730	1.963
LSD .05 (Check + 50)			.1115	.072	.043	.173
LSD .05 (100, 200 + 400)			.184	.134	.218	.413

*1 = Fertilizer applied as a single application

**2 = Fertilizer applied as split applications

TABLE XLVI

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT OF NITROGEN SOURCES APPLIED AT 50 LB N/ACRE, EXP. III (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.017723	3.03	6.13
TRT	5	0.106706	18.26	0.01
ERROR	15	0.005843	-----	-----
TOTAL	23	0.029319	-----	-----

TABLE XLVI (Continued)

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.007428	3.29	4.93
TRT	5	0.007029	3.11	3.97
ERROR	15	0.002257	-----	-----
TOTAL	23	0.003969	-----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	3	0.002273	2.84	7.27
TRT	5	0.006600	8.24	0.09
ERROR	15	0.000800	-----	-----
TOTAL	23	0.002253	-----	-----

Total

SOURCE	df	MS	F	OSL%
REP	3	0.036009	2.74	7.91
TRT	5	0.209878	15.99	0.01
ERROR	15	0.013128	-----	-----
TOTAL	23	0.058884	-----	-----

TABLE XLVII

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT OF NITROGEN
SOURCES, RATES AND METHOD OF APPLICATION, EXP. III (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.494809	28.87	0.01
SOURCE	4	1.682937	98.18	0.01
RATE	2	1.328299	77.49	0.01
SOURCE * RATE	8	0.095569	5.58	0.01
METHOD	1	0.122816	7.17	0.87
SOURCE * METHOD	4	0.096933	5.66	0.07
RATE * METHOD	2	0.102025	5.95	0.41
SOURCE * RATE * METHOD	8	0.036816	2.15	3.91
ERROR	87	0.017141	-----	-----
TOTAL	119	0.118804	-----	-----

TABLE XLVII (Continued)

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.146148	16.07	0.01
SOURCE	4	0.006391	0.70	59.48
RATE	2	0.029855	3.28	4.09
SOURCE * RATE	8	0.003903	0.43	90.06
METHOD	1	0.049126	5.40	2.11
SOURCE * METHOD	4	0.005441	0.60	66.80
RATE * METHOD	2	0.002700	0.29	741.81
SOURCE * RATE * METHOD	8	0.005834	0.64	74.22
ERROR	87	0.009092	-----	-----
TOTAL	119	0.012344	-----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	3	0.042546	1.76	16.00
SOURCE	4	0.379048	15.65	0.01
RATE	2	1.489933	61.51	0.01
SOURCE * RATE	8	0.055709	2.30	2.73
METHOD	1	0.469876	19.40	0.01
SOURCE * METHOD	4	0.113522	4.69	0.21
RATE * METHOD	2	0.034463	1.42	24.53
SOURCE * RATE * METHOD	8	0.033016	1.36	22.35
ERROR	87	0.024221	-----	-----
TOTAL	119	0.070871	-----	-----

Total

SOURCE	df	MS	F	OSL%
REP	3	1.443987	16.68	0.01
SOURCE	4	3.803727	43.93	0.01
RATE	2	6.425641	74.22	0.01
SOURCE * RATE	8	0.209490	2.42	2.06
METHOD	1	0.309880	3.58	5.86
SOURCE * METHOD	4	0.403843	4.66	0.22
RATE * METHOD	2	0.231804	2.68	7.26
SOURCE * RATE * METHOD	8	0.077958	.90	52.06
ERROR	87	0.086578	-----	-----
TOTAL	119	0.374949	-----	-----

TABLE XLVIII

PERCENT NITROGEN IN BERMUDAGRASS FORAGE AS AFFECTED BY NITROGEN SOURCES,
RATES AND METHOD OF APPLICATION, EXP. III (1971)

SOURCE	RATE	APPLIED	% N in Forage		
			HAR. 1	HAR. 2	HAR. 3
CHECK	0	0	1.02	1.38	0.81
B	50	1*	1.32	1.60	0.87
B+U	50	1	1.15	1.13	0.80
AN	50	1	1.15	1.58	0.87
U	50	1	1.26	1.38	0.85
SCU-30	50	1	1.17	1.20	0.85
B	100	1	1.12	1.33	0.76
B	100	2**	1.59	1.75	0.79
B	200	1	1.64	1.58	0.90
B	200	2	1.90	1.78	1.13
B	400	1	1.95	1.55	1.10
B	400	2	2.29	1.75	1.60
B+U	100	1	1.12	1.30	0.75
B+U	100	2	1.30	1.63	0.79
B+U	200	1	1.54	1.63	0.78
B+U	200	2	1.44	1.53	1.08
B+U	400	1	1.66	1.45	0.90
B+U	400	2	1.60	1.63	1.27
AN	100	1	1.49	1.88	0.80
AN	100	2	1.30	1.60	0.99
AN	200	1	1.75	1.93	1.37
AN	200	2	1.53	1.88	1.48
AN	400	1	2.07	1.78	1.35
AN	400	2	1.75	1.35	1.91
U	100	1	1.27	1.20	0.85
U	100	2	1.25	1.60	0.86
U	200	1	1.59	1.35	1.02
U	200	2	1.50	1.65	1.26
U	400	1	1.69	1.58	1.10
U	400	2	1.68	1.40	1.63
SCU-30	100	1	1.33	1.58	0.86
SCU-30	100	2	1.05	1.63	0.91
SCU-30	200	1	1.77	1.58	1.15
SCU-30	200	2	1.44	1.53	1.14
SCU-30	400	1	2.13	1.83	1.28
SCU-30	400	2	1.82	1.45	1.76
LSD .05 (Check + 50)			.16	.49	.08
LSD .05 (100, 200, 400)			.30	.60	.28

*1 = Fertilizer applied as a single application

**2 = Fertilizer applied as split applications

TABLE XLIX

ANALYSIS OF VARIANCE ON PERCENT NITROGEN IN BERMUDAGRASS FORAGE FOR THE
EFFECT OF NITROGEN SOURCES APPLIED AT 50 LB N/ACRE, EXP. III (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.021144	1.82	18.54
TRT	5	0.042277	3.65	2.32
ERROR	15	0.011594	----	-----
TOTAL	23	0.019510	----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.326111	3.11	5.73
TRT	5	0.147000	1.40	27.84
ERROR	15	0.104778	----	-----
TOTAL	23	0.142826	----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	3	0.008367	2.96	6.56
TRT	5	0.003650	1.29	31.92
ERROR	15	0.002830	----	-----
TOTAL	23	0.003730	----	-----

TABLE L

ANALYSIS OF VARIANCE ON PERCENT NITROGEN IN BERMUDAGRASS FORAGE FOR THE
EFFECT OF NITROGEN SOURCES, RATES AND METHOD
OF APPLICATION, EXP. III (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	0.018810	0.41	74.64
SOURCE	4	0.318503	7.02	0.02
RATE	2	3.613548	79.70	0.01
SOURCE * RATE	8	0.055584	1.23	29.31
METHOD	1	0.033001	0.73	59.96
SOURCE * METHOD	4	0.416305	9.18	0.01
RATE * METHOD	2	0.039486	0.87	57.48
SOURCE * RATE * METHOD	8	0.018499	0.41	91.31
ERROR	87	0.045341	-----	-----
TOTAL	119	0.124976	-----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	0.121778	0.66	57.96
SOURCE	4	0.250292	1.36	25.13
RATE	2	0.091583	0.50	61.40
SOURCE * RATE	8	0.060542	0.33	95.17
METHOD	1	0.048000	0.26	61.62
SOURCE * METHOD	4	0.284458	1.55	19.31
RATE * METHOD	2	0.243250	1.33	26.95
SOURCE * RATE * METHOD	8	0.061583	0.34	94.93
ERROR	87	0.183215	-----	-----
TOTAL	119	0.169232	-----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	3	0.006309	0.15	92.41
SOURCE	4	0.510420	12.74	0.01
RATE	2	3.073848	76.71	0.01
SOURCE * RATE	8	0.069999	1.75	9.85
METHOD	1	1.752083	43.72	0.01
SOURCE * METHOD	4	0.010227	0.26	90.49
RATE * METHOD	2	0.486030	12.13	0.01
SOURCE * RATE * METHOD	8	0.020318	0.51	84.86
ERROR	87	0.040072	-----	-----
TOTAL	119	0.127581	-----	-----

TABLE LI

POUNDS OF NITROGEN PRODUCED FROM BERMUDAGRASS FORAGE AS AFFECTED BY
NITROGEN SOURCES, RATES AND METHOD OF APPLICATION, EXP. III (1971)

SOURCE	RATE	METHOD	Lb N/Acre From Forage			
			HAR. 1	HAR. 2	HAR. 3	TOTAL
CHECK	0	0	3.234	3.726	0.895	7.855
B	50	1*	9.745	5.563	1.843	17.151
B+U	50	1	5.973	2.015	0.978	8.966
AN	50	1	13.033	6.133	2.770	21.936
U	50	1	13.363	5.078	2.345	20.794
SCU-30	50	1	11.779	2.787	1.654	16.219
B	100	1	6.796	3.207	1.673	11.676
B	100	2**	14.800	6.898	3.323	25.021
B	200	1	16.029	5.817	3.503	25.389
B	200	2	16.425	8.027	10.160	34.612
B	400	1	14.117	5.650	6.719	16.486
B	400	2	18.655	9.829	14.859	43.343
B+U	100	1	6.377	2.833	1.466	10.676
B+U	100	2	8.915	4.822	2.161	15.898
B+U	200	1	16.865	7.579	3.176	27.620
B+U	200	2	12.435	6.132	4.098	22.665
B+U	400	1	22.739	3.866	3.449	30.054
B+U	400	2	24.102	8.934	13.311	46.347
AN	100	1	29.093	6.828	3.624	39.545
AN	100	2	14.215	6.301	4.228	24.744
AN	200	1	40.529	10.074	17.073	67.675
AN	200	2	29.327	8.057	15.649	53.033
AN	400	1	50.422	8.578	24.705	83.705
AN	400	2	45.629	8.561	27.807	81.996
U	100	1	17.479	3.497	2.370	23.346
U	100	2	14.018	7.859	4.408	26.285
U	200	1	30.803	4.684	4.083	39.571
U	200	2	29.864	7.246	13.762	50.872
U	400	1	32.980	7.921	9.147	50.047
U	400	2	44.646	7.507	25.797	77.950
SCU-30	100	1	21.521	6.415	3.560	31.497
SCU-30	100	2	8.791	7.195	4.736	20.722
SCU-30	200	1	31.729	6.001	5.759	43.488
SCU-30	200	2	21.525	8.564	12.778	42.594
SCU-30	400	1	49.223	7.486	16.305	73.014
SCU-30	400	2	37.117	7.221	25.506	69.843
LSD .05 (Check + 50)			3.866	3.125	.847	6.143
LSD .05 (100, 200, 400)			9.192	6.574	6.697	17.804

*1 = Fertilizer applied as a single application

**2 = Fertilizer applied as split applications

TABLE LII

ANALYSIS OF VARIANCE ON POUNDS OF NITROGEN PRODUCED FROM BERMUDAGRASS
FORAGE FOR THE EFFECT OF NITROGEN SOURCED APPLIED
AT 50 LB N/ACRE, EXP. III (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	17.587621	2.67	8.42
TRT	5	67.481108	10.25	0.04
ERROR	15	6.581776	-----	-----
TOTAL	23	21.256306	-----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	11.247098	2.63	8.87
TRT	5	10.689320	2.49	7.84
ERROR	15	4.300694	-----	-----
TOTAL	23	6.595579	-----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	3	0.820147	2.60	9.02
TRT	5	2.199251	6.96	0.18
ERROR	15	0.315851	-----	-----
TOTAL	23	0.791063	-----	-----

Total

SOURCE	df	MS	F	OSL%
REP	3	53.373067	3.21	5.27
TRT	5	139.062823	8.37	0.09
ERROR	15	16.621807	-----	-----
TOTAL	23	48.033062	-----	-----

TABLE LIII

ANALYSIS OF VARIANCE ON POUNDS OF NITROGEN PRODUCED FROM
BERMUDAGRASS FORAGE FOR THE EFFECT OF NITROGEN SOURCES,
RATES AND METHOD OF APPLICATION, EXP. III (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	3	562.91143	13.10	0.01
SOURCE	4	1933.00720	44.98	0.01
RATE	2	3908.10506	90.93	0.01
SOURCE * RATE	8	185.21616	4.31	0.04
METHOD	1	288.42897	6.71	1.09
SOURCE * METHOD	4	331.33435	7.71	0.01
RATE * METHOD	2	82.20123	1.91	15.18
SOURCE * RATE * METHOD	8	40.20171	0.94	50.74
ERROR	87	42.97697	-----	-----
TOTAL	119	206.36539	-----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	3	176.516412	8.06	0.02
SOURCE	4	18.715462	0.85	50.36
RATE	2	44.392931	2.03	13.57
SOURCE * RATE	8	4.140283	0.19	99.09
METHOD	1	68.799192	3.14	7.61
SOURCE * METHOD	4	14.714415	0.67	61.60
RATE * METHOD	2	4.411545	0.20	81.97
SOURCE * RATE * METHOD	8	9.204921	0.42	90.59
ERROR	87	21.891898	-----	-----
TOTAL	119	23.874232	-----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	3	50.70078	2.23	8.89
SOURCE	4	430.43431	18.95	0.01
RATE	2	1863.16059	82.01	0.01
SOURCE * RATE	8	90.12298	3.97	0.07
METHOD	1	769.53254	33.87	0.01
SOURCE * METHOD	4	60.07013	2.64	3.82
RATE * METHOD	2	168.21661	7.40	0.14
SOURCE * RATE * METHOD	8	15.28050	0.67	71.59
ERROR	87	22.71823	-----	-----
TOTAL	119	82.06824	-----	-----

TABLE LIII (Continued)

Total

SOURCE	df	MS	F	OSL%
REP	3	1746.6583	10.88	0.01
SOURCE	4	4597.7798	28.63	0.01
RATE	2	12487.5336	77.77	0.01
SOURCE * RATE	8	441.2530	2.75	0.95
METHOD	1	362.9703	2.26	13.24
SOURCE * METHOD	4	708.9807	4.42	0.30
RATE * METHOD	2	452.8827	2.82	6.33
SOURCE * RATE * METHOD	8	72.7982	0.45	88.54
ERROR	87	160.5689	-----	-----
TOTAL	119	592.8969	-----	-----

TABLE LIV

BERMUDAGRASS YIELDS, PERCENT NITROGEN IN THE FORAGE AND POUNDS OF
NITROGEN PRODUCED FROM FORAGE AS AFFECTED BY NITROGEN SOURCES,
RATES AND METHOD OF APPLICATION, EXP. III (1972)

SOURCE	RATE	METHOD	Yield	N From Forage	
			Dry Weight TON/ACRE	PERCENT N	LB N/ACRE
CHECK	0	0	0.231	1.28	5.852
B	50	1R*	0.417	1.60	15.908
B+U	50	1R	0.169	1.23	4.116
AN	50	1	0.654	1.53	19.933
U	50	1	0.569	1.60	18.494
SCU-30	50	1	0.576	1.50	17.434
B	100	1R	0.289	1.08	6.030
B	100	2R**	0.330	1.20	7.911
B	200	1R	0.464	1.25	11.541
B	200	2R	0.517	1.23	12.635
B	400	1R	0.491	1.18	11.850
B	400	2R	0.829	1.15	23.539
B+U	100	1R	0.175	1.23	4.268
B+U	100	2R	0.284	1.33	7.828
B+U	200	1R	0.287	1.38	7.899
B+U	200	2R	0.329	1.30	8.591
B+U	400	1R	0.351	1.68	11.474
B+U	400	2R	0.671	1.40	18.264
AN	100	1	1.047	1.98	41.254
AN	100	2	0.895	1.78	31.914

TABLE LIV (Continued)

SOURCE	RATE	METHOD	Yield	N From Forage	
			Dry Weight TON/ACRE	PERCENT N	LB N/ACRE
AN	200	1	0.914	2.45	44.470
AN	200	2	1.105	2.00	43.400
AN	400	1	1.072	2.20	47.874
AN	400	2	1.051	2.53	52.266
U	100	1	0.896	1.78	31.712
U	100	2	0.809	1.93	31.112
U	200	1	1.135	2.05	46.388
U	200	2	1.106	2.08	45.937
U	400	1	0.996	2.35	46.045
U	400	2	0.934	2.13	42.702
SCU-30	100	1	0.751	1.93	28.939
SCU-30	100	2	0.582	1.68	19.793
SCU-30	200	1	0.794	2.13	33.945
SCU-30	200	2	1.051	1.95	40.850
SCU-30	400	1	1.158	2.08	47.560
SCU-30	400	2	1.052	2.43	50.460
LSD .05 (Check + 50)			.260	.40	12.915
LSD .05 (Residual)			.200	.28	4.930
LSD .05 (Applied 100, 200, 400)			.377	.49	18.938

*1 = Fertilizer applied as a single application

**2 = Fertilizer applied as split application

TABLE LV

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT OF
NITROGEN SOURCES APPLIED AT 50 LB N/ACRE, EXP. III (1972)

SOURCE	df	MS	F	QSL%
REP	3	0.010228	0.34	79.70
TRT	5	0.158859	5.31	0.55
ERROR	15	0.029874	----	----
TOTAL	23	0.055351	----	----

TABLE LVI

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT OF
RESIDUAL BIURET SOURCES, EXP. III (1972)

SOURCE	df	MS	F	OSL%
REP	3	0.027337	1.41	25.56
SOURCE	1	0.226095	11.69	0.20
RATE	2	0.404178	20.89	0.01
SOURCE * RATE	2	0.011087	0.57	57.43
METHOD	1	0.271456	14.03	0.10
SOURCE * METHOD	1	0.000508	0.03	87.67
RATE * METHOD	2	0.096173	4.97	1.28
SOURCE * RATE * METHOD	2	0.002266	0.11	88.95
ERROR	33	0.019346	-----	-----
TOTAL	47	0.047785	-----	-----

TABLE LVII

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT OF
NITROGEN SOURCES, RATES AND METHOD OF
APPLICATION, EXP. III (1972)

SOURCE	df	MS	F	OSL%
REP	3	0.154102	2.18	10.02
SOURCE	2	0.085271	1.21	30.72
RATE	2	0.326921	4.63	1.40
SOURCE * RATE	4	0.111931	1.59	19.15
METHOD	1	0.006923	0.10	75.37
SOURCE * METHOD	2	0.007135	0.10	90.36
RATE * METHOD	2	0.122167	1.73	18.58
SOURCE * RATE * METHOD	4	0.022574	0.32	86.38
ERROR	51	0.070612	-----	-----
TOTAL	71	0.080162	-----	-----

TABLE LVIII

ANALYSIS OF VARIANCE ON PERCENT NITROGEN IN BERMUDAGRASS FORAGE FOR
THE EFFECT OF NITROGEN SOURCES AT 50 LB N/ACRE, EXP. III (1972)

SOURCE	df	MS	F	OSL%
REP	3	0.091528	1.34	29.98
TRT	5	0.107417	1.57	22.84
ERROR	15	0.068528	----	-----
TOTAL	23	0.079982	----	-----

TABLE LIX

ANALYSIS OF VARIANCE ON PERCENT NITROGEN IN BERMUDAGRASS FORAGE FOR
THE EFFECT OF RESIDUAL BIURET SOURCES, EXP. III (1972)

SOURCE	df	MS	F	OSL%
REP	3	0.021319	0.56	64.68
SOURCE	1	0.285208	7.54	0.95
RATE	2	0.195625	5.17	1.11
SOURCE * RATE	2	0.016458	0.43	65.64
METHOD	1	0.005208	0.14	71.39
SOURCE * METHOD	1	0.130208	3.44	6.92
RATE * METHOD	2	0.027708	0.73	50.74
SOURCE * RATE * METHOD	2	0.087708	2.32	11.25
ERROR	33	0.037835	----	-----
TOTAL	47	0.050811	----	-----

TABLE LX

ANALYSIS OF VARIANCE ON PERCENT NITROGEN IN BERMUDAGRASS
 FORAGE FOR THE EFFECT OF NITROGEN SOURCES, RATES AND
 METHOD OF APPLICATION, EXP. III (1972)

SOURCE	df	MS	F	OSL%
REP	3	0.007407	0.06	97.84
SOURCE	2	0.107639	0.92	59.12
RATE	2	1.187222	10.11	0.04
SOURCE * RATE	4	0.012431	0.11	97.70
METHOD	1	0.045000	0.38	54.56
SOURCE * METHOD	2	0.015417	0.13	87.72
RATE * METHOD	2	0.195000	1.66	19.84
SOURCE * RATE * METHOD	4	0.202292	1.72	15.84
ERROR	51	0.117407	-----	-----
TOTAL	71	0.139781	-----	-----

TABLE LXI

ANALYSIS OF VARIANCE ON POUNDS OF NITROGEN PRODUCED FROM BERMUDAGRASS
 FORAGE FOR THE EFFECT OF NITROGEN SOURCES AT
 50 LB N/ACRE, EXP. III (1972)

SOURCE	df	MS	F	OSL%
REP	3	47.245025	0.64	60.21
TRT	5	187.237606	2.55	7.30
ERROR	15	73.457923	----	----
TOTAL	23	94.773563	----	----

TABLE LXII

ANALYSIS OF VARIANCE ON POUNDS OF NITROGEN PRODUCED FROM BERMUDAGRASS
FORAGE FOR THE EFFECT OF RESIDUAL BIURET SOURCES, EXP. III (1972)

SOURCE	df	MS	F	OSL%
REP	3	12.117406	1.03	39.18
SOURCE	1	76.833182	6.55	1.46
RATE	2	390.070220	33.25	0.01
SOURCE * RATE	2	8.791401	0.75	51.54
METHOD	1	220.289526	18.78	0.03
SOURCE * METHOD	1	4.369465	0.37	55.26
RATE * METHOD	2	77.009249	6.56	0.43
SOURCE * RATE * METHOD	2	11.308841	0.96	60.61
ERROR	33	11.731918	-----	-----
TOTAL	47	36.156534	-----	-----

TABLE LXIII

ANALYSIS OF VARIANCE ON POUNDS OF NITROGEN PRODUCED FROM BERMUDAGRASS
FORAGE FOR THE EFFECT OF NITROGEN SOURCES, RATES AND
METHOD OF APPLICATION, EXP. III (1972)

SOURCE	df	MS	F	OSL%
REP	3	276.20217	1.55	21.11
SOURCE	2	261.92893	1.47	23.77
RATE	2	1821.09363	10.24	0.04
SOURCE * RATE	4	138.92101	0.78	54.49
METHOD	1	21.57988	0.12	72.90
SOURCE * METHOD	2	8.27047	0.05	95.47
RATE * METHOD	2	125.14076	0.70	50.40
SOURCE * RATE * METHOD	4	57.58784	0.32	86.12
ERROR	51	177.89518	-----	-----
TOTAL	71	213.26399	-----	-----

TABLE LXIV

BERMUDAGRASS YIELDS AS AFFECTED BY NITROGEN SOURCES, RATES AND
METHOD OF APPLICATION, EXP. IV (1971)

SOURCE	RATE	METHOD	Yield			
			Ton/Acre (Dry Weight)			
			HAR. 1	HAR. 2	HAR. 3	TOTAL
CHECK	0	0	0.307	0.412	0.431	1.150
B	50	1*	0.464	0.899	0.455	1.818
B+U	50	1	0.555	0.787	0.535	1.877
AN	50	1	0.751	0.684	0.515	1.950
U	50	1	0.658	0.745	0.449	1.852
SCU-30	50	1	0.667	0.719	0.467	1.853
B	100	1	0.593	1.300	0.407	2.300
B	100	2**	0.493	1.178	0.506	2.177
B	200	1	0.366	0.754	0.645	1.765
B	200	2	0.370	0.977	0.535	1.882
B	400	1	0.094	0.343	0.782	1.219
B	400	2	0.282	0.859	0.410	1.551
B+U	100	1	1.075	0.876	0.653	2.604
B+U	100	2	0.701	0.761	0.520	1.982
B+U	200	1	0.673	0.895	0.581	2.149
B+U	200	2	0.515	0.945	0.586	2.046
B+U	400	1	0.520	1.038	0.680	2.238
B+U	400	2	0.430	1.296	0.520	2.246
AN	100	1	0.863	1.077	0.572	2.512
AN	100	2	0.514	1.218	0.521	2.253
AN	200	1	0.891	1.448	0.770	3.109
AN	200	2	0.318	1.591	0.693	2.602
AN	400	1	0.775	1.642	0.854	3.271
AN	400	2	0.356	1.658	0.689	2.703
U	100	1	0.795	0.895	0.614	2.304
U	100	2	0.489	1.134	0.609	2.232
U	200	1	1.080	0.925	0.567	2.572
U	200	2	0.499	1.216	0.694	2.409
U	400	1	1.110	1.427	0.778	3.315
U	400	2	0.538	1.721	0.675	2.934
SCU-30	100	1	0.769	0.912	0.545	2.226
SCU-30	100	2	0.438	0.826	0.513	1.777
SCU-30	200	1	0.557	1.497	0.601	2.655
SCU-30	200	2	0.334	1.124	0.534	1.992
SCU-30	400	1	0.708	2.387	0.604	3.699
SCU-30	400	2	0.475	1.804	0.796	3.075
LSD .05 (Check + 50)			.243	.438	.167	.405
LSD .05 (100, 200, 400)			.331	.558	.191	.667

*1 = Fertilizer applied as a single application

**2 = Fertilizer applied as split applications

TABLE LXV

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT OF
NITROGEN SOURCES AT 50 LB N/ACRE, EXP. IV (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	2	0.084736	4.47	3.51
TRT	5	0.078331	4.38	2.27
ERROR	10	0.017883	----	----
TOTAL	17	0.043527	----	----

Har. 2

SOURCE	df	MS	F	OSL%
REP	2	0.099708	1.72	22.76
TRT	5	0.079363	1.37	31.37
ERROR	10	0.058011	----	----
TOTAL	17	0.069197	----	----

Har. 3

SOURCE	df	MS	F	OSL%
REP	2	0.000888	0.11	90.00
TRT	5	0.004940	0.59	71.11
ERROR	10	0.008398	----	----
TOTAL	17	0.006497	----	----

Total

SOURCE	df	MS	F	OSL%
REP	2	0.121952	2.46	13.47
TRT	5	0.264459	5.33	1.24
ERROR	10	0.049648	----	----
TOTAL	17	0.121334	----	----

TABLE LXVI

ANALYSIS OF VARIANCE ON BERMUDAGRASS YIELDS FOR THE EFFECT OF NITROGEN
SOURCES, RATES AND METHOD OF APPLICATION, EXP. IV (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	2	0.145534	2.65	7.72
SOURCE	4	0.371921	6.78	0.03
RATE	2	0.175990	3.21	4.64
SOURCE * RATE	8	0.103643	1.89	7.87
METHOD	1	1.678541	30.60	0.01
SOURCE * METHOD	4	0.191723	3.49	1.26
RATE * METHOD	2	0.015549	0.28	75.81
SOURCE * RATE * METHOD	8	0.028119	0.51	84.26
ERROR	58	0.054854	-----	-----
TOTAL	89	0.099358	-----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	2	0.037475	0.24	78.97
SOURCE	4	1.126302	7.23	0.02
RATE	2	1.263496	8.11	0.11
SOURCE * RATE	8	0.710035	4.56	0.04
METHOD	1	0.079329	0.51	51.49
SOURCE * METHOD	4	0.263980	1.69	16.24
RATE * METHOD	2	0.015117	0.10	90.71
SOURCE * RATE * METHOD	8	0.073269	0.47	87.22
ERROR	58	0.155698	-----	-----
TOTAL	89	0.264826	-----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	2	0.035525	1.94	15.03
SOURCE	4	0.053082	2.91	2.88
RATE	2	0.132941	7.28	0.19
SOURCE * RATE	8	0.015652	0.86	55.85
METHOD	1	0.072137	3.95	4.88
SOURCE * METHOD	4	0.022639	1.22	31.00
RATE * METHOD	2	0.023652	1.29	28.12
SOURCE * RATE * METHOD	8	0.013768	1.74	10.83
ERROR	58	0.018270	-----	-----
TOTAL	89	0.024688	-----	-----

TABLE LXVI (Continued)

Total

SOURCE	df	MS	F	OSL%
REP	2	0.162405	0.73	50.99
SOURCE	4	2.577287	11.60	0.11
RATE	2	1.244854	5.60	0.62
SOURCE * RATE	8	1.210912	5.45	0.01
METHOD	1	1.644843	7.40	0.85
SOURCE * METHOD	4	0.306219	1.37	25.18
RATE * METHOD	2	0.007534	0.03	96.71
SOURCE * RATE * METHOD	8	0.083550	0.37	92.89
ERROR	58	0.333182	-----	-----
TOTAL	89	0.441019	-----	-----

TABLE LXVII

PERCENT NITROGEN IN BERMUDAGRASS FORAGE AS AFFECTED BY NITROGEN SOURCES,
RATES AND METHOD OF APPLICATION, EXP. IV (1971)

SOURCE	RATE	METHOD	% N From Forage		
			HAR. 1	HAR. 2	HAR. 3
CHECK	0	0	2.33	1.87	1.70
B	50	1*	1.70	2.01	1.75
B+U	50	1	1.90	2.14	1.52
AN	50	1	1.77	2.20	1.62
U	50	1	1.70	2.25	1.66
SCU-30	50	1	1.80	2.05	1.67
B	100	1	1.53	2.22	1.83
B	100	2**	1.63	2.17	1.89
B	200	1	1.80	2.68	1.82
B	200	2	1.57	1.79	1.62
B	400	1	1.60	2.73	2.00
B	400	2	1.90	2.29	2.05
B+U	100	1	1.60	2.16	1.76
B+U	100	2	1.80	2.20	1.91
B+U	200	1	1.80	2.19	1.80
B+U	200	2	1.57	1.84	1.76
B+U	400	1	2.10	2.48	2.12
B+U	400	2	1.67	1.81	1.96
AN	100	1	2.07	2.15	1.79
AN	100	2	1.83	1.78	2.01
AN	200	1	2.03	2.62	1.80

TABLE LXVII (Continued)

SOURCE	RATE	METHOD	% N From Forage		
			HAR. 1	HAR. 2	HAR. 3
AN	200	2	1.87	1.62	2.18
AN	400	1	1.80	2.67	2.27
AN	400	2	1.80	2.05	2.49
U	100	1	1.60	2.09	1.60
U	100	2	1.63	2.10	1.81
U	200	1	1.57	2.47	1.76
U	200	2	1.63	2.27	1.99
U	400	1	1.80	2.15	1.88
U	400	2	1.60	2.02	2.35
SCU-30	100	1	1.67	2.17	1.82
SCU-30	100	2	1.90	2.03	1.76
SCU-30	200	1	1.73	2.12	2.09
SCU-30	200	2	1.67	1.76	2.04
SCU-30	400	1	1.70	2.46	2.15
SCU-30	400	2	1.83	1.99	2.23
LSD .05 (Check + 50)			.57	.36	.19
LSD .05 (100, 200, 400)			.34	.43	.30

*1 = Fertilizer applied as a single application

**2 = Fertilizer applied as split applications

TABLE LXVIII

ANALYSIS OF VARIANCE ON PERCENT NITROGEN IN BERMUDAGRASS FORAGE FOR THE EFFECT OF NITROGEN SOURCES AT 50 LB N/ACRE, EXP. IV (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	2	0.380000	3.90	5.51
TRT	5	0.173333	1.78	20.42
ERROR	10	0.097333	----	-----
TOTAL	17	0.152941	----	-----

TABLE LXVIII (Continued)

Har. 2

SOURCE	df	MS	F	OSL%
REP	2	0.088156	2.30	14.94
TRT	5	0.058832	1.54	26.22
ERROR	10	0.038249	----	-----
TOTAL	17	0.050174	----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	2	0.078606	7.16	1.18
TRT	5	0.018249	1.66	23.05
ERROR	10	0.010979	----	-----
TOTAL	17	0.021073	----	-----

TABLE LXIX

ANALYSIS OF VARIANCE ON PERCENT NITROGEN IN BERMUDAGRASS FORAGE FOR
THE EFFECT OF NITROGEN SOURCES, RATES AND
METHOD OF APPLICATION, EXP. IV (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	2	0.217333	3.78	2.77
SOURCE	4	0.194833	3.39	1.46
RATE	2	0.036333	0.63	53.97
SOURCE * RATE	8	0.046333	0.81	60.06
METHOD	1	0.016000	0.28	60.60
SOURCE * METHOD	4	0.064611	1.12	35.38
SOURCE * RATE * METHOD	8	0.057448	1.22	30.47
ERROR	8	0.069944	1.22	30.47
TOTAL	58	0.057448	-----	-----
	89	0.067371	-----	-----

TABLE LXIX (Continued)

Har. 2

SOURCE	df	MS	F	OSL%
REP	2	0.126930	1.38	25.98
SOURCE	4	0.140176	1.52	20.75
RATE	2	0.215403	2.33	10.39
SOURCE * RATE	8	0.131640	1.43	20.44
METHOD	1	3.188484	34.56	0.01
SOURCE * METHOD	4	0.183553	1.99	10.72
RATE * METHOD	2	0.439774	4.77	1.20
SOURCE * RATE * METHOD	8	0.057244	0.62	75.85
ERROR	58	0.092263	-----	-----
TOTAL	89	0.145056	-----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	2	0.063948	1.46	23.96
SOURCE	4	0.171547	3.91	0.72
RATE	2	0.920821	21.01	0.01
SOURCE * RATE	8	0.055832	1.27	27.43
METHOD	1	0.239218	5.46	2.16
SOURCE * METHOD	4	0.124698	2.85	3.14
RATE * METHOD	2	0.011148	0.25	77.95
SOURCE * RATE * METHOD	8	0.029062	0.66	72.29
ERROR	58	0.042826	-----	-----
TOTAL	89	0.074574	-----	-----

TABLE LXX

POUNDS OF NITROGEN PRODUCED FROM BERMUDAGRASS FORAGE AS AFFECTED BY
NITROGEN SOURCES, RATES AND METHOD OF APPLICATION, EXP. IV (1971)

SOURCE	RATE	APPLIED	Lb N/Acre From Forage			
			HAR. 1	HAR. 2	HAR. 3	TOTAL
CHECK	0	0	14.105	15.295	14.714	44.114
B	50	1*	15.683	36.378	15.885	69.946
B+U	50	1	21.202	34.927	16.249	72.378
AN	50	1	26.044	30.085	16.678	72.807
U	50	1	21.432	33.656	14.771	69.859

TABLE LXX (Continued)

SOURCE	RATE	APPLIED	Lb N/Acre From Forage			TOTAL
			HAR. 1	HAR. 2	HAR. 3	
SCU-30	50	1	24.270	28.767	15.444	68.481
B	100	1	17.476	57.735	14.876	90.087
B	100	2**	16.175	51.151	19.071	86.397
B	200	1	13.551	40.073	23.265	86.889
B	200	2	11.559	34.858	16.868	63.285
B	400	1	3.085	17.148	31.251	51.485
B	400	2	10.729	39.752	16.665	67.146
B+U	100	1	34.051	37.168	22.954	94.173
B+U	100	2	25.236	34.197	20.132	79.565
B+U	200	1	24.475	40.142	21.016	85.632
B+U	200	2	16.071	34.736	20.588	71.394
B+U	400	1	21.672	51.911	28.003	101.586
B+U	400	2	13.695	46.409	20.314	80.418
AN	100	1	37.658	45.458	20.486	103.602
AN	100	2	18.944	43.227	21.057	83.228
AN	200	1	36.300	76.901	27.872	141.073
AN	200	2	12.391	51.483	30.135	94.009
AN	400	1	27.440	88.155	38.884	154.479
AN	400	2	12.835	67.974	33.346	114.155
U	100	1	26.013	37.563	20.036	83.612
U	100	2	15.754	50.332	21.451	87.537
U	200	1	34.131	45.712	19.828	99.671
U	200	2	14.094	55.477	27.723	97.294
U	400	1	39.072	59.674	29.136	127.882
U	400	2	17.371	67.908	31.922	117.201
SCU-30	100	1	25.222	39.774	19.754	84.750
SCU-30	100	2	16.173	33.439	18.171	67.783
SCU-30	200	1	19.243	63.687	24.777	107.707
SCU-30	200	2	10.397	39.667	21.706	71.770
SCU-30	400	1	23.995	119.328	26.211	169.534
SCU-30	400	2	17.230	71.334	35.069	123.633
LSD .05 (Check +50)			10.647	20.337	4.957	20.156
LSD .05 (100, 200, 400)			13.616	28.353	7.564	32.534

*1 = Fertilizer applied as a single application

**2 = Fertilizer applied as split applications

TABLE LXXI

ANALYSIS OF VARIANCE ON POUNDS OF NITROGEN PRODUCED FROM BERMUDAGRASS
FORAGE FOR THE EFFECT OF NITROGEN SOURCES AT 50
LB N/ACRE, EXP. IV (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	2	113.238176	3.31	7.82
TRT	5	66.243347	1.93	17.51
ERROR	10	34.252070	----	-----
TOTAL	17	59.953752	----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	2	184.339111	1.47	27.43
TRT	5	177.576322	1.42	29.66
ERROR	10	124.976607	----	-----
TOTAL	17	147.430935	----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	2	5.001150	0.67	53.51
TRT	5	1.895170	0.26	92.96
ERROR	10	7.423451	----	-----
TOTAL	17	5.512509	----	-----

Total

SOURCE	df	MS	F	OSL%
REP	2	11.143498	0.09	91.34
TRT	5	354.506863	2.89	7.21
ERROR	10	122.759020	----	-----
TOTAL	17	177.788324	----	-----

TABLE LXXII

ANALYSIS OF VARIANCE ON POUNDS OF NITROGEN PRODUCED FROM BERMUDAGRASS
FORAGE FOR THE EFFECT OF NITROGEN SOURCES, RATES AND
METHOD OF APPLICATION, EXP. IV (1971)

Har. 1

SOURCE	df	MS	F	OSL%
REP	2	42.01153	0.45	64.35
SOURCE	4	482.94870	5.21	0.15
RATE	2	187.14085	2.02	14.01
SOURCE * RATE	8	112.05166	1.21	30.96
METHOD	1	2394.17855	25.82	0.01
SOURCE * METHOD	4	306.54999	3.31	1.64
RATE * METHOD	2	32.01273	0.35	71.44
SOURCE * RATE * METHOD	8	25.97755	0.28	96.93
ERROR	58	92.69890	-----	-----
TOTAL	89	141.07049	-----	-----

Har. 2

SOURCE	df	MS	F	OSL%
REP	2	330.59762	0.82	55.20
SOURCE	4	2048.03970	5.10	0.17
RATE	2	3208.18383	7.98	0.12
SOURCE * RATE	8	1518.98690	3.78	0.15
METHOD	1	969.97417	2.41	12.19
SOURCE * METHOD	4	967.85621	2.41	5.88
RATE * METHOD	2	174.01640	0.43	65.64
SOURCE * RATE * METHOD	8	280.37110	0.69	69.38
ERROR	58	401.95305	-----	-----
TOTAL	89	653.56511	-----	-----

Har. 3

SOURCE	df	MS	F	OSL%
REP	2	91.095114	3.18	4.74
SOURCE	4	176.927024	6.18	0.05
RATE	2	657.341994	22.98	0.01
SOURCE * RATE	8	37.137930	1.30	26.20
METHOD	1	19.966632	0.70	58.82
SOURCE * METHOD	4	66.611064	2.33	6.59
RATE * METHOD	2	29.717979	1.04	36.16
SOURCE * RATE * METHOD	8	57.491334	2.01	6.07
ERROR	58	28.606805	-----	-----
TOTAL	89	55.805145	-----	-----

TABLE LXXII (Continued)

Total

SOURCE	df	MS	F	OSL%
REP	2	328.36876	0.62	54.61
SOURCE	4	5089.84105	9.62	0.01
RATE	2	5136.16524	9.70	0.04
SOURCE * RATE	8	2348.72401	4.44	0.05
METHOD	1	7147.54522	13.51	0.08
SOURCE * METHOD	4	1208.50889	2.28	7.03
RATE * METHOD	2	323.49736	0.61	55.10
SOURCE * RATE * METHOD	8	181.26973	0.34	94.52
ERROR	58	529.23146	-----	-----
TOTAL	89	1065.75710	-----	-----

4
VITA

Lawrence George Bohl

Candidate for the Degree of

Master of Science

Thesis: THE EFFECT OF NITROGEN SOURCES, RATES AND APPLICATION METHOD
ON BERMUDAGRASS PRODUCTION

Major Field: Agronomy

Biographical:

Personal Data: Born in Walsh, Colorado, May 31, 1948, the son
of George and Odessa Bohl.

Education: Graduated from Walsh High School, Walsh, Colorado,
May 1966, received the Bachelor of Science degree from
Oklahoma Panhandle State University in 1971; completed the
requirements for a Master of Science degree in May 1976.

Professional Experience: Worked at Goodwell Research Station
1969-1971; Research Assistant at Oklahoma State University
1971-1973; Research Technician at Oklahoma State University
1973-1975.