DATA REPORT ON NITROGEN IN RICE

RESULTS PRESENTED AT THE SARP WORKSHOP

"NUTRIENTS, WATER & ROOTS"

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Preface

This report is a compilation of experimental data on nitrogen in rice. The data were compiled as a result of the SARP-workshop on the theme "Water, Nutrients and Roots", held at the Universiti Pertanian Malaysia, May 6 to 11, 1991. The corresponding experiments, were carried out within the framework of the SARP-project, by researchers of National Agricultural Research Centres in Asia.

The report contains datasets from six locations in three countries (India, Indonesia and China). It is not a complete overview of results obtained in this field, since not all the researchers involved could attend the workshop.

This compilation serves two purposes. Firstly, it provides data to be used in futher development of deterministic models for nitrogen limited rice production. Secondly, it offers the researcher the possibility to compare his/her data with those collected by colleagues elsewhere, and to check the data on possible errors.

The participants of the workshop were asked to bring available data on dry weight, nitrogen uptake and nitrogen content of root, stem, leaf and grain. A list of the data sets, with information about the source, location and design of the experiments is given in Chapter 1. The actual data are listed in the data sheets in Chapter 2. From the basic data the following relations were derived: leaf/stem ratio versus time, root/shoot ratio versus time, root mass versus time, nitrogen content of leaf, stem, root and grain versus time. Data sheets and charts with these relations are listed in Chapter 3.

This report is sent to all participants of the workshop. It has been compiled for internal use by SARP participants. The use of these data for publication, is not allowed without permission of the reseacher who originally collected them.

1. LIST OF DATA SETS

datafile:	BUDHAR.XLS
code:	BUD
location:	TAMIL NADU, INDIA
data source:	Budhar
year:	wet season 1989-1990
variety:	variable; IET 9276, IET 9572, IET 8362, IR 20, ADT 38
application:	0, 80, 160 kg N/ha
treatment:	
time:	DAT= days after transplanting 48 days before transplanting

WEIGHTS PLANT ORGANS (KG/HA)
organs: leaf, stem, root
N CONTENT (%) PLANT ORGANS
organs: leaf, stem, root, grain

datafile:	TMT.XLS
code:	TMT
location:	TAMIL NADU (INDIA)
data source:	Thiyagarajan
year:	1988-1989
variety:	ADT 39
application:	0,100, 200, 300, 400 kg N/ha
treatment:	---
time:	DAT= days after tranplanting seedling age 39 days

WEIGHTS PLANT ORGANS (KG/HA)
organs: leaf, stem, root, panicle
N CONTENT (%) PLANT ORGANS
organs: leaf, stem, root, panicle

datafile: MHD.XLS

code: MHD
location: TAMIL NADU (INDIA)
data source: Mohandass
year: 1990
variety: IR 50
application: 100 (T2), 150 (T1) kg N/ha
treatments: plantingdates: June 30 (D1),July 11 (D2), July 26 (D3)
time: DAT= days after transplanting

WEIGTHS (KG/HA) COMPONENTS
organs: leaf, total
N CONTENT (%) PLANT ORGANS
organs: leaf
GRAIN YIELD (KG/HA)

datafile: RAMAS.XLS

code: RAM
location: TAMIL NADU
data source: Ramasamy
year: june- october 1990 wetland
variety: IR 50
application: 100, 150, 200 kgN/ha
treatments: without provision for drainage,
open drainage at 60 cm
time: DAT= days after transplanting
H = harvest

WEIGHTS PLANT ORGANS (KG/HA)
organs: root
GRAIN YIELD (KG/HA)
N CONTENT (%) PLANT ORGANS
organs: root
NITROGEN UPTAKE (KG/HA)
not used

datafile: RAO.XLS

code: RAO
location: CUTTACK (INDIA)
data source: Rao/Dash
year: dry season 1990
variety: IR 36
application: 0, 50, 100, 150 kgN/ha
treatment: ---
time: DAT=days after transplanting
30 days before planting

WEIGHTS PLANT ORGANS (KG/HA)
organs: root, leaf, stem, grain
N-UPTAKE PLANT ORGANS (KG/HA)
organs: leaf, stem, root, grain
N CONTENT (%) PLANT ORGANS
organs: leaf, stem, root, grain

datafile: PANT.XLS

code: PANT
location: PANTNAGAR (INDIA)
data source: Mishra
year: 1987, wet season
variety: PD 4
application: 0, 60, 120, 180, 240 kg N/ha
treatments: all: basal + 25 + 45 (50% basal, 25%, 25%) except 60;
for 60: basal + 45 (50 %, 50%)
time: DAT= days after transplanting

WEIGHTS PLANT ORGANS (KG/HA)
organs: root
N-UPTAKE PLANT ORGANS (KG/HA)
organs: whole plant

datafile: AAN.XLS

code: AAN
location: BANDUNG, GARUT (INDONESIA)
data source: A. Daradjat
year: 1990, dry season
variety: IR 64
application: 45, 90, 135, 180 kg N/ha
treatment: location Bandung and Garut
1. liquid single, 2. liquid split,
3. briquet single, 4. briquet split
time: harvest time

WEIGHTS PLANT ORGANS (KG/HA)
organs: whole plant
N CONTENT (%) PLANT ORGANS
organs: whole plant

more data expected on N-content in different plant organs

datafile: MAKARIM.XLS

code: MAKARIM
location: BOGOR (INDONESIA)
data source: A.K. Makarim
year: 1989-1990 rainy season
variety: IR 64
application: 0,50,100,150 kgN/ha
treatment:
time: harvest at 115 DAT
21 days befor transplanting

WEIGHTS PLANT ORGANS (KG/HA)
organs: leaf, stem, root, grain
organ: whole plant (=sum leaf + stem +(grain))
N CONTENT (%) PLANT ORGANS
organs: whole plant no data available for grain only
N-UPTAKE PLANT ORGANS (KG/HA)
organs: whole plant

datafile: ZHANG.XLS

code: ZHA
location: CNRRI, HANGZHOU, CHINA
data source: Zhang Xiufu
year: april-july 1988
variety: variable
application: 0,75,150,225,300 kg N/ha
time: DATEB: 126 for Zhong 156 (1988-1989); 210 for H129

	harvest: days after transplanting				
treatment	0	75	150	225	300
Zhong-156, 88	72	73	74	75	75
Zhong-156, 89	74	75	76	78	78
H129	84	86	89	89	89

WEIGHTS PLANT ORGANS (KG/HA)
organs: (leaf+stem), grain

code: BUD
location: TAMIL NADU, INDIA
data source: Budhar
year: wet season 1989-1990
variety: variable; IET 9276, IET 9572, IET 8362, IR 20, ADT 38
application: 0, 80, 160 kg N/ha
treatment:
time: DAT= days after transplanting
48 days before transplanting

WEIGHTS PLANT ORGANS (KG/HA)
organs: leaf, stem, root

variety: IET 9276

	0 kg N/ha			80 kg N/ha			160 kg N/ha		
time	leaf	stem	root	leaf	stem	root	leaf	stem	root
0	80	72	33	80	72	33	80	72	33
33	827	856	279	902	937	376	931	975	421
53	1103	2812	586	1873	2873	753	1785	3945	814
63	1194	2050	677	2282	3463	882	4670	4963	908
87	1202	3408	792	1287	3703	735	1726	4546	1067

variety: IET 9572

	0 kg N/ha			80 kg N/ha			160 kg N/ha		
time	leaf	stem	root	leaf	stem	root	leaf	stem	root
0	109	100	46	109	100	46	109	100	46
33	637	705	301	725	774	329	750	712	367
53	1345	2494	592	2127	3377	912	2484	3672	917
63	1741	6331	1174	2373	7901	1372	2893	8901	1488
87	1430	3882	937	1562	3963	1052	2287	5145	1167

variety: IET 8362

	0 kg N/ha			80 kg N/ha			160 kg N/ha		
time	leaf	stem	root	leaf	stem	root	leaf	stem	root
0	160	169	63	160	169	63	160	169	63
33	720	862	372	816	925	385	975	1073	425
53	1054	2107	537	1341	2116	542	1752	2910	666
63	1836	4093	870	2596	4479	992	2313	5059	919
87	1302	2615	603	1922	3057	933	1613	3592	710

variety: IR 20

	0 kg N/ha			80 kg N/ha			160 kg N/ha		
time	leaf	stem	root	leaf	stem	root	leaf	stem	root
0	43	56	28	43	56	28	43	56	28
33	703	751	318	742	857	387	960	1007	411
53	1243	2286	616	1449	2042	645	2012	2334	1029
63	2107	6753	1292	2295	8417	1511	2717	8485	1821
87	1221	2893	727	1375	3446	1357	1772	3604	934

variety: ADT 38

	0 kg N/ha			80 kg N/ha			160 kg N/ha		
time	leaf	stem	root	leaf	stem	root	leaf	stem	root
0	78	77	33	78	77	33	78	77	33
33	630	750	362	746	800	367	820	846	372
53	1277	2418	670	1699	2814	770	2097	2705	891
63	1615	4768	945	1997	4558	1116	2396	4784	1077
87	1043	2457	667	1403	2952	822	2172	4600	1092

N CONTENT (%) PLANT ORGANS

organs: leaf, stem, root, grain

variety: IET 9276

	0 kg N/ha				80 kg N/ha				160 kg N/ha			
time	leaf	stem	root	grain	leaf	stem	root	grain	leaf	stem	root	grain
0	1.06	0.9	0.73		1.06	0.9	0.73		1.06	0.90	0.73	
33	1.68	1.01	0.9		1.85	1.01	0.95		1.51	0.95	0.84	
53	1.68	0.9	0.67	0.9	1.06	0.9	0.78	0.7	2.24	1.06	1.01	1.10
63	1.06	0.95	0.73	0.8	1.68	1.29	0.67	1.3	1.4	0.62	0.78	0.90
87	0.74	0.74	0.74	1	1.06	0.67	0.73	0.8	0.84	0.73	0.78	0.60

variety: IET 9572

	0 kg N/ha				80 kg N/ha				160 kg N/ha			
time	leaf	stem	root	grain	leaf	stem	root	grain	leaf	stem	root	grain
0	0.8	1.23	0.76		0.8	1.23	0.76		0.8	1.23	0.76	
33	1.23	1.23	1.06		1.46	1.18	1.18		1.51	1.12	0.90	
53	1.96	0.95	0.9		2.02	0.34	0.84		2.07	1.12	0.84	
63	0.62	0.45	0.62	0.6	0.67	0.84	0.62	0.7	1.34	1.01	0.73	0.50
87	0.84	0.67	0.56	0.5	0.67	0.67	0.84	0.9	1.18	0.45	0.78	1.00

variety: IR 20

	0 kg N/ha				80 kg N/ha				160 kg N/ha			
time	leaf	stem	root	grain	leaf	stem	root	grain	leaf	stem	root	grain
0	0.67	1.12	0.56		0.67	1.12	0.56		0.67	1.12	0.56	
33	1.29	0.9	0.73		1.01	1.12	0.62		1.57	0.73	0.17	
53	0.39	0.22	0.67	1	1.29	0.5	0.84		1.85	1.23	1.12	
63	1.06	0.5	0.62	0.5	0.95	0.73	0.67	0.7	0.84	0.95	0.73	0.60
87	0.5	0.78	0.56	0.7	0.56	0.5	0.67	0.6	0.78	0.62	0.67	0.60

variety: ADT 38

	0 kg N/ha				80 kg N/ha				160 kg N/ha			
time	leaf	stem	root	grain	leaf	stem	root	grain	leaf	stem	root	grain
0	0.67	1.12	0.56		0.67	1.12	0.56		0.67	1.12	0.56	
33	1.46	1.06	1.06		1.34	1.01	1.01		2.19	1.18	1.06	
53	1.62	0.95	0.67	1.1	1.96	0.9	1.01	1.2	1.9	1.23	1.18	0.06
63	1.12	0.67	0.78	0.9	1.5	0.62	0.67	0.7	2.02	1.79	1.46	0.57
87	1.29	0.9	0.45	1.5	1.23	0.78	0.51	1	1.29	1.12	0.85	0.79

variety: IET 8362

	0 kg N/ha				80 kg N/ha				160 kg N/ha			
time	leaf	stem	root	grain	leaf	stem	root	grain	leaf	stem	root	grain
0	1.12	0.67	0.56		1.12	0.67	0.56		1.12	0.67	0.56	
33	1.57	0.67	0.78		1.62	0.78	0.62		1.18	1.01	0.73	
53	1.85	0.95	0.84	0.9	1.85	1.01	0.73	1	1.18	1.01	0.90	0.90
63	0.84	0.5	0.5	0.9	1.12	0.67	0.78	0.9	1.57	1.18	0.73	0.90
87	0.67	0.5	0.73	0.9	1.12	0.62	0.78	0.9	0.78	0.67	0.84	0.90

code: TMT
location: TAMIL NADU (INDIA)
data source: Thiyagarajan
year: 1988-1989
variety: ADT 39
application: 0,100, 200, 300, 400 kg N/ha
treatment: ---
time: DAT= days after transplanting
seedling age 39 days

WEIGHTS PLANT ORGANS (KG/HA)
organs: leaf, stem, root, panicle

	0 kg N/ha				100 kg N/ha				200 kg N/ha			
time	leaf	stem	root	panicle	leaf	stem	root	panicle	leaf	stem	root	panicle
0	38	47	19		38	47	19		38	47	19	
18	420	286	260		522	394	377		555	429	491	
25	715	469	326		1028	717	494		1238	1103	620	
32	1165	715	370		1710	1047	590		2253	1590	764	
39	1673	828	421		2312	1281	672		3143	1868	880	
46	2115	943	463		2974	1448	734		3992	2140	930	
53	2630	936	482		3904	1628	848		5029	2361	1120	
63	2146	840	537	1317	4505	1765	836	1536	5338	2759	1183	1712
81	1883	792	530	2803	3691	1680	836	4520	4139	2304	997	5413
89	1615	767	530	3456	3216	1616	836	5525				
94									3067	1530	950	6706
97												

	300kg N/ha				400kg N/ha			
time	leaf	stem	root	panicle	leaf	stem	root	panicle
0	38	47	19		38	47	19	
18	640	571	500		718	652	521	
25	1438	1300	710		1612	1438	775	
32	2385	2080	925		2650	2500	1030	
39	3257	2695	1150		3855	3329	1250	
46	4221	3150	1324		4627	4009	1525	
53	5500	3486	1502		5736	4707	1750	
63	6073	3899	1790	2542	6619	5624	2003	1426
81	5136	3761	1507	4763	5021	4285	1968	5365
89								
94	3828	2808	1507	6450				
97					4558	3208	1968	6337

N CONTENT (%) PLANT ORGANS
organs: leaf, stem, root, panicle

	0 kg N/ha				100 kg N/ha				200 kg N/ha			
time	leaf	stem	root	panicle	leaf	stem	root	panicle	leaf	stem	root	panicle
0	1.68	3.15	0.34		1.68	3.15	0.34		1.68	3.15	0.34	
18	1.38	2.35	0.53		1.76	2.62	0.90		1.90	2.90	0.98	
25	0.83	2.00	0.51		1.52	2.62	0.82		1.97	3.17	0.87	
32	0.97	2.07	0.55		1.24	2.62	0.86		1.38	2.76	0.90	
39	1.03	2.07	0.83		1.03	2.40	0.91		1.24	2.62	1.03	
46	0.94	1.93	0.78		1.13	2.16	0.84		1.25	2.31	1.03	
53	0.99	1.45	0.81		1.15	2.21	0.84		1.24	2.41	1.03	
63	0.64	1.10	0.78		0.84	1.82	0.84		1.24	2.21	1.02	
81	0.53	0.97	0.70		0.69	1.20	0.76		1.03	1.38	0.90	
89	0.48	0.70	0.64		0.53	0.84	0.64					
94									0.62	0.94	0.78	
97				1.11				1.24				1.54

	300kg N/ha				400kg N/ha			
time	leaf	stem	root	panicle	leaf	stem	root	panicle
0	1.68	3.15	0.34		1.68	3.15	0.34	
18	2.21	3.24	1.12		2.41	4.00	1.20	
25	2.34	3.93	0.95		2.67	4.14	1.03	
32	1.79	3.65	1.03		2.07	3.65	1.34	
39	1.65	3.24	1.29		1.76	3.38	1.68	
46	1.57	2.84	1.16		1.62	2.83	1.59	
53	1.31	2.68	1.14		1.60	2.72	1.51	
63	1.31	2.49	1.12		1.48	2.72	1.38	
81	1.11	1.69	1.01		1.29	2.24	1.12	
89								
94	0.80	0.95	0.90					
97				1.72	1.06	0.98	1.06	1.77

code: MHD
location: TAMIL NADU (INDIA)
data source: Mohandass
year: 1990
variety: IR 50
application: 100 (T2), 150 (T1) kg N/ha
treatments: plantingdates: June 30 (D1),July 11 (D2), July 26 (D3)
time: DAT= days after transplanting

WEIGTHS (KG/HA) COMPONENTS
organs: leaf, total

D1T1

time	150 kg N/ha leaf	total
0	85	175
10	245	416
24	865	1445
39	1890	4480
45	2506	5550
49	2650	6162
52	2599	6890
59	2433	8265
66	2231	9567
73	2189	10555
80	2089	11338
83	1990	11602

D3T2

time	100 kg N/ha leaf	total
0	50	105
13	165	325
20	365	655
30	650	1675
40	1008	2955
50	987	4330
55	1000	
64	850	6301
78	760	7551

GRAIN YIELD (KG/HA)

	D1T1	D1T2	D2T1	D2T2	D3T1	D3T2
kg N/ha	150	100	150	100	150	100
harvest	6650	4920	5450	4320	4680	3920

N CONTENT (%) PLANT ORGANS

organs: leaf

	D1T1	D1T2
	kg N/ha	
time	150	100
0	5.77	5.77
12	6.11	5.83
24	6.79	6.20
39	6.58	5.85
45	6.02	5.55
52	6.55	5.93
59	5.95	5.26
66	5.27	4.92
73	4.47	3.55
80	4.02	0.00
81	0.00	3.78
83	3.89	0.00

	D2T1	D2T2
	kg N/ha	
time	150	100
0	5.45	5.45
9	5.11	5.57
24	5.79	5.32
30	5.99	5.50
37	5.89	4.91
51	6.01	4.42
58	4.97	4.04
65	4.06	3.02
72	3.70	2.54
79	0.00	2.03
82	3.00	0.00

	D3T1	D3T2
	kg N/ha	
time	150	100
0	5.32	5.32
13	5.50	5.21
20	5.00	4.87
30	5.50	5.09
40	4.86	4.07
50	5.23	3.77
55	4.52	2.09
64	3.74	1.88
74	2.42	1.65
79	0.00	1.50
81	2.05	0.00

code: RAM
location: TAMIL NADU
data source: Ramasamy
year: june- october 1990 wetland
variety: IR 50
application: 100, 150, 200 kgN/ha
treatments: without provision for drainage,
open drainage at 60 cm
time: DAT = days after transplanting
H = harvest

WEIGHTS PLANT ORGANS (KG/HA)
organs: root

	no drainage			drainage		
	kg N/ha			kg N/ha		
time	100	150	200	100	150	200
30	407	412	423	420	432	441
40	937	953	983	939	957	993
50	1225	1277	1326	1297	1383	1435
60	1381	1437	1544	1426	1534	1586
70	1332	1471	1537	1500	1535	1610
80	1235	1315	1401	1403	1450	1467
H	93	109	113	121	126	127

GRAIN YIELD (KG/HA)

	no drainage			drainage		
	kg N/ha			kg N/ha		
	100	150	200	100	150	200
H	6990	7135	6677	7501	7857	8143

N CONTENT (%) PLANT ORGANS
organs: root

	no drainage			drainage		
	kg N/ha			kg N/ha		
	100	150	200	100	150	200
30	0.91	0.92	0.9	0.82	0.9	0.91
40	0.92	1.02	1.01	0.95	1.14	1.16
50	0.85	0.76	0.72	0.96	1.15	1.16
60	0.68	0.52	0.5	1.01	1.13	1.15
70	0.52	0.49	0.48	0.91	1.11	1.12
80	0.44	0.42	0.39	0.86	1.08	1.13
H	0.4	0.4	0.38	0.82	1.01	1.05

NITROGEN UPTAKE (KG/HA)
not used

	no drainage			drainage		
	kg N/ha			kg N/ha		
time	100	150	200	100	150	200
30	24	30.1	32	23.9	29.4	30.7
40	55.1	74.2	80.5	51.1	69.2	77.4
50	88	125.8	132.1	85	118.8	125.5
60	98	136	138.2	100.1	135.9	142.8
70	106.1	140	139	110	146.7	153.6
80	109.1	143	139.7	115.3	151.8	159.1
H	110	144.1	140	116.3	153.6	161.6

RAO.XLS

code: RAO
location: CUTTACK (INDIA)
data source: Rao/Dash
year: dry season 1990
variety: IR 36
application: 0, 50, 100, 150 kgN/ha
treatment: —
time: DAT=days after transplanting
30 days before planting

WEIGHTS PLANT ORGANS (KG/HA)
organs: leaf, stem, root, grain

	0 kg N/ha				50 kg N/ha			
time	leaf	stem	root	grain	leaf	stem	root	grain
38	32	48	44		32	48	44	
58	272	267	223		270	289	237	
68	440	745	323		528	809	523	
78	679	1441	605		888	1766	743	
98	872	2420	602		1202	3088	905	
108	761	5253	500		1058	6770	861	
130	776	2225	500	4246	1064	3075	820	6095

	100 kg N/ha				150 kg N/ha			
time	leaf	stem	root	grain	leaf	stem	root	grain
38	32	48	44		32	48	44	
58	333	338	286		366	341	333	
68	726	1042	539		872	1023	561	
78	1292	2431	979		1576	2585	1078	
98	1537	3985	1116		1898	4202	1317	
108	1284	7320	952		1589	8349	932	
130	1191	3314	858	6915	1485	3303	899	7326

N-UPTAKE PLANT ORGANS (KG/HA)
organs: leaf, stem, root, grain

	0 kg N/ha				50 kg N/ha			
time	leaf	stem	root	grain	leaf	stem	root	grain
58	13.30	5.00	3.70		11.40	4.60	4.30	
98	19.60	31.70	6.50		32.80	42.90	9.80	
118	18.50	34.40	4.90	5.20	26.50	47.80	6.90	10.20
130				61.20				91.20

	100 kg N/ha				150 kg N/ha			
time	leaf	stem	root	grain	leaf	stem	root	grain
58	15.00	6.20	4.80		18.70	6.20	5.30	
98	43.00	65.30	12.60		64.10	75.20	13.20	
118	31.50	61.50	7.50	18.50	32.80	62.20	8.10	28.40
130				122.50				161.00

N CONTENT (%) PLANT ORGANS
organs: leaf, stem, root, grain

	0 kg N/ha				50 kg N/ha			
time	leaf	stem	root	grain	leaf	stem	root	grain
0	2.18		1.60		2.18		1.60	
38	1.89	4.88	1.64		1.60	4.22	1.82	
98	1.31	2.25	1.09		1.31	2.80	1.09	
108	0.91	1.79	0.91	1.74	1.02	2.15	0.98	1.89
118	0.69	1.42	0.91	1.11	0.62	1.71	1.02	1.13
130				1.00				1.09

	100 kg N/ha				150 kg N/ha			
time	leaf	stem	root	grain	leaf	stem	root	grain
0	2.18		1.60		2.18		1.60	
38	1.82	4.51	1.67		1.82	5.10	1.57	
98	1.64	2.73	1.13		1.79	3.38	1.38	
108	1.10	2.11	0.94	1.92	1.13	2.19	0.98	1.99
118	0.69	1.71	0.88	1.24	0.91	2.40	1.05	1.60
130				1.30				1.45

code: PANT
location: PANTNAGAR (INDIA)
data source: Mishra
year: 1987, wet season
variety: PD 4
application: 0, 60, 120, 180, 240 kg N/ha
treatments: all: basal + 25 + 45 (50% basal, 25%, 25%) except 60; for 60: basal + 45 (50 %, 50%)
time: DAT= days after transplanting

WEIGHTS PLANT ORGANS (KG/HA)
organs: root

	kg N/ha				
time	0	60	120	180	240
25	317	353	414	479	515
45	638	745	1034	1276	1500
67	1016	1280	1554	1664	2041

N-UPTAKE PLANT ORGANS (KG/HA)
organs: whole plant

	kgN/ha				
time	0	60	120	180	240
25	12.8	19.8	25.2	32.6	40.6
45	25.4	35.1	69.7	98.4	115.3
67	43.8	77.2	110.8	136.8	151.2
103	53	87.9	114.2	142.8	158.3

code: AAN
location: BANDUNG, GARUT (INDONESIA)
data source: A. Daradjat
year: 1990, dry season
variety: IR 64
application: 45, 90, 135, 180 kg N/ha
treatment: location Bandung and Garut
1. liquid single, 2. liquid split,
3. briquet single, 4. briquet split
time: harvest time

WEIGHTS PLANT ORGANS (KG/HA)
organs: whole plant

	liquid single kg N/ha				liquid split kg N/ha			
	45	90	135	180	45	90	135	180
BANDUNG	4800	5200	5400	5900	5400	5700	5800	7200
GARUT	5000	5500	6000	6800	5300	5700	6300	6800

	briquet single kg N/ha				briquet split kg N/ha			
	45	90	135	180	45	90	135	180
BANDUNG	5300	6300	6700	7600	5200	5500	6300	6800
GARUT	5200	6000	6100	6900	5500	6100	6600	7700

N CONTENT (%) PLANT ORGANS
organs: whole plant

	liquid single kg N/ha				liquid split kg N/ha			
	45	90	135	180	45	90	135	180
BANDUNG	62	69	73	84	70	79	82	93
GARUT	66	72	85	96	69	76	87	99

	briquet single kg N/ha				briquet split kg N/ha			
	45	90	135	180	45	90	135	180
BANDUNG	79	103	111	121	75	85	112	126
GARUT	71	82	89	108	73	88	109	129

code: MAKARIM
location: INDONESIA
data source: A.K. Makarim
year: 1989-1990 rainy season
variety: IR 64
application: 0,50,100,150 kgN/ha
tratment: ---
time: harvest at 115 DAT
21 days befor transplanting

WEIGHTS PLANT ORGANS (KG/HA)
organs: leaf, stem, root, grain

	0 kg N/ha				50 kg N/ha			
time	leaf	stem	root	grain	leaf	stem	root	grain
10	22	21			27	23		
20	116	119			118	117		
30	354	389	77		438	497	104	
40	722	861			1144	1256		
50	1406	2234			2099	2668		
60	1604	3446			2083	3910		
70	1774	4468	401		2227	5193	430	
115		4502		2976		5562		3880

	100 kg N/ha				150 kg N/ha			
time	leaf	stem	root	grain	leaf	stem	root	grain
10	30	27			39	36		
20	160	158			158	162		
30	482	565	118		577	538	98	
40	1407	1561			1587	1583		
50	2194	3036			2407	3168		
60	2371	4335			3050	4161		
70	2708	5250	425		3253	5289	471	
115		6400		4935		6833		5582

note: the dry matter weight of stem at day 115 is a combination of leaf and stem

organ: whole plant (=sum leaf + stem +(grain))

	kg N/ha			
time	0	50	100	150
10	43	50	58	75
20	235	235	318	320
30	743	935	1048	1115
40	1583	2400	2968	3170
50	3640	4768	5230	5575
60	5050	5993	6706	7211
70	6243	7420	7958	8542
115	7478	9442	11335	12415

N CONTENT (%) PLANT ORGANS

organs: whole plant no data available for grain only

	kg N/ha			
time	0	50	100	150
10	2	2	2	2
20	3	3	3	3
30	2	3	3	3
40	2	2	3	3
50	1	2	2	2
60	1	1	2	2
70	1	1	1	1
115	1	1	1	1

N-UPTAKE PLANT ORGANS (KG/HA)

organs: whole plant

	kg N/ha			
time	0	50	100	150
10	1	1	1	2
20	6	6	9	8
30	18	18	27	30
40	31	55	74	87
50	53	81	98	115
60	54	88	109	120
70	63	98	113	125
115	65	100	125	151

ZHANG.XLS

code: ZHA
location: CNRRI, HANGZHOU, CHINA
data source: Zhang Xiufu
year: april-july 1988
variety: variable
application: 0,75,150,225,300 kg N/ha
time: DATEB: 126 for Zhong 156 (1988-1989); 210 for H129

harvest: days after transplanting

	kg N/ha				
treatment	0	75	150	225	300
Zhong-156, 88	72	73	74	75	75
Zhong-156, 89	74	75	76	78	78
H129	84	86	89	89	89

data below not from paper workshop

WEIGHTS PLANT ORGANS (KG/HA)
organs: (leaf+stem), grain

	0 kg N/ha		75 kg N/ha		150 kg N/ha		225 kg N/ha		300 kg N/ha	
variety	leaf+stem	grain	leaf+stem	grain	leaf+stem	grain	leaf+stem	grain	leaf+stem	grain
Zhong-156, 88	8849	4531	10208	5226	10973	5596	11397	5619	11085	5232
Zhong-156, 89	8940	4604	10250	5248	11582	5918	11583	5745	11150	5240
H129	10011	5686	11283	6341	12442	6930	12960	7115	13285	7055

3.1 ROOT : SHOOT RATIO

ROOT : SHOOT RATIO VERSUS TIME (RS)

code: BUD
calculation: *ratio=root DM/(leaf DM + stem DM)*

variety: IET 9276

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.22	0.22	0.22
33	0.17	0.20	0.22
53	0.15	0.16	0.14
63	0.21	0.15	0.09
87	0.17	0.15	0.17

chart: RSBUD1.XLC

variety: IET 9572

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.22	0.22	0.22
33	0.22	0.22	0.25
53	0.15	0.17	0.15
63	0.15	0.13	0.13
87	0.18	0.19	0.16

chart: RSBUD2.XLC

variety: IET 8362

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.19	0.19	0.19
33	0.24	0.22	0.21
53	0.17	0.16	0.14
63	0.15	0.14	0.12
87	0.15	0.19	0.14

chart: RSBUD3.XLC

variety: IR 20

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.28	0.28	0.28
33	0.22	0.24	0.21
53	0.17	0.18	0.24
63	0.15	0.14	0.16
87	0.18	0.28	0.17

chart: RSBUD4.XLC

variety: ADT 38

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.21	0.21	0.21
33	0.26	0.24	0.22
53	0.18	0.17	0.19
63	0.15	0.17	0.15
87	0.19	0.19	0.16

chart: RSBUD5.XLC

code: RAO
calculation: ratio= root/(leaf +stem +grain)

time	0 kg N/ha	50 kg N/ha	100 kg N/ha	150 kg N/ha
38	0.55	0.55	0.55	0.55
58	0.41	0.42	0.43	0.47
68	0.27	0.39	0.30	0.30
78	0.29	0.28	0.26	0.26
98	0.18	0.21	0.20	0.22
108	0.08	0.11	0.11	0.09
130	0.07	0.08	0.08	0.07

chart: RSRAO.XLC

code: TMT
calculation: ratio = root / (leaf + stem+ panicle)

time	0 kg N/ha	100 kg N/ha	200 kg N/ha	300 kg N/ha	400 kg N/ha
0	0.22	0.22	0.22	0.22	0.22
18	0.37	0.41	0.50	0.41	0.38
25	0.28	0.28	0.26	0.26	0.25
32	0.20	0.21	0.20	0.21	0.20
39	0.17	0.19	0.18	0.19	0.17
46	0.15	0.17	0.15	0.18	0.18
53	0.14	0.15	0.15	0.17	0.17
63	0.12	0.11	0.12	0.14	0.15
81	0.10	0.08	0.08	0.11	0.13
89	0.09	0.08			
94			0.08	0.12	
97					0.14

chart: RSTMT.XLC

code: MAKARIM
calculation: ratio = root /(leaf + stem+ grain)

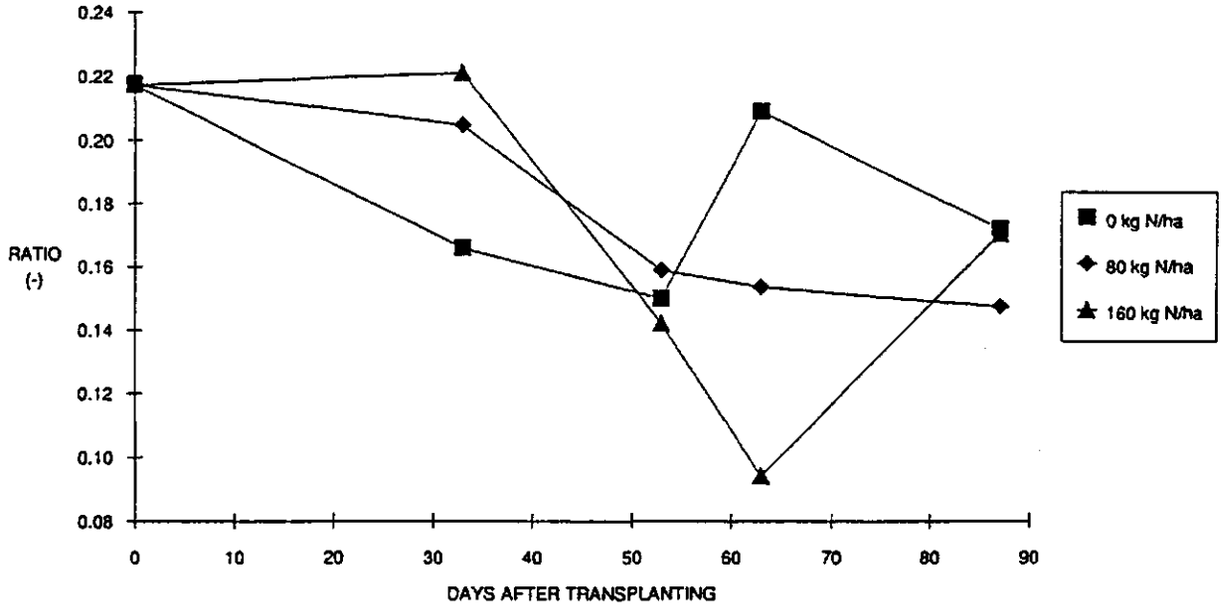
time	0 kg N/ha	50 kg N/ha	100 kg N/ha	150 kg N/ha
30	0.10	0.11	0.11	0.09
70	0.06	0.06	0.05	0.06

chart: RSMAK.XLC

RSBUD1.XLC

ROOT : SHOOT RATIO

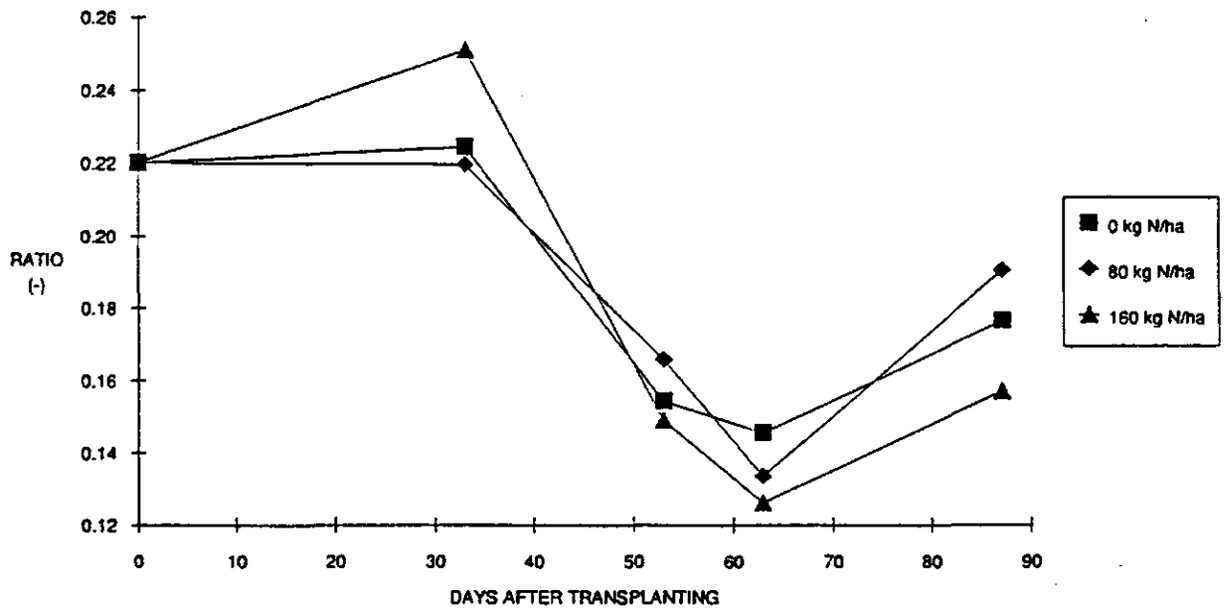
BUD; Tamil Nadu, India; variety: IET 9276



RSBUD2.XLC

ROOT : SHOOT RATIO

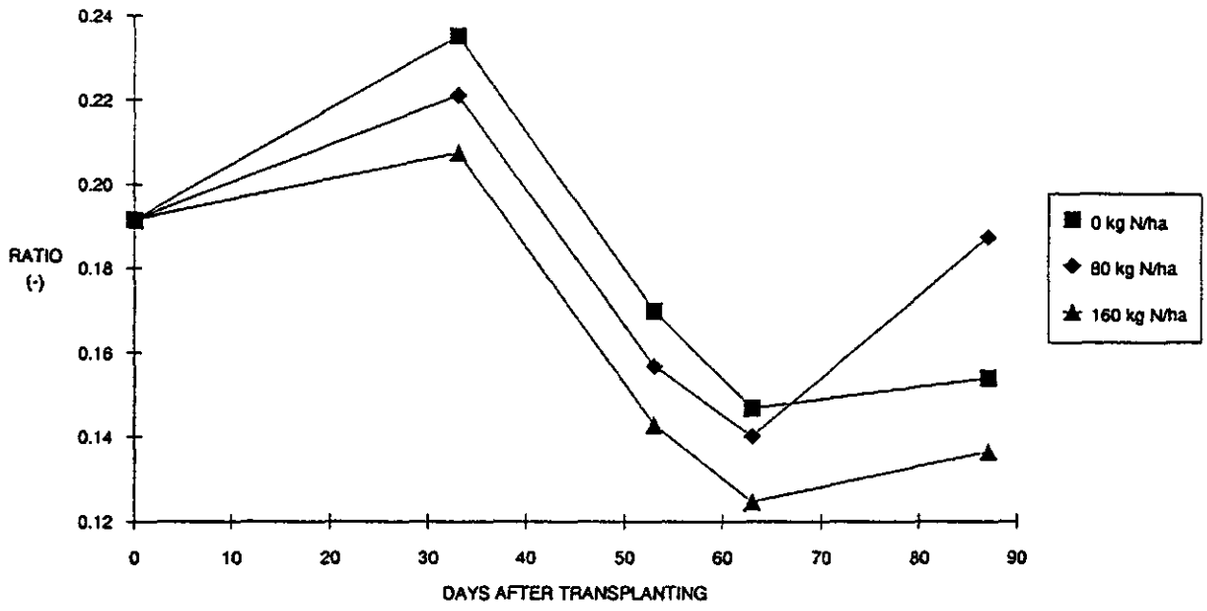
BUD; Tamil Nadu, India; variety: IET 9572



RSBUD3.XLC

ROOT : SHOOT RATIO

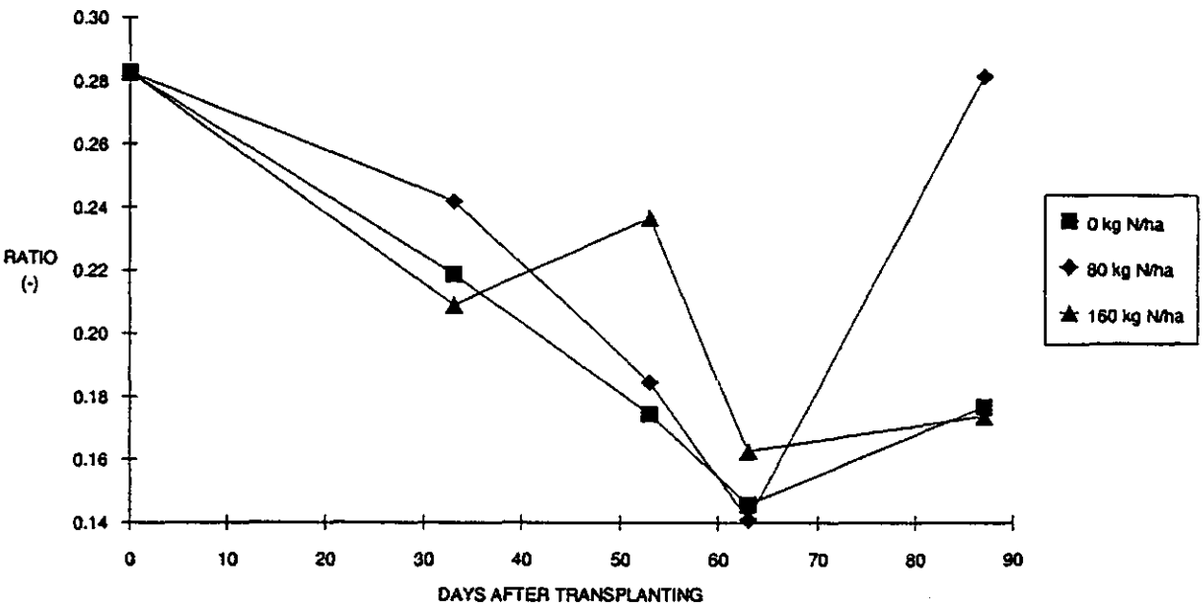
BUD; Tamil Nadu, India; variety: IET 8362



RSBUD4.XLC

ROOT : SHOOT RATIO

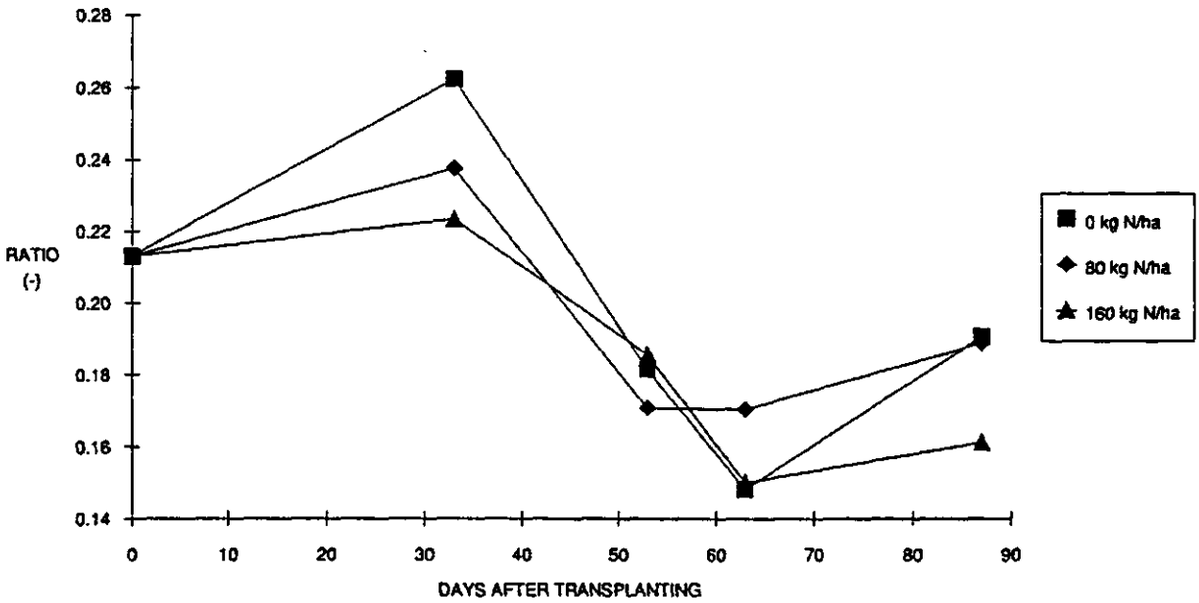
BUD; Tamil Nadu, India; variety: IR 20



RSBUD5.XLC

ROOT : SHOOT RATIO

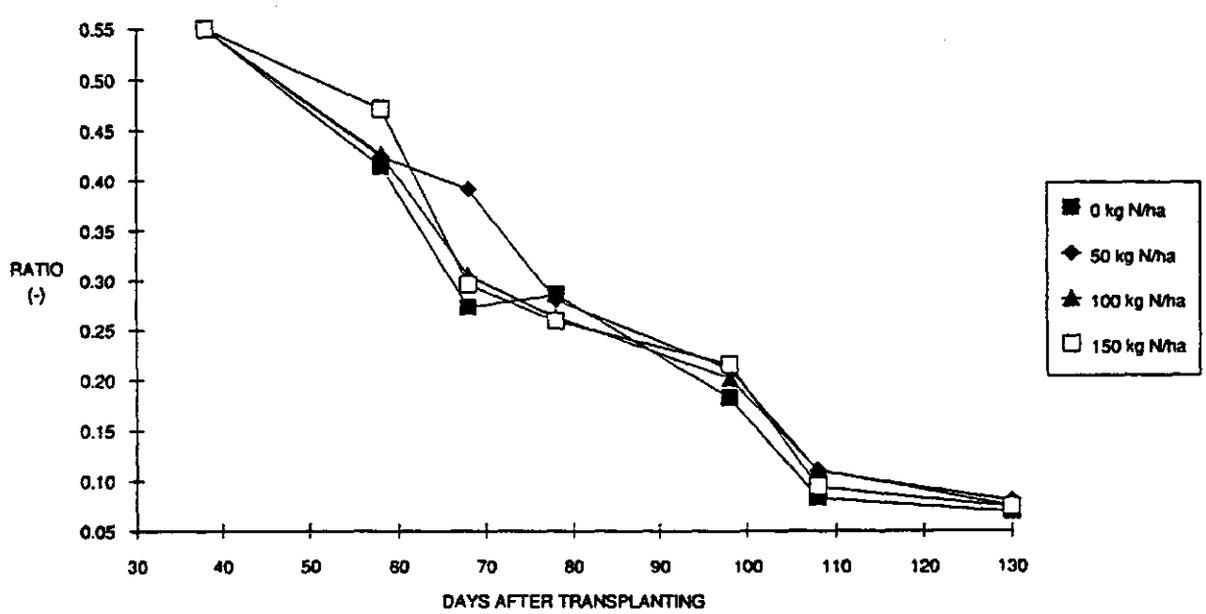
BUD; Tamil Nadu, India; variety: ADT 38



RSRAO.XLC

ROOT : SHOOT RATIO

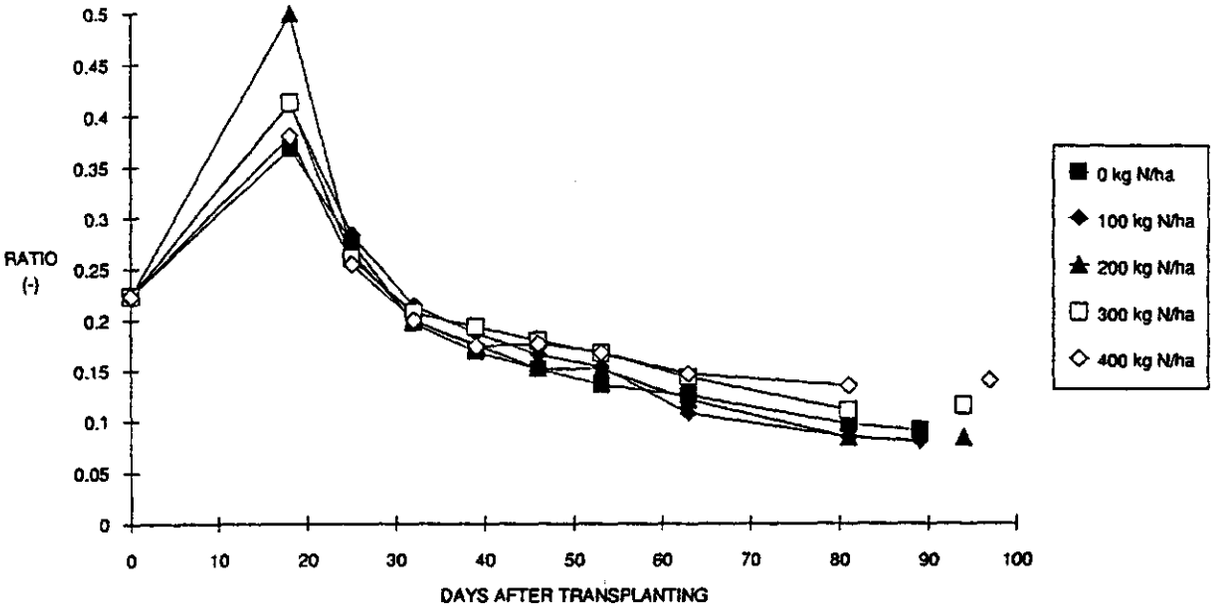
RAO; Cuttack, India; variety: IR 60



RSTMT.XLC

ROOT : SHOOT RATIO

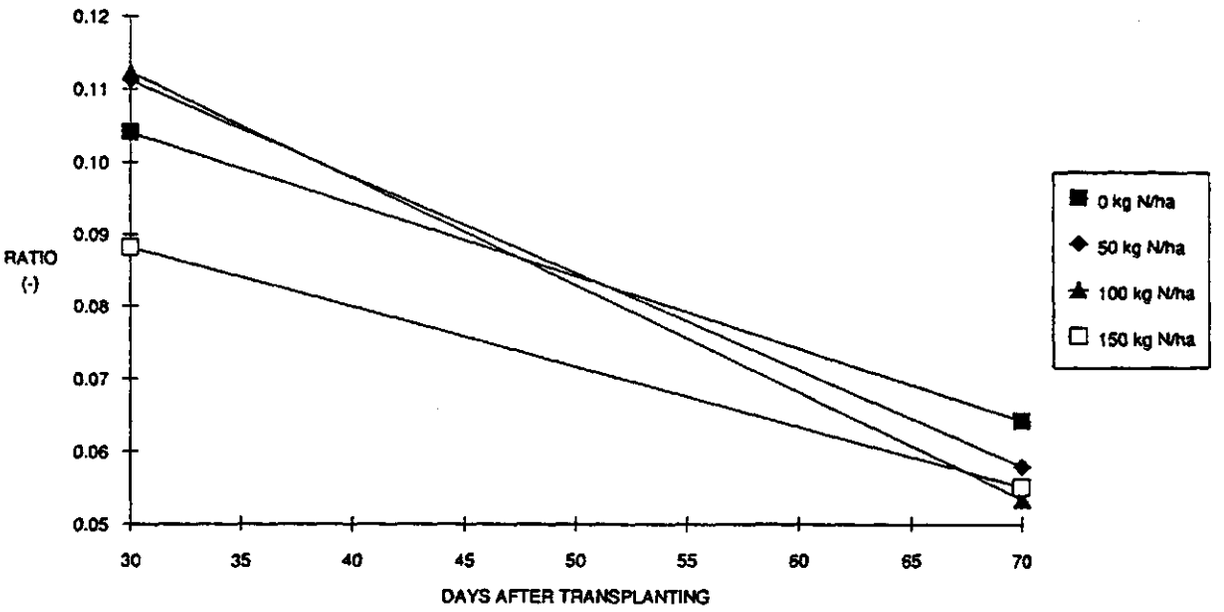
TMT; Tamil Nadu, India; variety: ADT 39



RSMAK.XLC

ROOT : SHOOT RATIO

MAK; Bogor, Indonesia; variety: IR 64



LEAF : STEM RATIO VERSUS TIME (LS)

code: BUD
calculation: ratio = leaf DM / stem DM

variety: IET 9276

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	1.11	1.11	1.11
33	0.97	0.96	0.95
53	0.39	0.65	0.45
63	0.58	0.66	0.94
87	0.35	0.35	0.38

chart: LSBUD1.XLC

variety: IET 9572

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	1.09	1.09	1.09
33	0.90	0.94	1.05
53	0.54	0.63	0.68
63	0.27	0.30	0.33
87	0.37	0.39	0.44

chart: LSBUD2.XLC

variety: IET 8362

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.95	0.95	0.95
33	0.84	0.88	0.91
53	0.50	0.63	0.60
63	0.45	0.58	0.46
87	0.50	0.63	0.45

chart: LSBUD3.XLC

variety: IR 20

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.77	0.77	0.77
33	0.94	0.87	0.95
53	0.54	0.71	0.86
63	0.31	0.27	0.32
87	0.42	0.40	0.49

chart: LSBUD4.XLC

variety: ADT 38

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	1.01	1.01	1.01
33	0.84	0.93	0.97
53	0.53	0.60	0.78
63	0.34	0.44	0.50
87	0.42	0.48	0.47

chart: LSBUD5.XLC

code: RAO
calculation: ratio = leaf DM / stem DM

time	0 kg N/ha	50 kg N/ha	100 kg N/ha	150 kg N/ha
38	0.67	0.67	0.67	0.67
58	1.02	0.93	0.99	1.07
68	0.59	0.65	0.70	0.85
78	0.47	0.50	0.53	0.61
98	0.36	0.39	0.39	0.45
108	0.14	0.16	0.18	0.19
130	0.35	0.35	0.36	0.45

chart: LSRAO.XLC

code: TMT
calculation: ratio = leaf DM / stem DM

time	0 kg N/ha	100 kg N/ha	200 kg N/ha	300 kg N/ha	400 kg N/ha
0	0.81	0.81	0.81	0.81	0.81
18	1.47	1.32	1.29	1.12	1.10
25	1.52	1.43	1.12	1.11	1.12
32	1.63	1.63	1.42	1.15	1.06
39	2.02	1.80	1.68	1.21	1.16
46	2.24	2.05	1.87	1.34	1.15
53	2.81	2.40	2.13	1.58	1.22
63	2.55	2.55	1.93	1.56	1.18
81	2.38	2.20	1.80	1.37	1.17
89	2.11	1.99			
94			2.00	1.36	
97					1.42

chart: LSTMT.XLC

code: MAKARIM
calculation: ratio = leaf DM / stem DM

time	0 kg N/ha	50 kg N/ha	100 kg N/ha	150 kg N/ha
10	1.07	1.15	1.12	1.08
20	0.98	1.01	1.01	0.97
30	0.91	0.88	0.85	1.07
40	0.84	0.91	0.90	1.00
50	0.63	0.79	0.72	0.76
60	0.47	0.53	0.55	0.73
70	0.40	0.43	0.52	0.62

chart: LSMAK.XLC

code: MHD
calculation: ratio = leaf DM / (total DM - leaf DM)

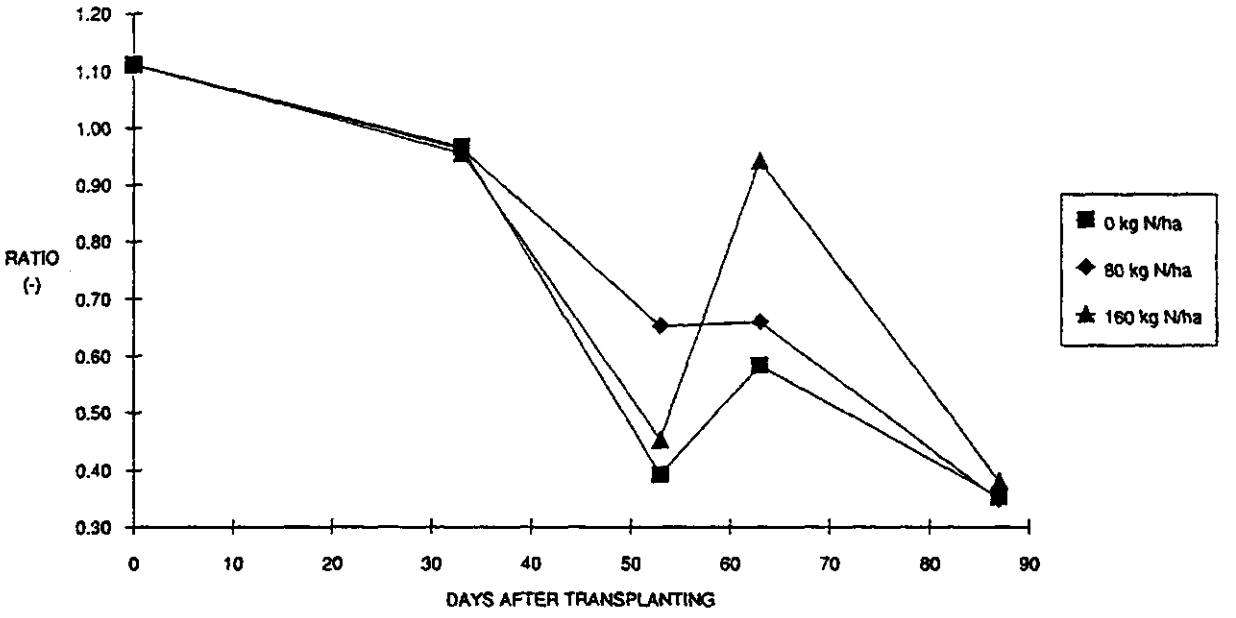
time	150 kg N/ha; June 30	time	100 kg N/ha; July 26
0	0.94	0	0.91
10	1.43	13	1.03
24	1.49	20	1.26
39	0.73	30	0.63
45	0.82	40	0.52
49	0.75	50	0.30
52	0.61	55	
59	0.42	64	0.16
66	0.30	78	0.11
73	0.26		
80	0.23		
83	0.21		

chart: LSMHD.XLC

LSBUD1.XLC

LEAF : STEM RATIO

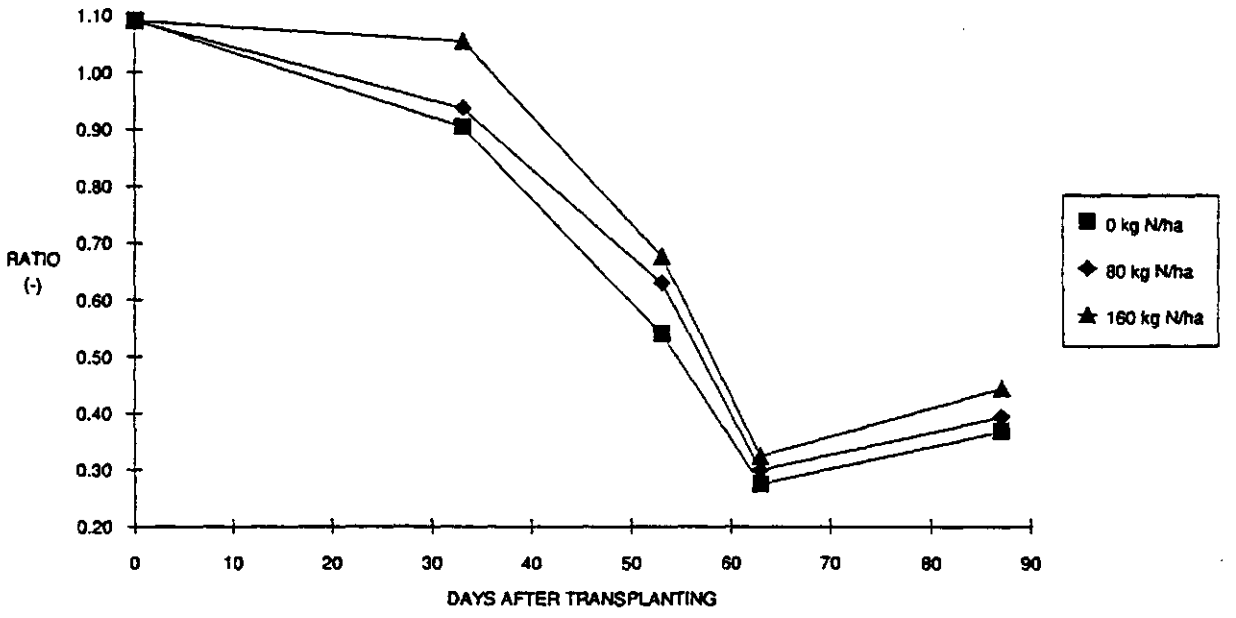
BUD, Tamil Nadu, India; variety: IET 9276



LSBUD2.XLC

LEAF : STEM RATIO

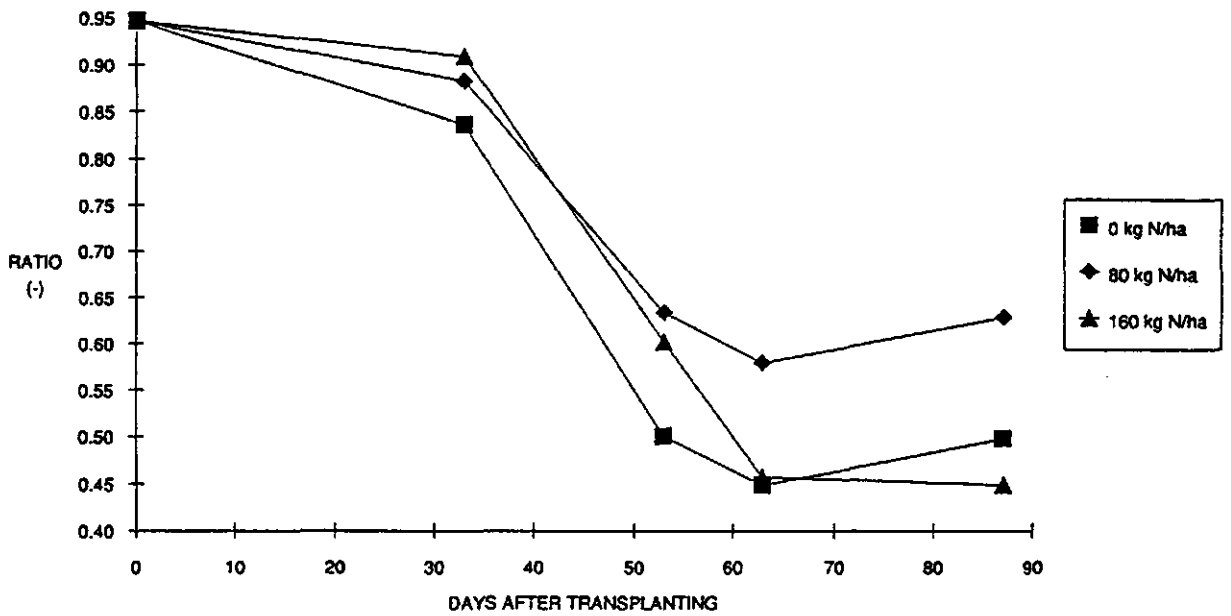
BUD, Tamil Nadu, India; variety: IET 9572



LSBUD3.XLC

LEAF : STEM RATIO

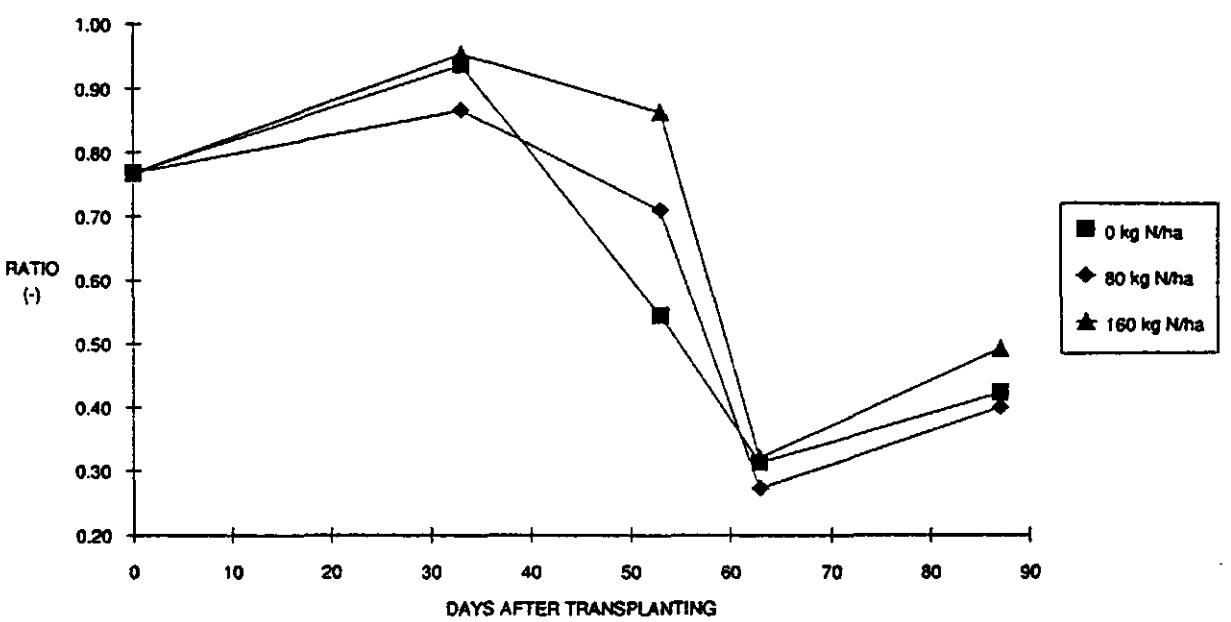
BUD, Tamil Nadu, India; variety: IET 8362



LSBUD4.XLC

LEAF : STEM RATIO

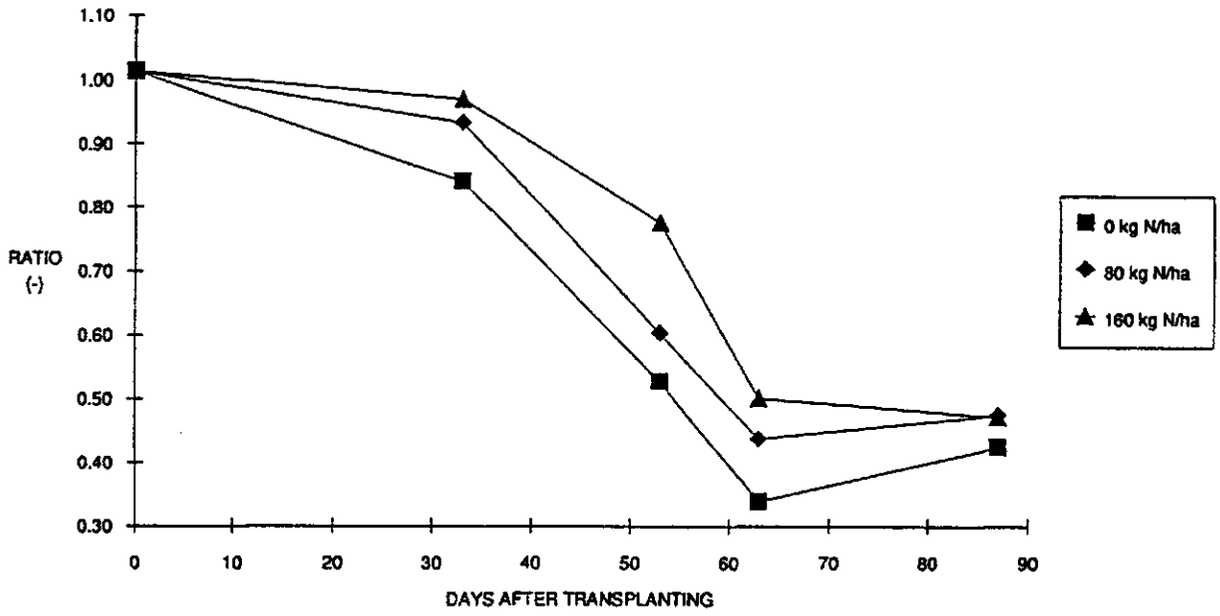
BUD, Tamil Nadu, India; variety: IR 20



LSBUD5.XLC

LEAF : STEM RATIO

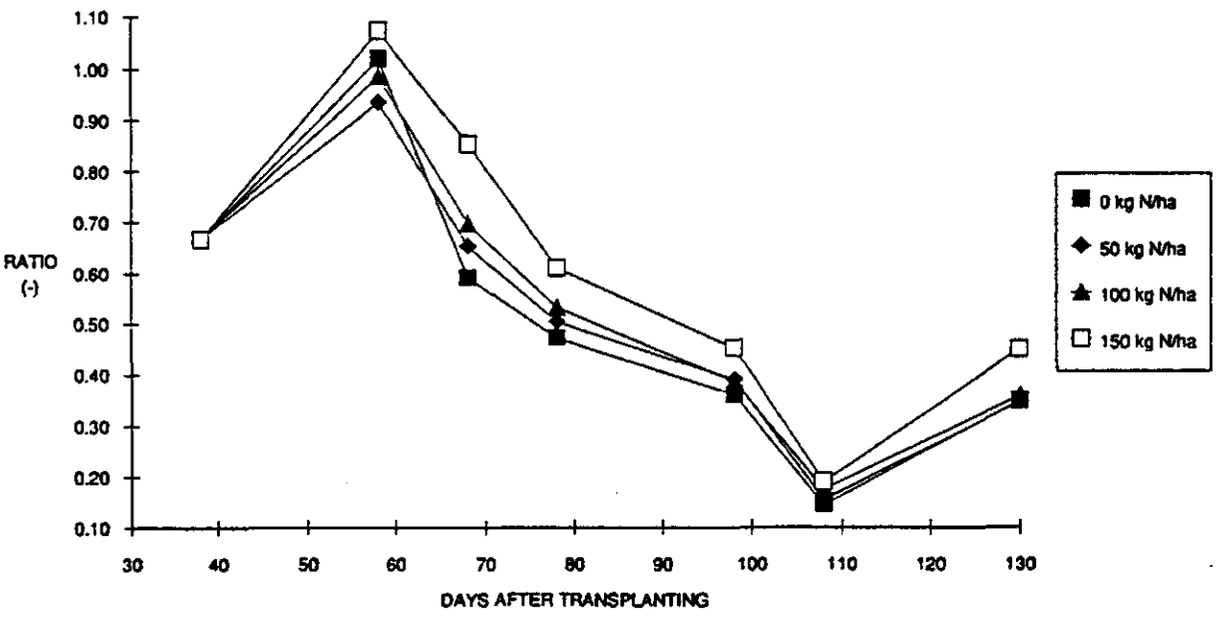
BUD, Tamil Nadu, India; variety: ADT 38



LSRAO.XLC

LEAF : STEM RATIO

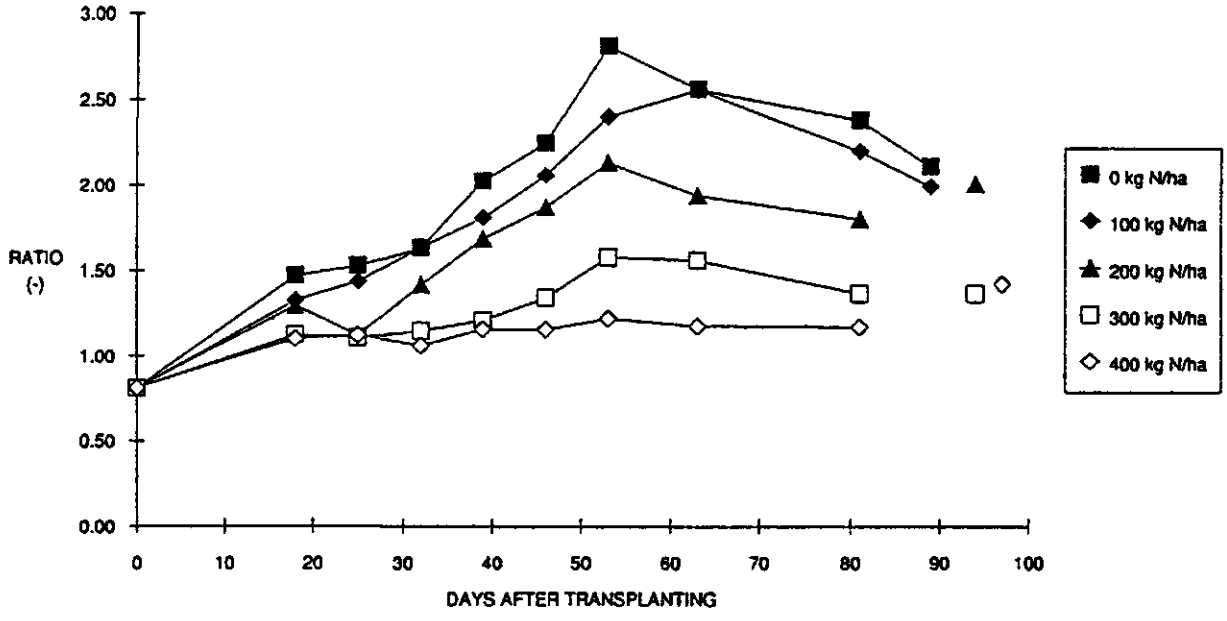
RAO; Cuttack, India; variety: IR 60



LSTMT.XLC

LEAF : STEM RATIO

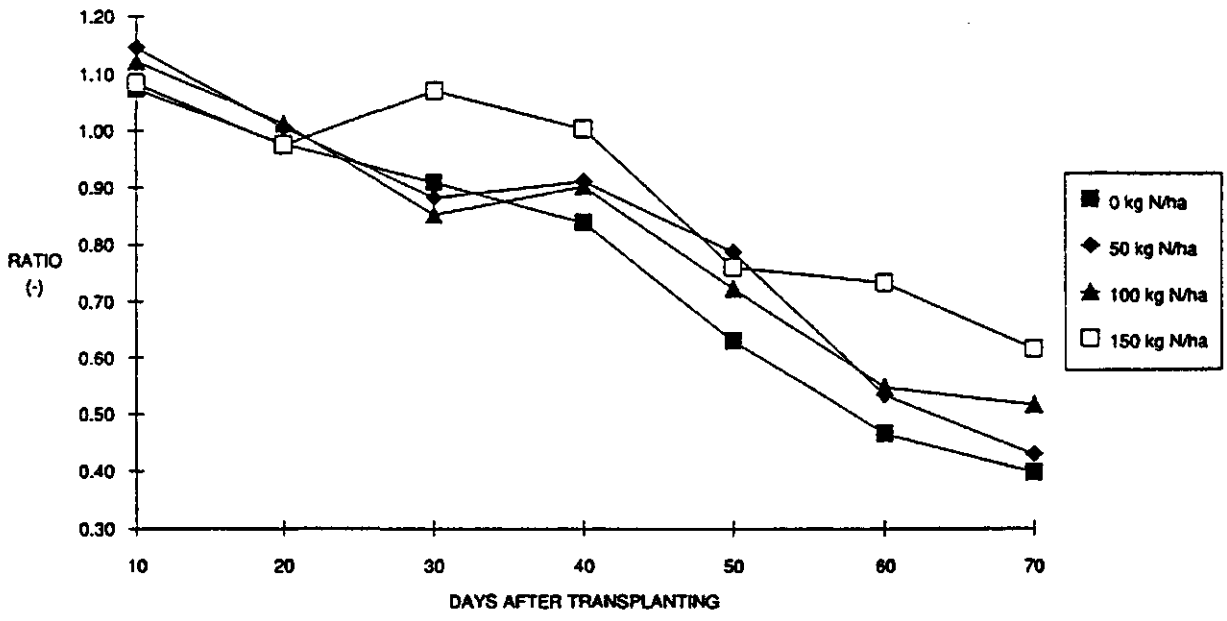
TMT; Tamil Nadu, India; variety: ADT 39



LSMAK.XLC

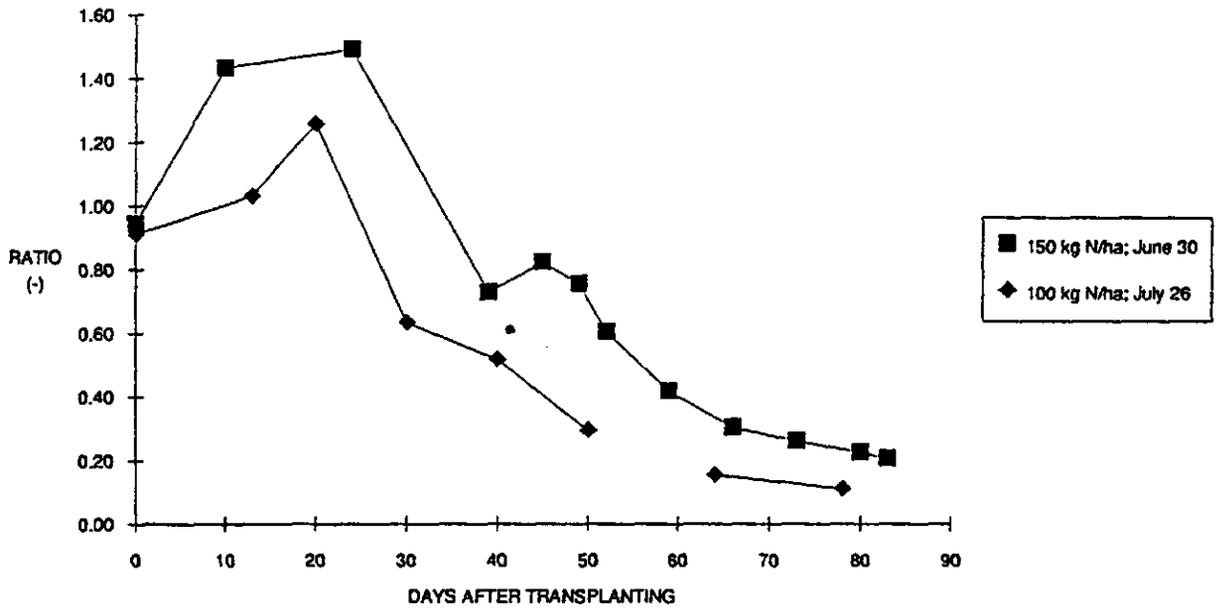
LEAF : STEM RATIO

MAK; Bogor, Indonesia; variety: IR 64



LEAF : STEM RATIO

MHD; Tamil Nadu, India; variety: IR 50; two planting dates



3.3 ROOT MASS

ROOT MASS ABSOLUTE (KG/HA; RT)

code: BUD
calculation: *root DM*

variety: IET 9276

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	33	33	33
33	279	376	421
53	586	753	814
63	677	882	908
87	792	735	1067

chart: RTBUD1.XLC

variety: IET 9572

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	46	46	46
33	301	329	367
53	592	912	917
63	1174	1372	1488
87	937	1052	1167

chart: RTBUD2.XLC

variety: IET 8362

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	63	63	63
33	372	385	425
53	537	542	666
63	870	992	919
87	603	933	710

chart: RTBUD3.XLC

variety: IR 20

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	28	28	28
33	318	387	411
53	616	645	1029
63	1292	1511	1821
87	727	1357	934

chart: RTBUD4.XLC

RTABS.XLS

variety: ADT 38

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	33	33	33
33	362	367	372
53	670	770	891
63	945	1116	1077
87	667	822	1092

chart: RTBUD5.XLC

code: RAO
calculation: root DM

time	0 kg N/ha	50 kg N/ha	100 kg N/ha	150 kg N/ha
38	44	44	44	44
58	223	237	286	333
68	323	523	539	561
78	605	743	979	1078
98	602	905	1116	1317
108	500	861	952	932
130	500	820	858	899

chart: RTRAO.XLC

code: TMT
calculation: root DM

time	0 kg N/ha	100 kg N/ha	200 kg N/ha	300 kg N/ha	400 kg N/ha
0	19	19	19	19	19
18	260	377	491	500	521
25	326	494	620	710	775
32	370	590	764	925	1030
39	421	672	880	1150	1250
46	463	734	930	1324	1525
53	482	848	1120	1502	1750
63	537	836	1183	1790	2003
81	530	836	997	1507	1968
89	530	836			
94			950	1507	
97					1968

chart: RTTMT.XLC

code: MAKARIM
calculation: root DM

time	0 kg N/ha	50 kg N/ha	100 kg N/ha	150 kg N/ha
30	77	104	118	98
70	401	430	425	471

chart: RTMAK.XLC

code: PANT
calculation: root DM

time	0 kg N/ha	60 kg N/ha	120 kg N/ha	180 kg N/ha	240 kg N/ha
25	317	353	414	479	515
45	638	745	1034	1276	1500
67	1016	1280	1554	1664	2041

chart: RTPANT.XLC

code: RAM
calculation: root DM

time	no drainage 100 kg N/ha;	150 kg N/ha;	200 kg N/ha; no drainage
30	407	412	423
40	937	953	983
50	1225	1277	1326
60	1381	1437	1544
70	1332	1471	1537
80	1235	1315	1401
90	93	109	113

chart: RTRAM.XLC

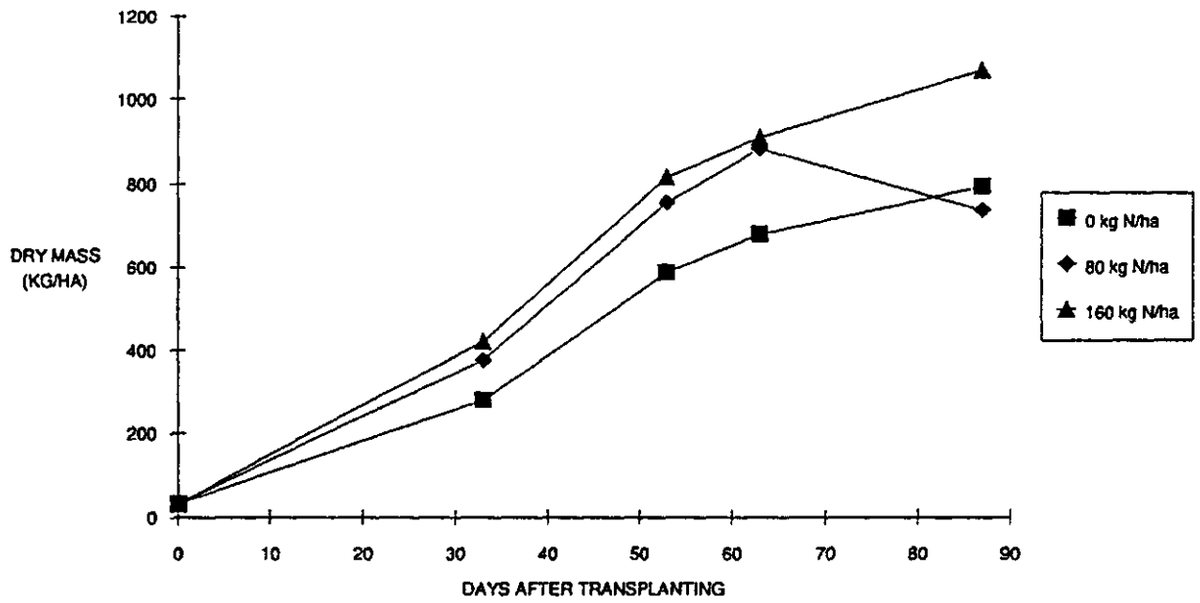
time	drainage 100 kg N/ha;	150 kg N/ha;	200 kg N/ha; drainage
30	420	432	441
40	939	957	993
50	1297	1383	1435
60	1426	1534	1586
70	1500	1535	1610
80	1403	1450	1467
90	121	126	127

NOTE: harvest date is not known but to create the graph a number is needed (here: 90)

RTBUD1.XLC

ROOT DRY MASS (KG/HA)

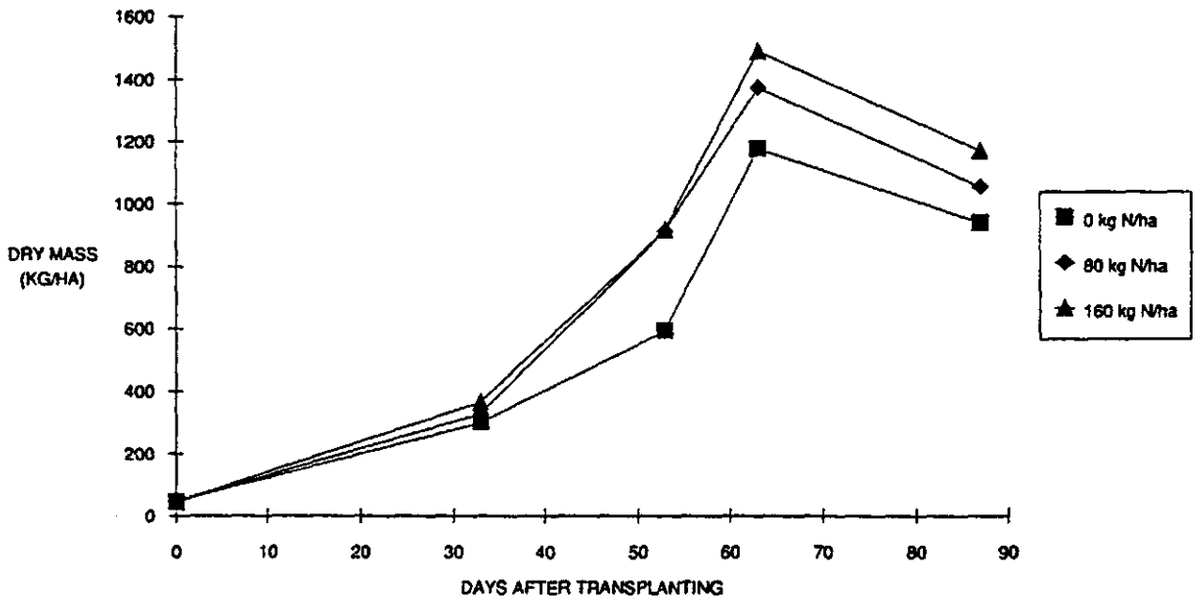
BUD, Tamil Nadu, India; variety: IET 9276



RTBUD2.XLC

ROOT DRY MASS (KG/HA)

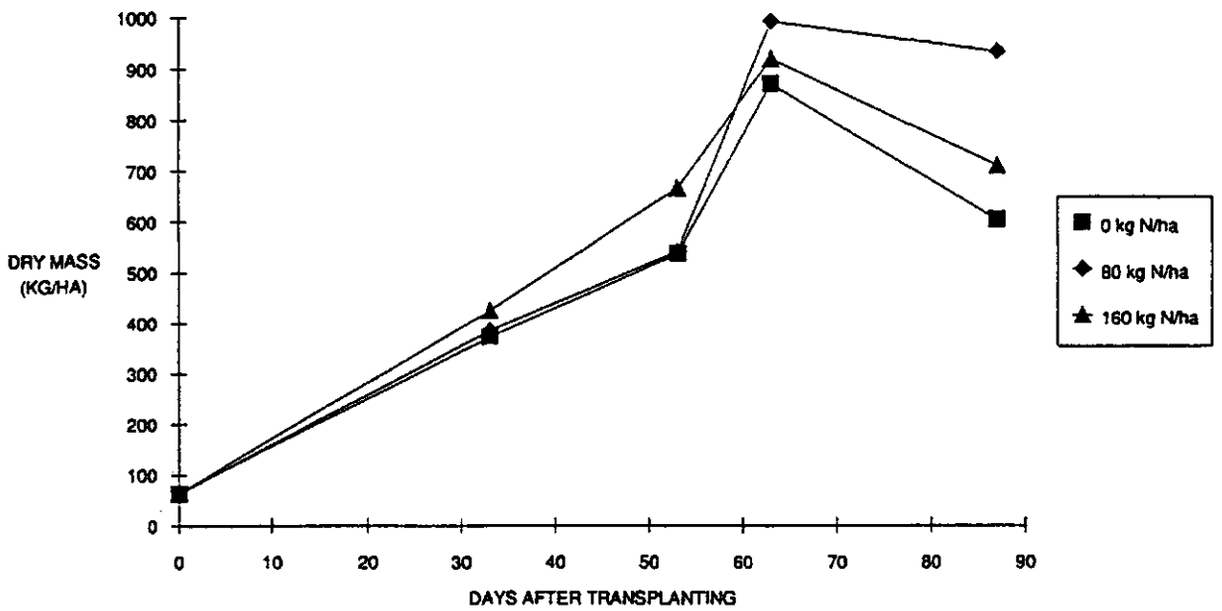
BUD, Tamil Nadu, India; variety: IET 9572



RTBUD3.XLC

ROOT DRY MASS (KG/HA)

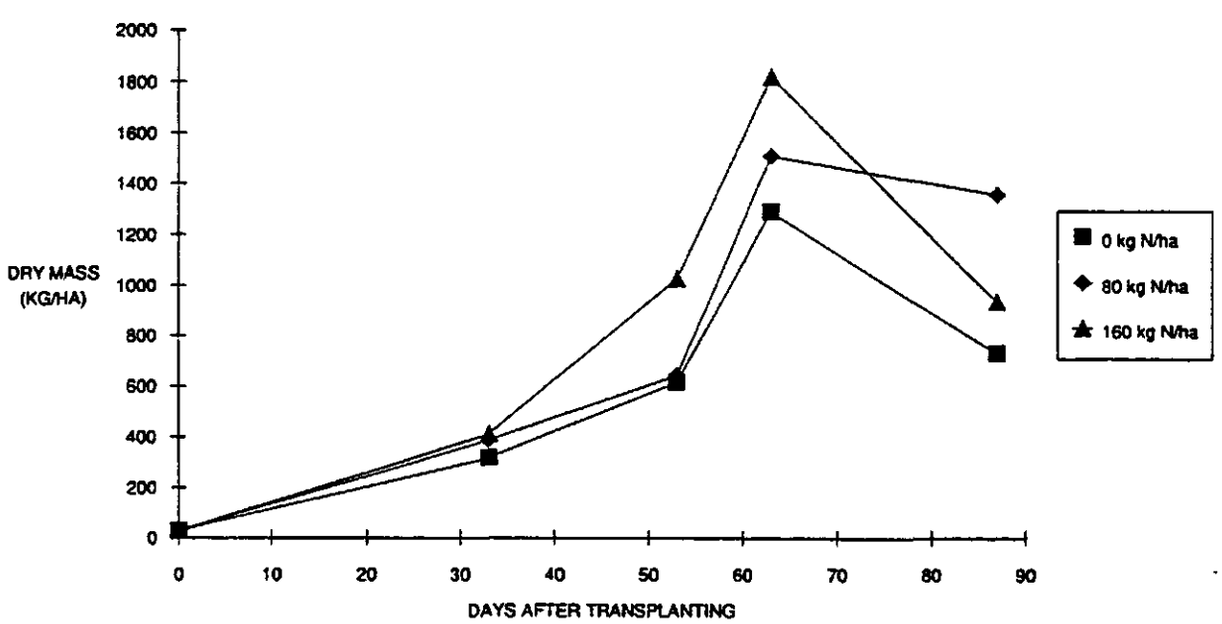
BUD, Tamil Nadu, India; variety: IET 8362



RTBUD4.XLC

ROOT DRY MASS (KG/HA)

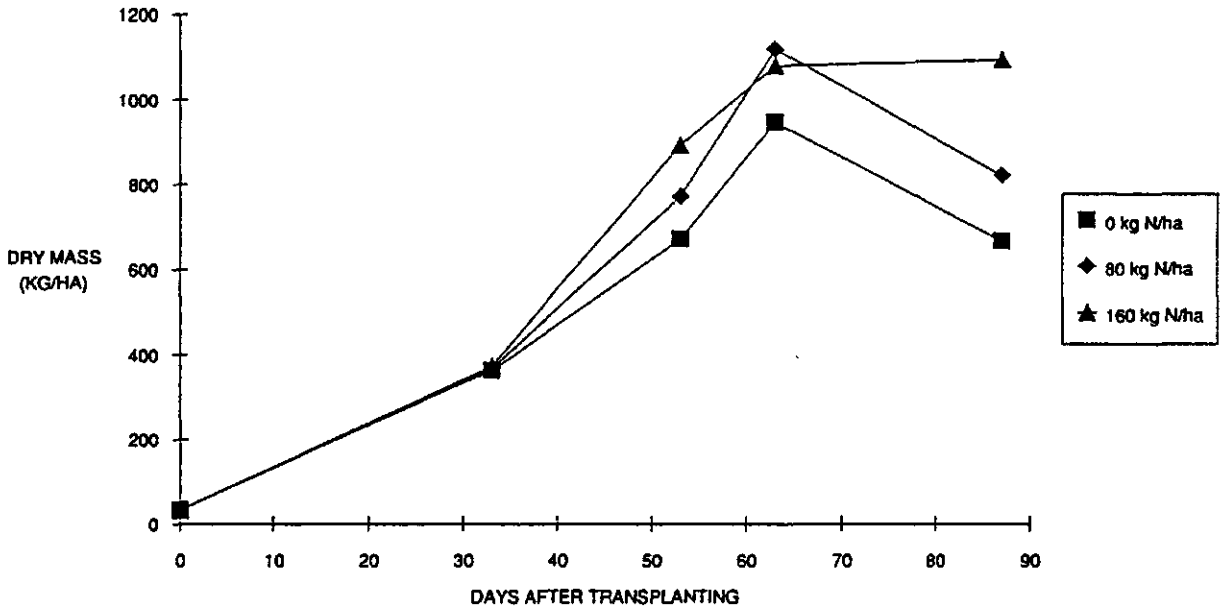
BUD, Tamil Nadu, India; variety: IR 20



RTBUD5.XLC

ROOT DRY MASS (KG/HA)

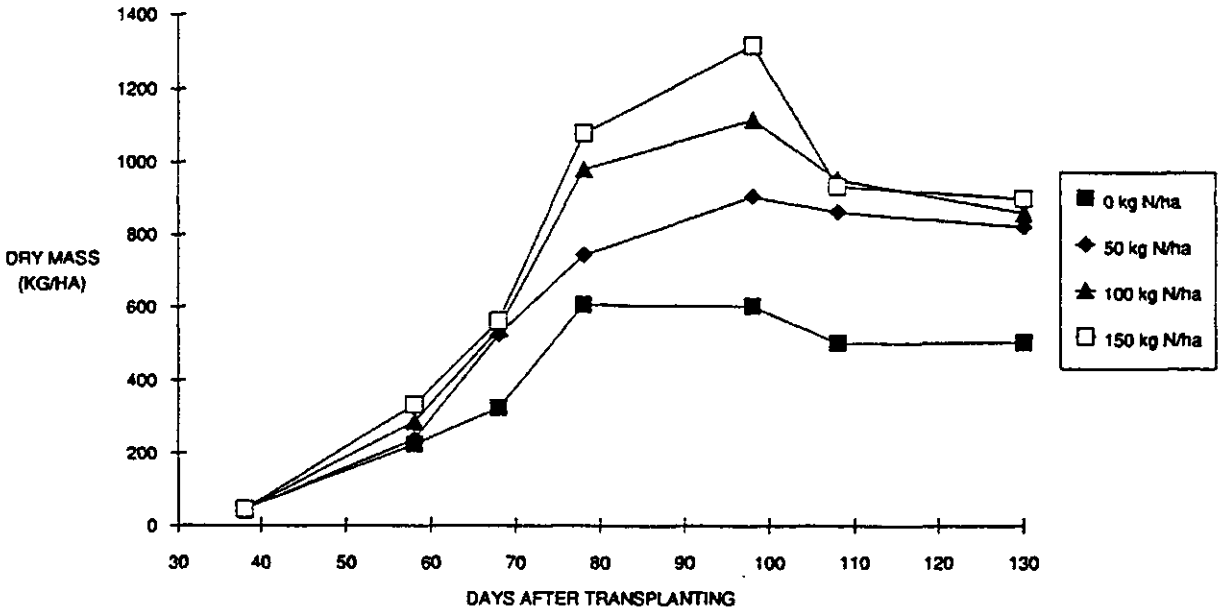
BUD, Tamil Nadu, India; variety: ADT 38



RTRAO.XLC

ROOT DRY MASS (KG/HA)

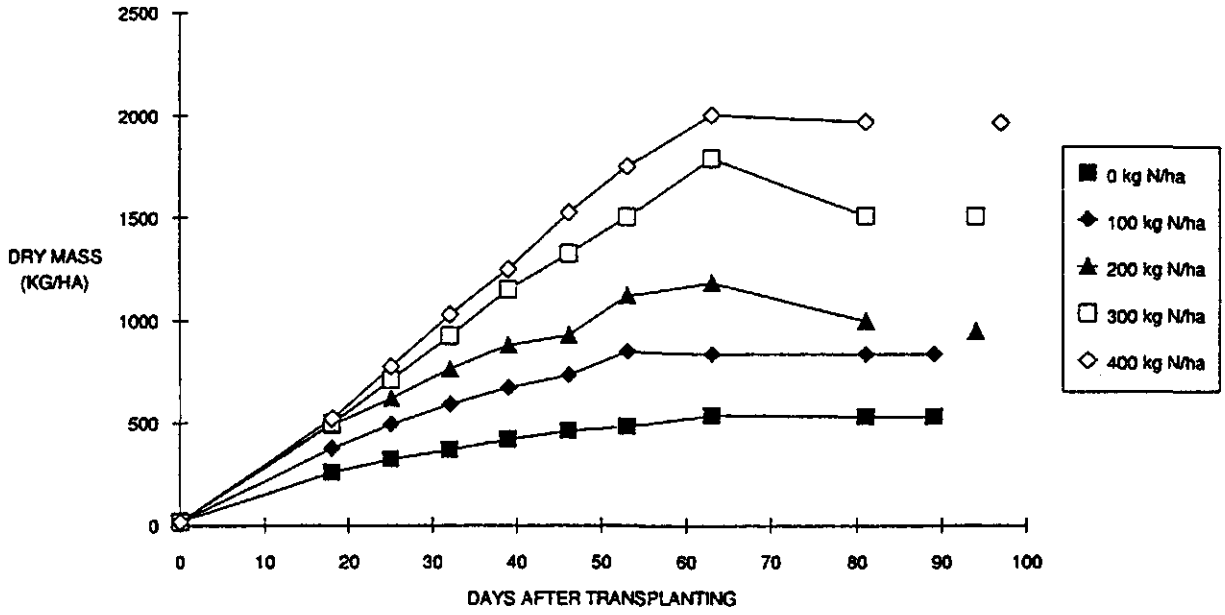
RAO; Cuttack, India; variety IR 60



RTTMT.XLC

ROOT DRY MASS (KG/HA)

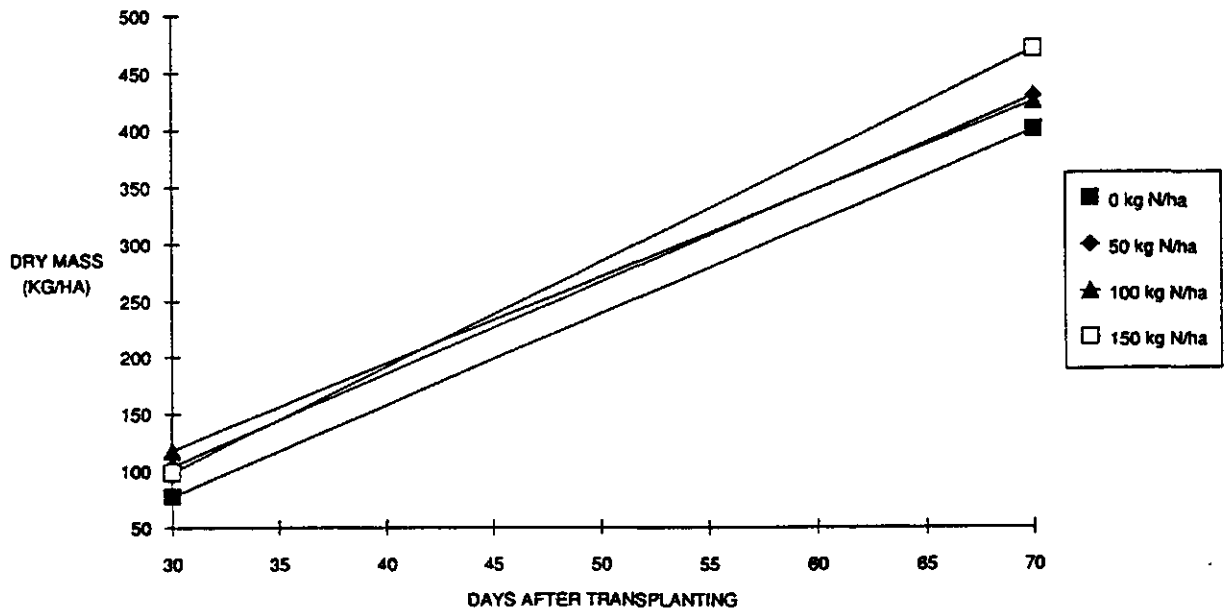
TMT; Tamil Nadu, India; variety: ADT 39



RTMAK.XLC

ROOT DRY MASS (KG/HA)

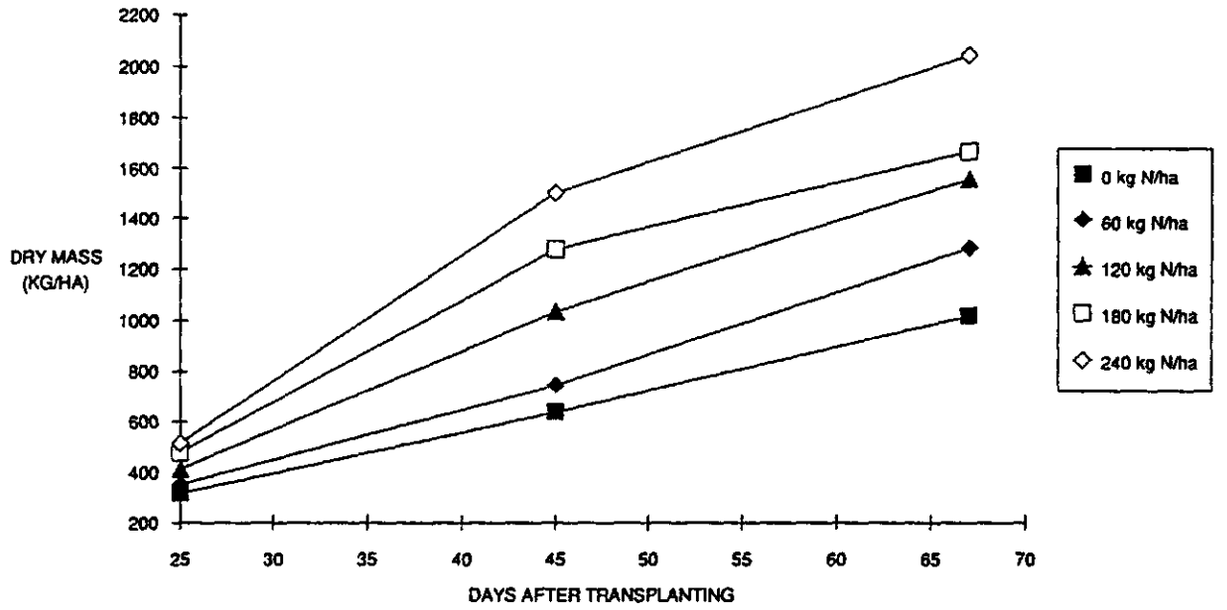
MAK; Bogor, Indonesia; variety: IR 64



RTPANT.XLC

ROOT DRY MASS (KG/HA)

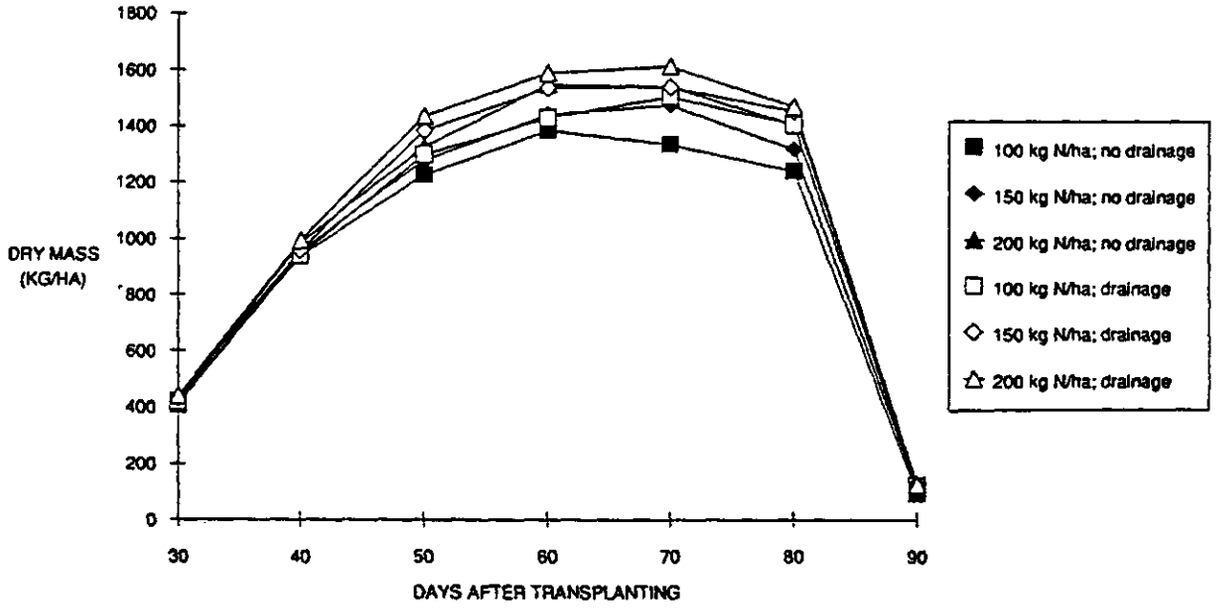
PANT; Pantnagar, India; variety: PD 4



RTRAM.XLC

ROOT DRY MASS (KG/HA)

RAM, Tamil Nadu, India; variety: IR 50



3.4 N (%) CONTENT LEAF

N (%) CONTENT LEAF (KG/HA; NL)

code: BUD
calculation: N-content leaf

variety: IET 9276

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	1.06	1.06	1.06
33	1.68	1.85	1.51
53	1.68	1.06	2.24
63	1.06	1.68	1.40
87	0.74	1.06	0.84

chart: NLBUD1.XLC

variety: IET 9572

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.80	0.80	0.80
33	1.23	1.46	1.51
53	1.96	2.02	2.07
63	0.62	0.67	1.34
87	0.84	0.67	1.18

chart: NLBUD2.XLC

variety: IET 8362

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	1.12	1.12	1.12
33	1.57	1.62	1.18
53	1.85	1.85	1.18
63	0.84	1.12	1.57
87	0.67	1.12	0.78

chart: NLBUD3.XLC

variety: IR 20

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.67	0.67	0.67
33	1.29	1.01	1.57
53	0.39	1.29	1.85
63	1.06	0.95	0.84
87	0.50	0.56	0.78

chart: NLBUD4.XLC

NLEAF.XLS

variety: ADT 38

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.67	0.67	0.67
33	1.46	1.34	2.19
53	1.62	1.96	1.90
63	1.12	1.50	2.02
87	1.29	1.23	1.29

chart: NLBUD5.XLC

code: RAO
calculation: N-content leaf

time	0 kg N/ha	50 kg N/ha	100 kg N/ha	150 kg N/ha
0	2.18	2.18	2.18	2.18
38	1.89	1.60	1.82	1.82
98	1.31	1.31	1.64	1.79
108	0.91	1.02	1.10	1.13
118	0.69	0.62	0.69	0.91

chart: NLRAO.XLC

code: TMT
calculation: N-content leaf

time	0 kg N/ha	100 kg N/ha	200 kg N/ha	300 kg N/ha	400 kg N/ha
0	1.68	1.68	1.68	1.68	1.68
18	1.38	1.76	1.9	2.21	2.41
25	0.83	1.52	1.97	2.34	2.67
32	0.97	1.24	1.38	1.79	2.07
39	1.03	1.03	1.24	1.65	1.76
46	0.94	1.13	1.25	1.57	1.62
53	0.99	1.15	1.24	1.31	1.6
63	0.64	0.84	1.24	1.31	1.48
81	0.53	0.69	1.03	1.11	1.29
89	0.48	0.53			
94			0.62	0.8	
97					1.06

chart: NLTMT.XLC

code: MHD
calculation: N-content leaf

planting date: June 30

time	150 kg N/ha;	100 kg N/ha; June 30
0	5.77	5.77
12	6.11	5.83
24	6.79	6.20
39	6.58	5.85
45	6.02	5.55
52	6.55	5.93
59	5.95	5.26
66	5.27	4.92
73	4.47	3.55
80	4.02	
81		3.78
83	3.89	

time	100 kg N/ha; June 30
0	5.77
12	5.83
24	6.20
39	5.85
45	5.55
52	5.93
59	5.26
66	4.92
73	3.55
80	
81	3.78
83	

chart:
NLMHD1.XLC
NLMHD2.XLC
NLMHD3.XLC

planting date: July 11

time	150 kg N/ha;	100 kg N/ha; July 11
0	5.45	5.45
9	5.11	5.57
24	5.79	5.32
30	5.99	5.50
37	5.89	4.91
51	6.01	4.42
58	4.97	4.04
65	4.06	3.02
72	3.70	2.54
79		2.03
82	3.00	

planting date: July 11

time	100 kg N/ha; July 11
0	5.45
9	5.57
24	5.32
30	5.5
37	4.91
51	4.42
58	4.04
65	3.02
72	2.54
79	2.03
82	

planting date: July 26

time	150 kg N/ha;	100 kg N/ha; July 26
0	5.32	5.32
13	5.50	5.21
20	5.00	4.87
30	5.50	5.09
40	4.86	4.07
50	5.23	3.77
55	4.52	2.09
64	3.74	1.88
74	2.42	1.65
79		1.50
81	2.05	

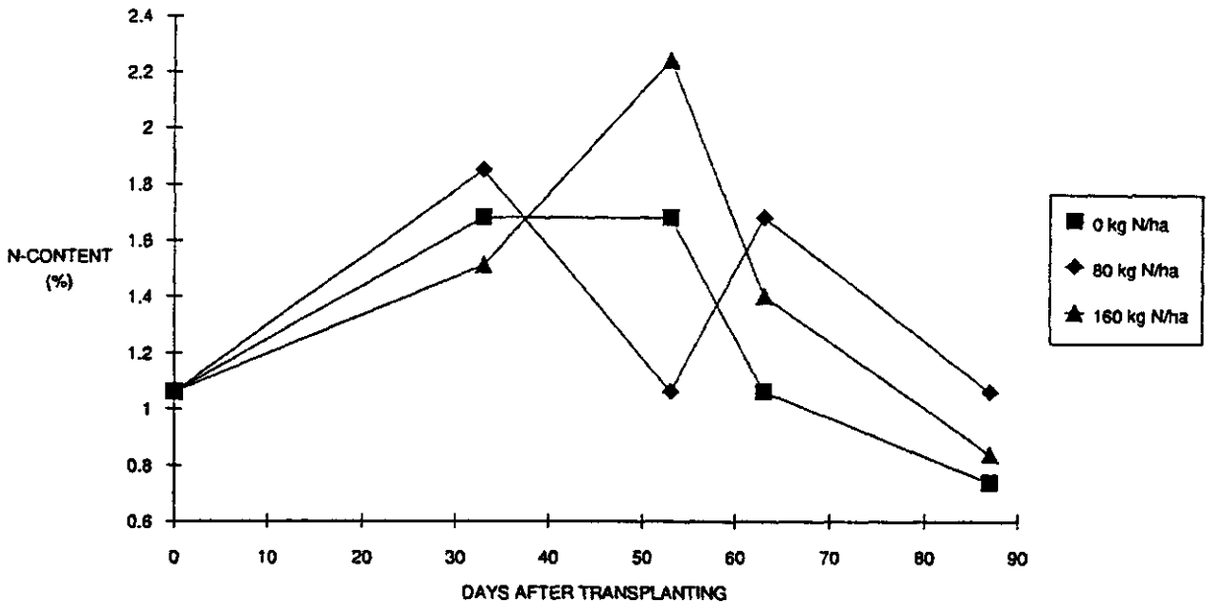
planting date: July 26

time	100 kg N/ha; July 26
0	5.32
13	5.21
20	4.87
30	5.09
40	4.07
50	3.77
55	2.09
64	1.88
74	1.65
79	1.50
81	

NLBUD1.XLC

N (%) CONTENT LEAF

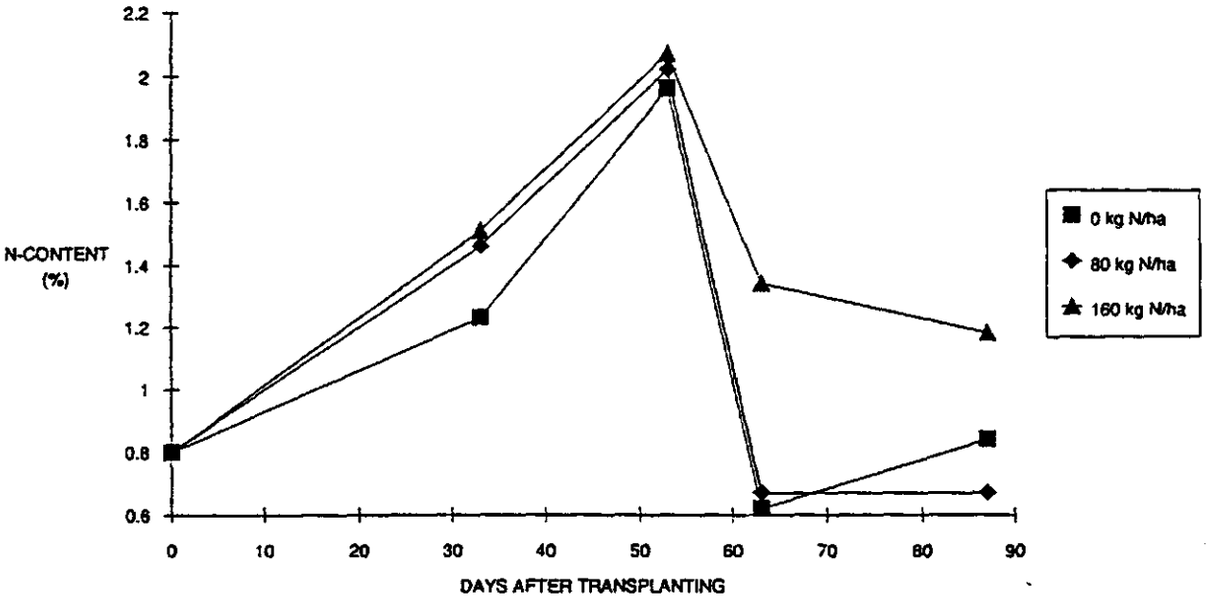
BUD; Tamil Nadu, India; variety: IET 9276



NLBUD2.XLC

N (%) CONTENT LEAF

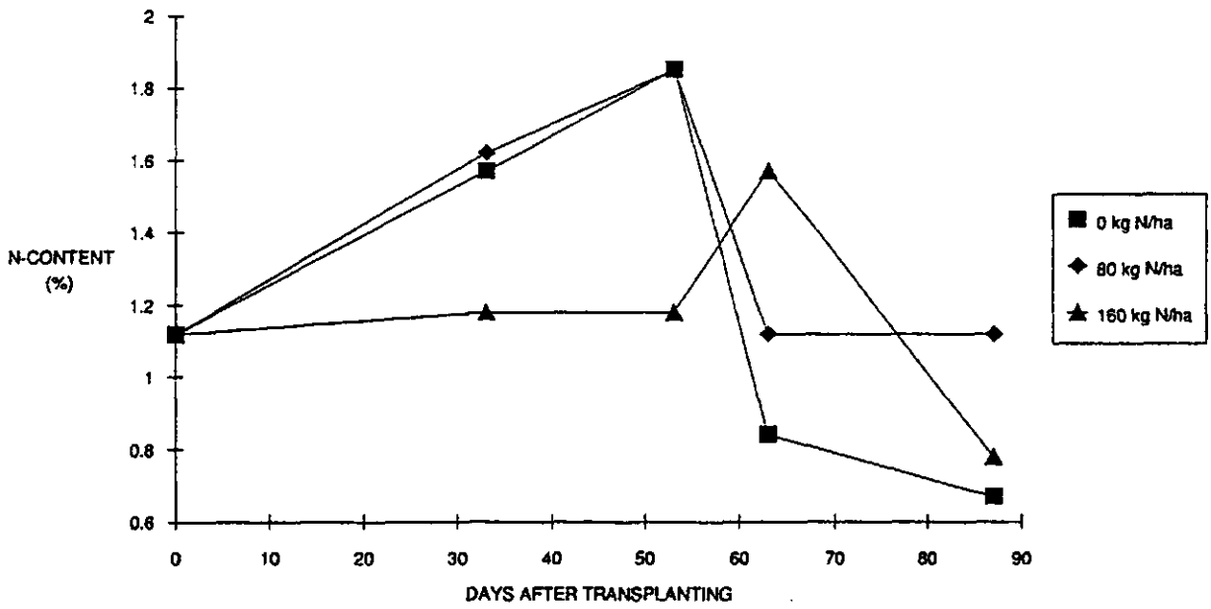
BUD; Tamil Nadu, India; variety: IET 9572



NLBUD3.XLC

N (%) CONTENT LEAF

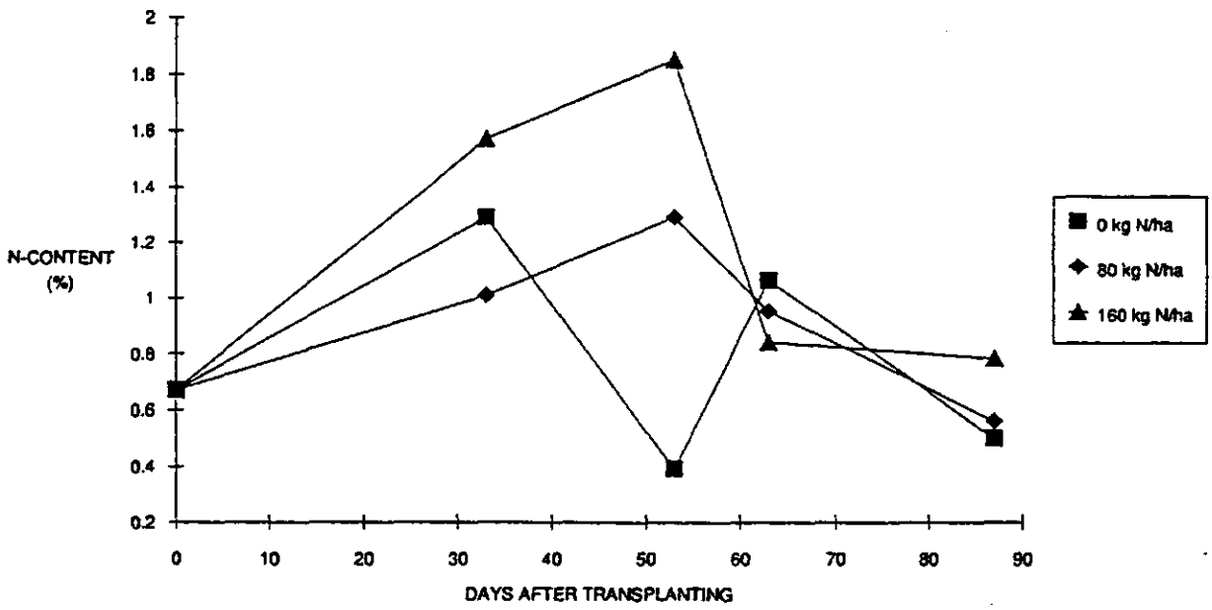
BUD; Tamil Nadu, India; variety: IET 8362



NLBUD4.XLC

N (%) CONTENT LEAF

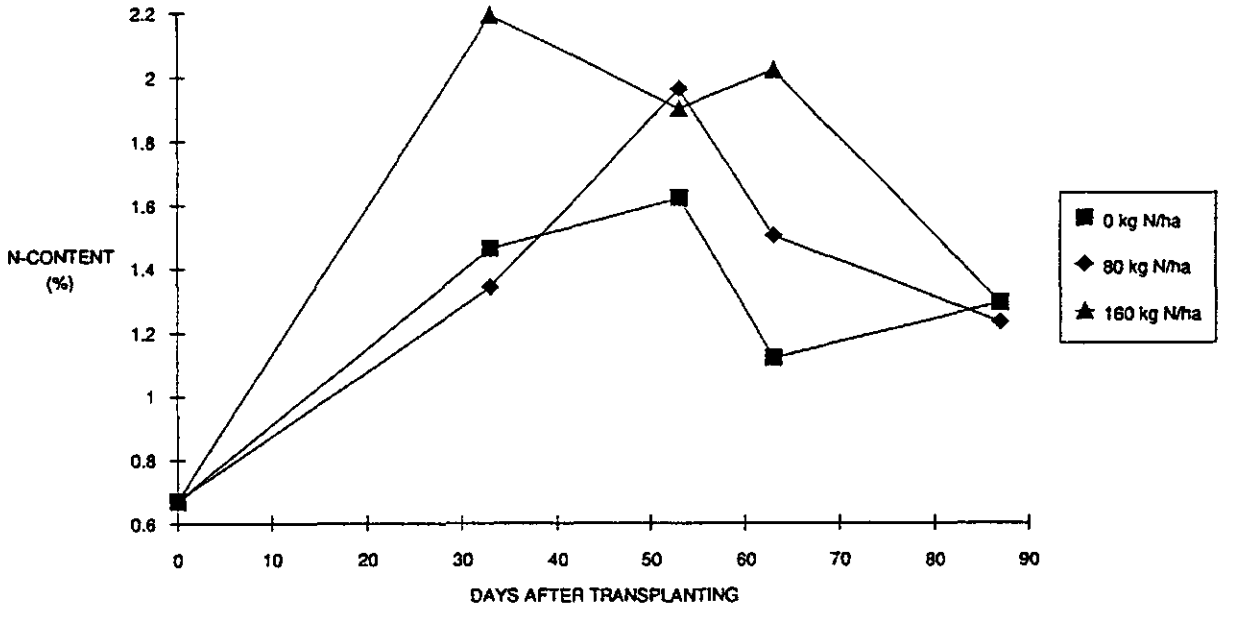
BUD; Tamil Nadu, India; variety: IR 20



NLBUD5.XLC

N (%) CONTENT LEAF

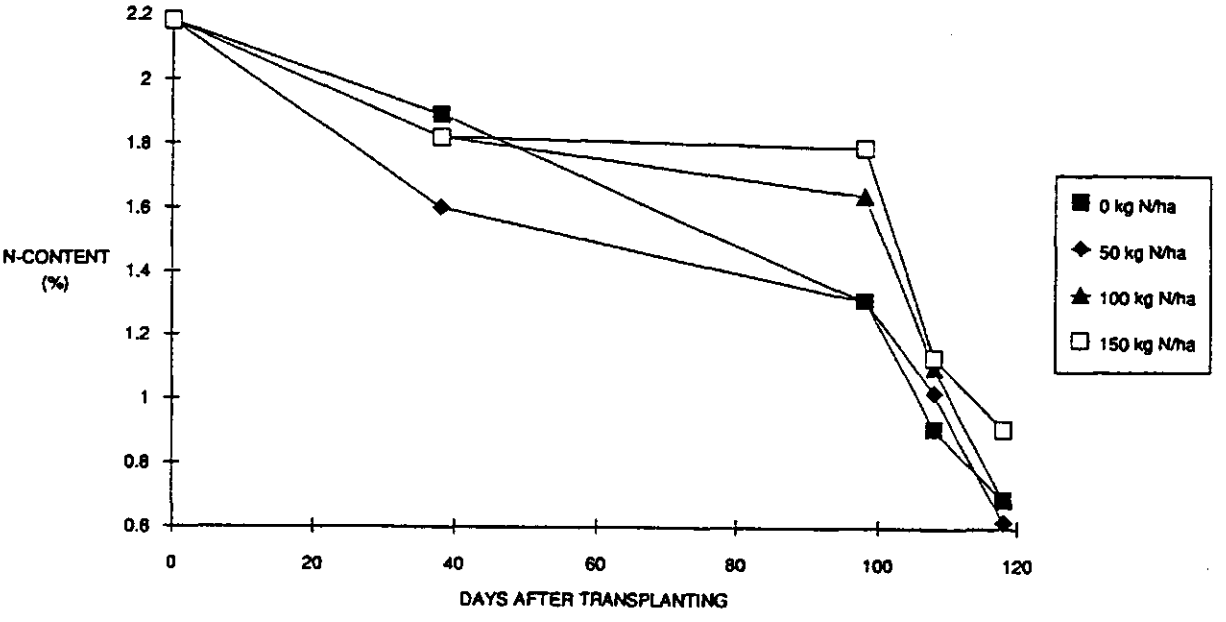
BUD; Tamil Nadu, India; variety: ADT 38



NLRAO.XLC

N (%) CONTENT LEAF

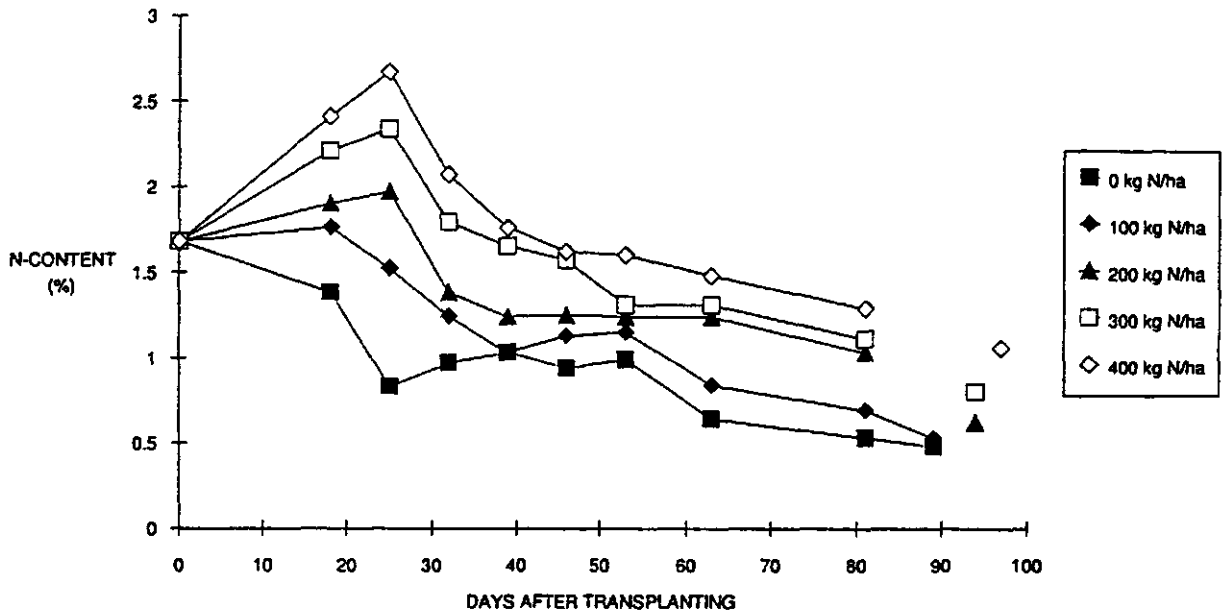
RAO; Cuttack, India; variety: IR 36



NLTMT.XLC

N (%) CONTENT LEAF

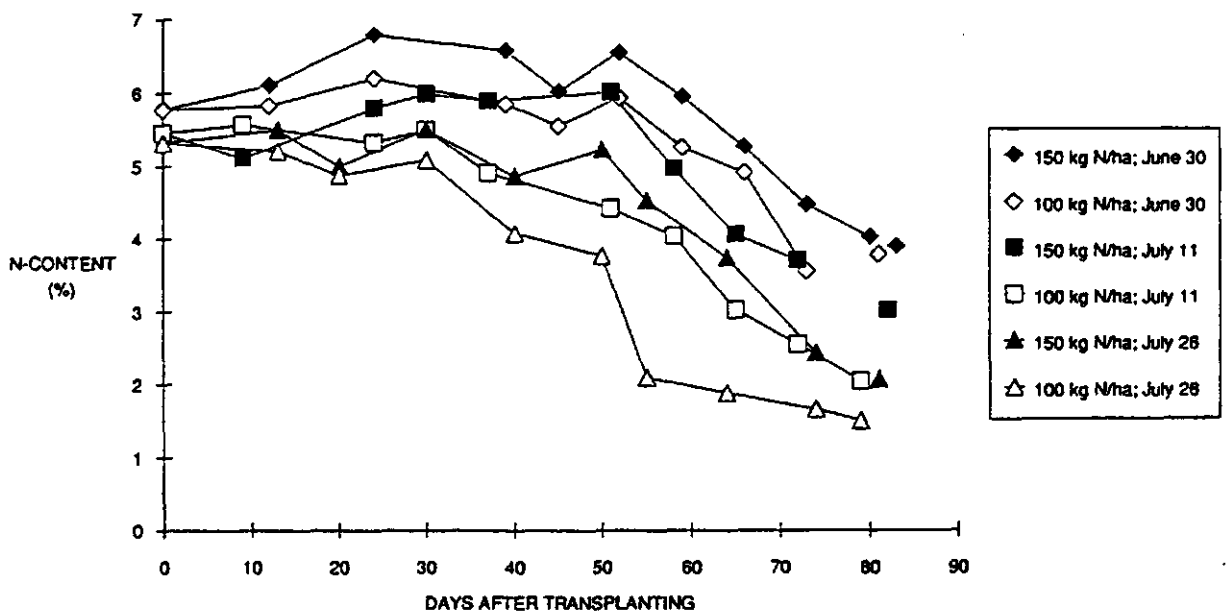
TMT; Tamil Nadu, India; variety: ADT 39



NLMHD1.XLC

N (%) CONTENT LEAF

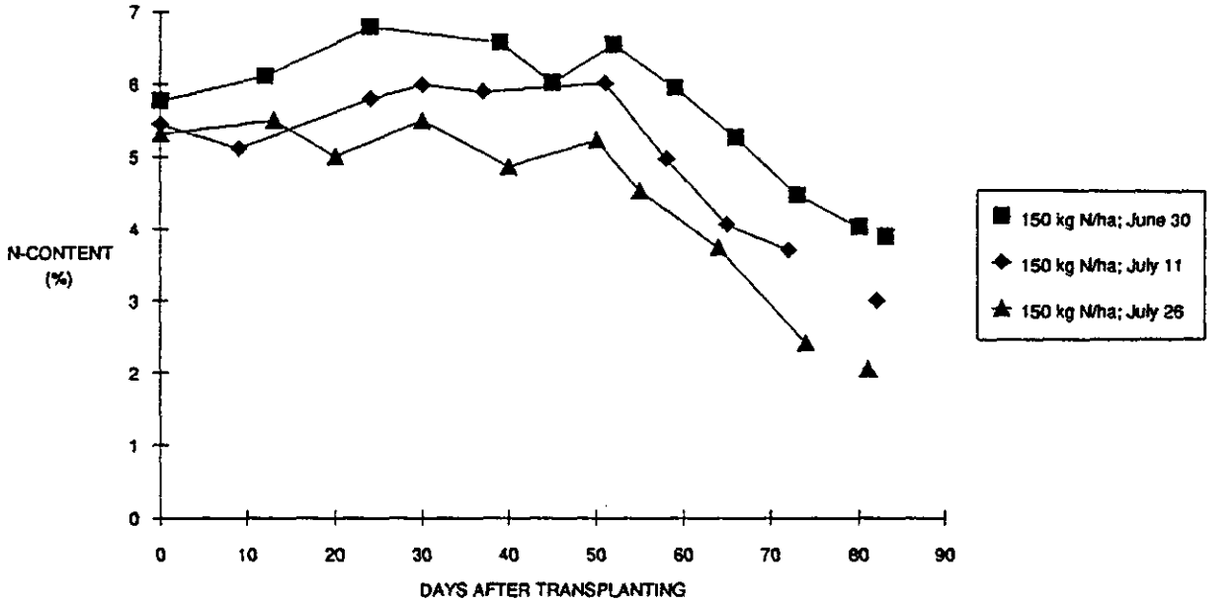
MHD; Tamil Nadu, India; variety: IR 50



NLMHD2.XLC

N (%) CONTENT LEAF

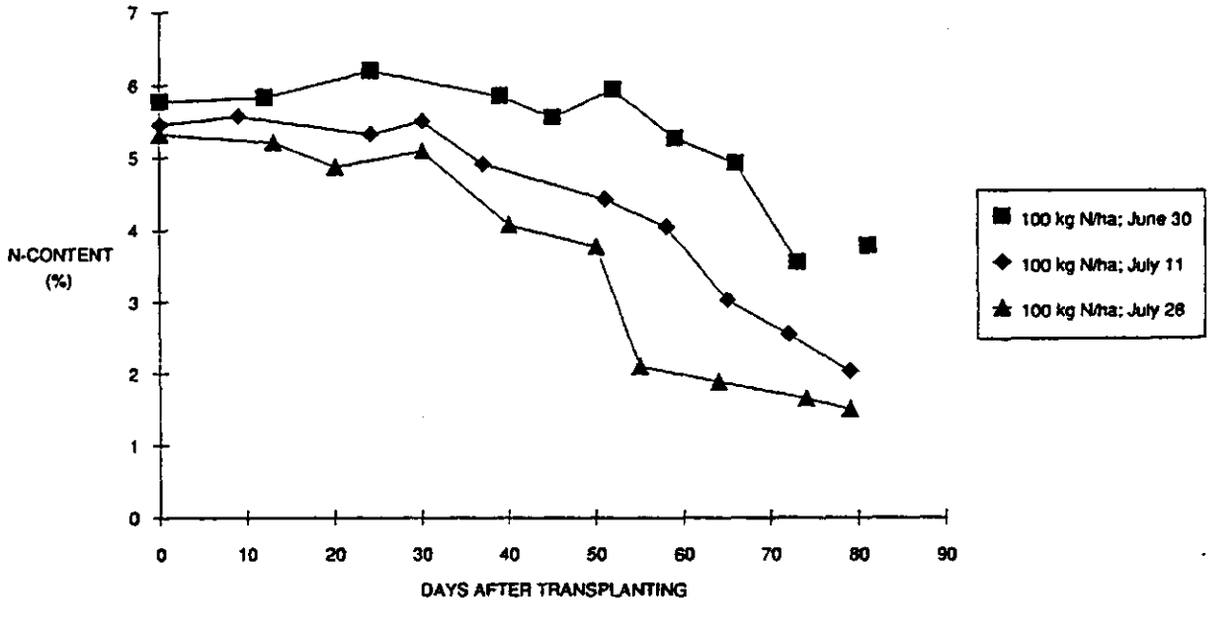
MHD; Tamil Nadu, India; variety: IR 50



NLMHD3.XLC

N (%) CONTENT LEAF

MHD; Tamil Nadu, India; variety: IR 50



3.5 N (%) CONTENT STEM

N (%) CONTENT STEM (KG/HA; NS)

code: BUD
calculation: N-content stem

variety: IET 9276

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.90	0.90	0.90
33	1.01	1.01	0.95
53	0.90	0.90	1.06
63	0.95	1.29	0.62
87	0.74	0.67	0.73

chart: NSBUD1.XLC

variety: IET 9572

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	1.23	1.23	1.23
33	1.23	1.18	1.12
53	0.95	0.34	1.12
63	0.45	0.84	1.01
87	0.67	0.67	0.45

chart: NSBUD2.XLC

variety: IET 8362

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.67	0.67	0.67
33	0.67	0.78	1.01
53	0.95	1.01	1.01
63	0.50	0.67	1.18
87	0.50	0.62	0.67

chart: NSBUD3.XLC

variety: IR 20

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	1.12	1.12	1.12
33	0.90	1.12	0.73
53	0.22	0.50	1.23
63	0.50	0.73	0.95
87	0.78	0.50	0.62

chart: NSBUD4.XLC

NSTEM.XLS

variety: ADT 38

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	1.12	1.12	1.12
33	1.06	1.01	1.18
53	0.95	0.90	1.23
63	0.67	0.62	1.79
87	0.90	0.78	1.12

chart: NSBUD5.XLC

code: RAO
calculation: N-content stem

time	0 kg N/ha	50 kg N/ha	100 kg N/ha	150 kg N/ha
38	4.88	4.22	4.51	5.10
98	2.25	2.80	2.73	3.38
108	1.79	2.15	2.11	2.19
118	1.42	1.71	1.71	2.40

chart: NSRAO.XLC

code: TMT
calculation: N-content stem

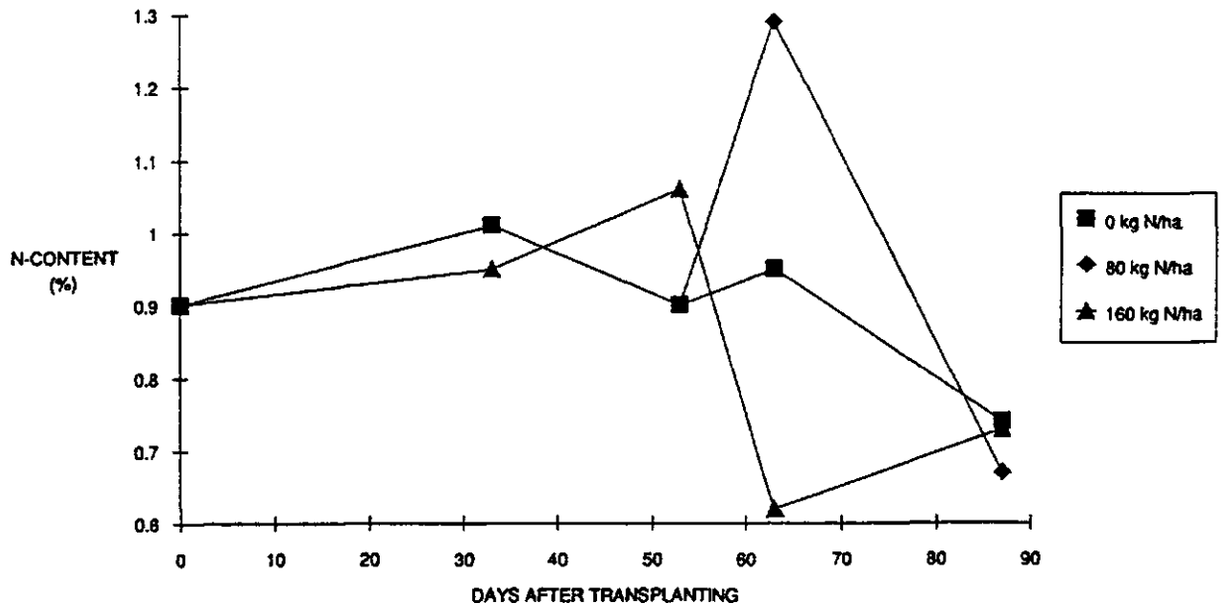
time	0 kg N/ha	100 kg N/ha	200 kg N/ha	300 kg N/ha	400 kg N/ha
0	3.15	3.15	3.15	3.15	3.15
18	2.35	2.62	2.90	3.24	4.00
25	2.00	2.62	3.17	3.93	4.14
32	2.07	2.62	2.76	3.65	3.65
39	2.07	2.40	2.62	3.24	3.38
46	1.93	2.16	2.31	2.84	2.83
53	1.45	2.21	2.41	2.68	2.72
63	1.10	1.82	2.21	2.49	2.72
81	0.97	1.20	1.38	1.69	2.24
89	0.70	0.84			
94			0.94	0.95	
97					0.98

chart: NSTMT.XLC

NSBUD1.XLC

N (%) CONTENT STEM

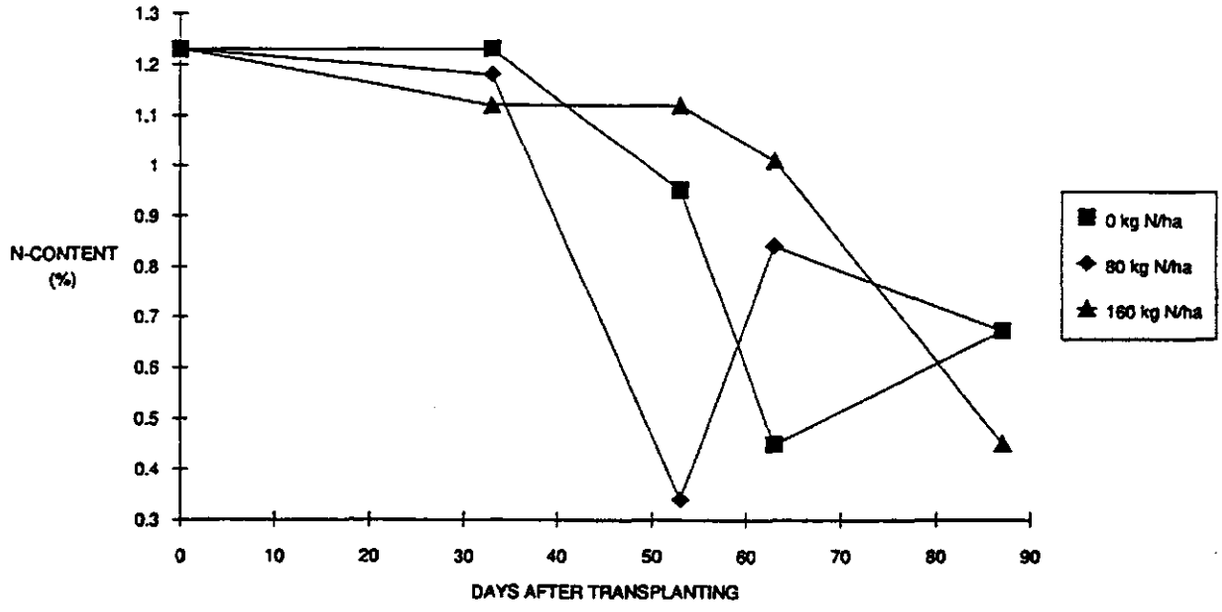
BUD; Tamil Nadu, India; variety: IET 9276



NSBUD2.XLC

N (%) CONTENT STEM

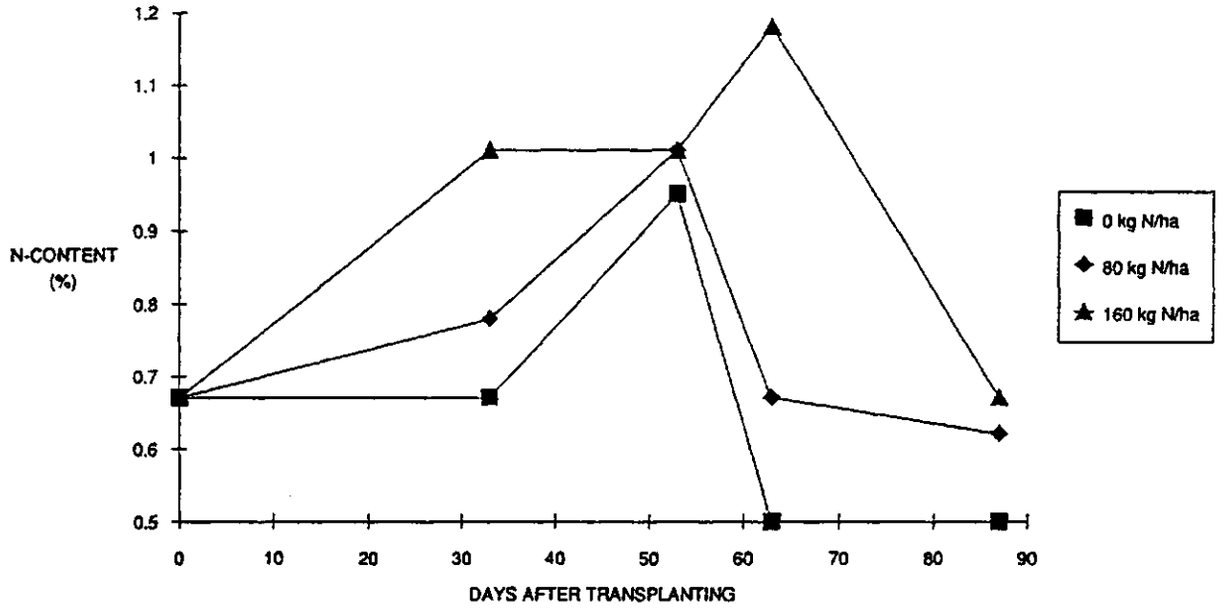
BUD; Tamil Nadu, India; variety: IET 9572



NSBUD3.XLC

N (%) CONTENT STEM

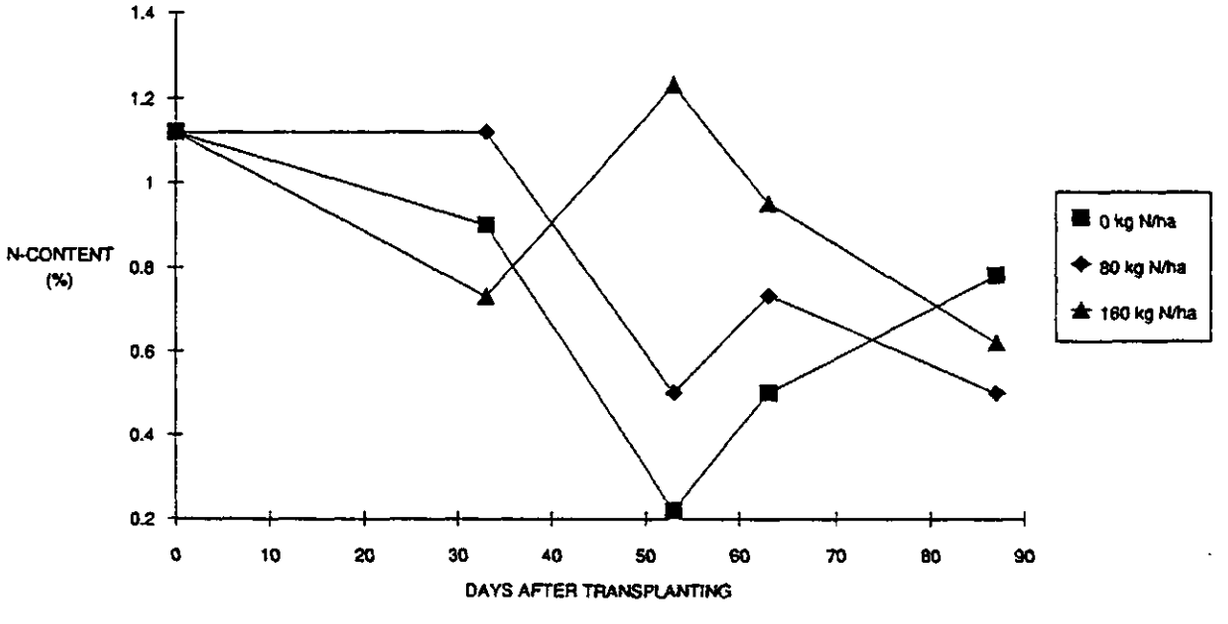
BUD; Tamil Nadu, India; variety: IET 8362



NSBUD4.XLC

N (%) CONTENT STEM

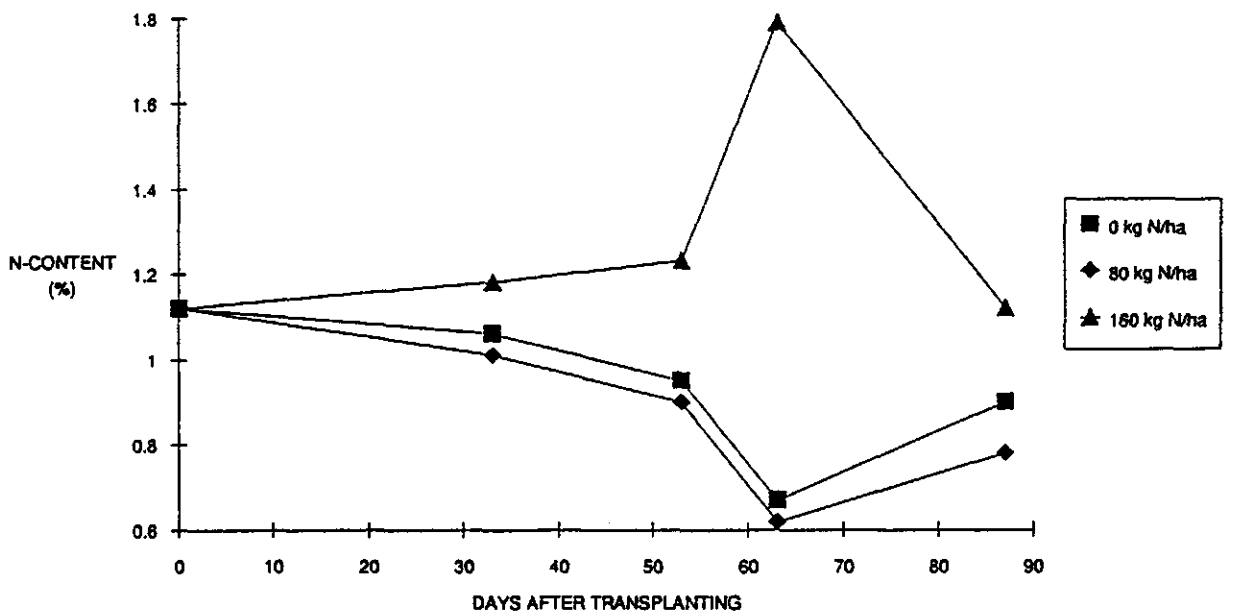
BUD; Tamil Nadu, India; variety: IR 20



NSBUD5.XLC

N (%) CONTENT STEM

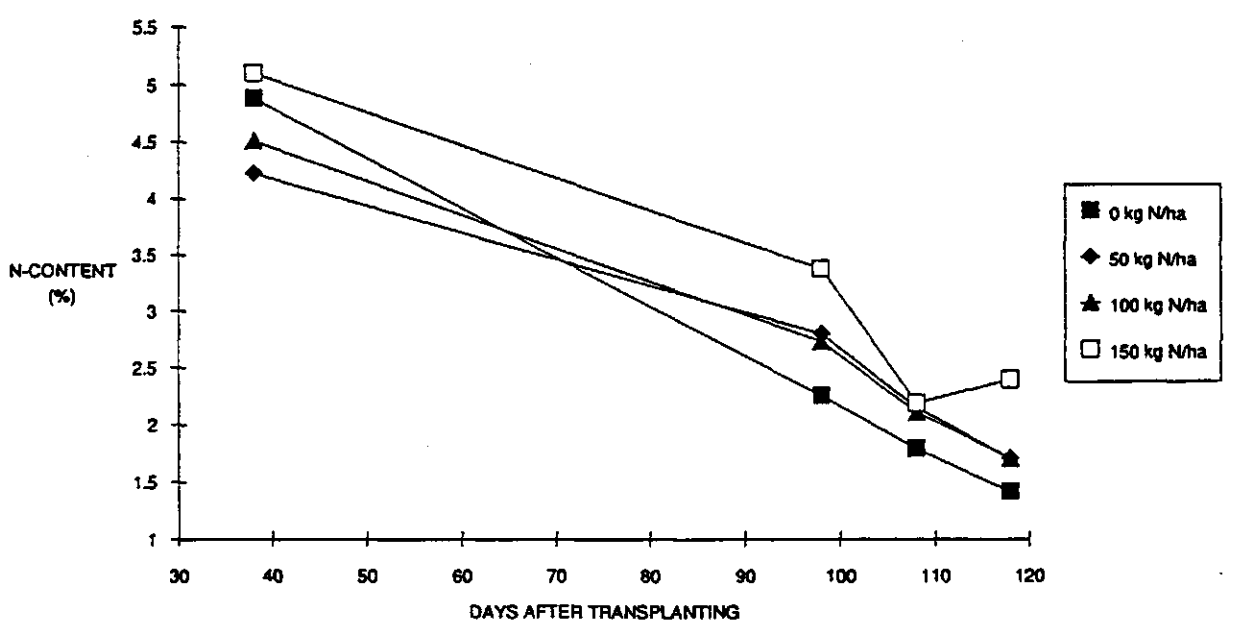
BUD; Tamil Nadu, India; variety: AOT 38

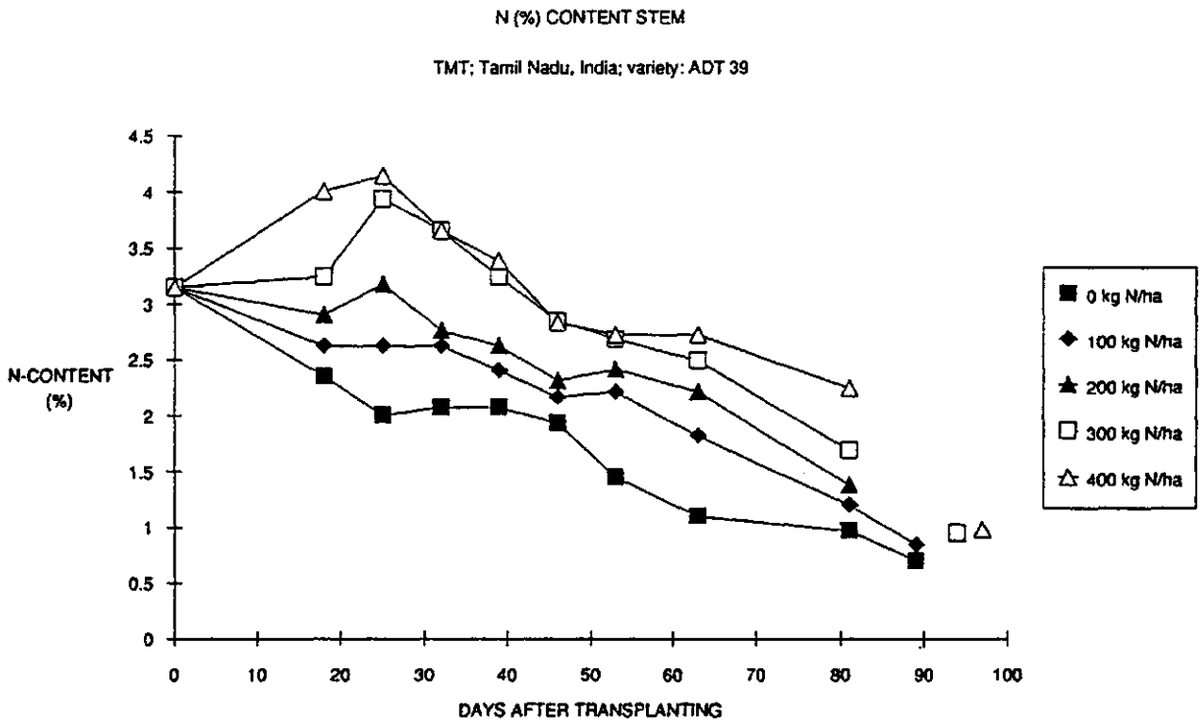


NSRAO.XLC

N (%) CONTENT STEM

RAO; Cuttack, India; variety: IR 36




N (%) CONTENT STEM
TMT; Tamil Nadu, India; variety: ADT 39
N-CONTENT (%)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
0
10
20
30
40
50
60
70
80
90
100
DAYS AFTER TRANSPLANTING
0 kg N/ha
100 kg N/ha
200 kg N/ha
300 kg N/ha
400 kg N/ha

N (%) CONTENT ROOT (KG/HA; NR)

code: BUD
calculation: N-content root

variety: IET 9276

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.73	0.73	0.73
33	0.90	0.95	0.84
53	0.67	0.78	1.01
63	0.73	0.67	0.78
87	0.74	0.73	0.78

chart: NRBUD1.XLC

variety: IET 9572

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.76	0.76	0.76
33	1.06	1.18	0.90
53	0.90	0.84	0.84
63	0.62	0.62	0.73
87	0.56	0.84	0.78

chart: NRBUD2.XLC

variety: IET 8362

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.56	0.56	0.56
33	0.78	0.62	0.73
53	0.84	0.73	0.90
63	0.50	0.78	0.73
87	0.73	0.78	0.84

chart: NRBUD3.XLC

variety: IR 20

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.56	0.56	0.56
33	0.73	0.62	0.17
53	0.67	0.84	1.12
63	0.62	0.67	0.73
87	0.56	0.67	0.67

chart: NRBUD4.XLC

variety: ADT 38

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
0	0.56	0.56	0.56
33	1.06	1.01	1.06
53	0.67	1.01	1.18
63	0.78	0.67	1.46
87	0.45	0.51	0.85

chart: NRBUD5.XLC

code: RAO
calculation: N-content root

time	0 kg N/ha	50 kg N/ha	100 kg N/ha	150 kg N/ha
0	1.60	1.60	1.60	1.60
38	1.64	1.82	1.67	1.57
98	1.09	1.09	1.13	1.38
108	0.91	0.98	0.94	0.98
118	0.91	1.02	0.88	1.05

chart: NRRAO.XLC

code: TMT
calculation: N-content root

time	0 kg N/ha	100 kg N/ha	200 kg N/ha	300 kg N/ha	400 kg N/ha
0	0.34	0.34	0.34	0.34	0.34
18	0.53	0.90	0.98	1.12	1.20
25	0.51	0.82	0.87	0.95	1.03
32	0.55	0.86	0.90	1.03	1.34
39	0.83	0.91	1.03	1.29	1.68
46	0.78	0.84	1.03	1.16	1.59
53	0.81	0.84	1.03	1.14	1.51
63	0.78	0.84	1.02	1.12	1.38
81	0.70	0.76	0.90	1.01	1.12
89	0.64	0.64			
94			0.78	0.90	
97					1.06

chart: NRTMT.XLC

NROOT.XLS

code: RAM
calculation: N-content root

time	no drainage 100 kg N/ha; 150 kg N/ha; 200 kg N/ha; no drainage		
30	0.91	0.92	0.90
40	0.92	1.02	1.01
50	0.85	0.76	0.72
60	0.68	0.52	0.50
70	0.52	0.49	0.48
80	0.44	0.42	0.39
90	0.40	0.40	0.38

chart: NRRAM.XLC

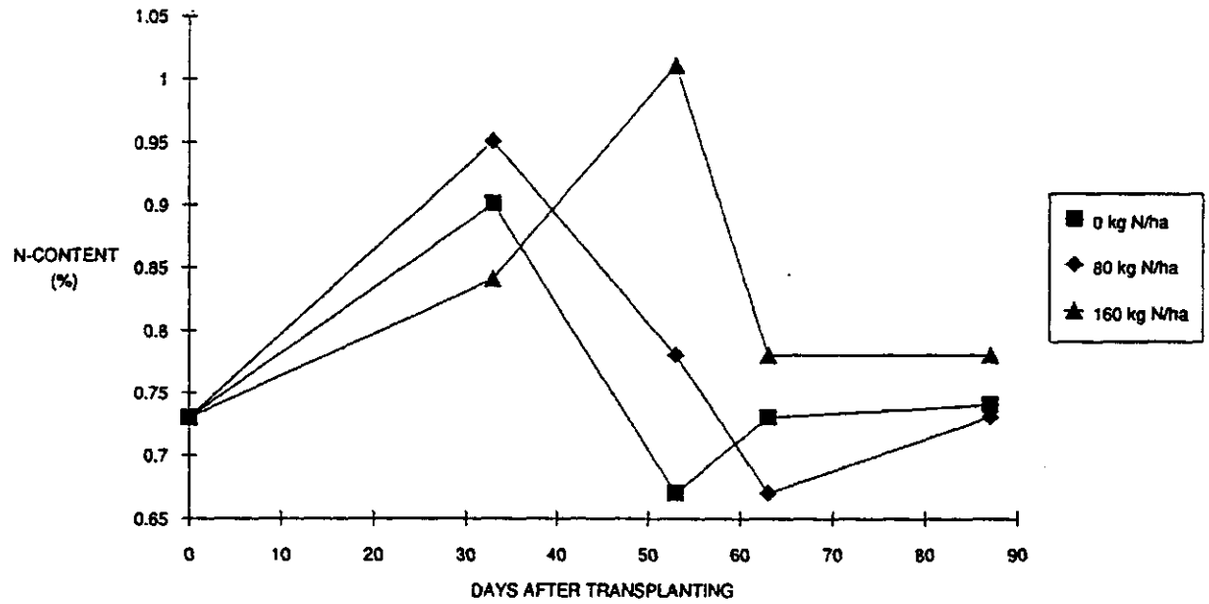
time	drainage 100 kg N/ha; 150 kg N/ha; 200 kg N/ha; drainage		
30	0.82	0.90	0.91
40	0.95	1.14	1.16
50	0.96	1.15	1.16
60	1.01	1.13	1.15
70	0.91	1.11	1.12
80	0.86	1.08	1.13
90	0.82	1.01	1.05

NOTE: harvest date is not known but to create the graph a number is needed (here: 90)

NRBUD1.XLC

N (%) CONTENT ROOT

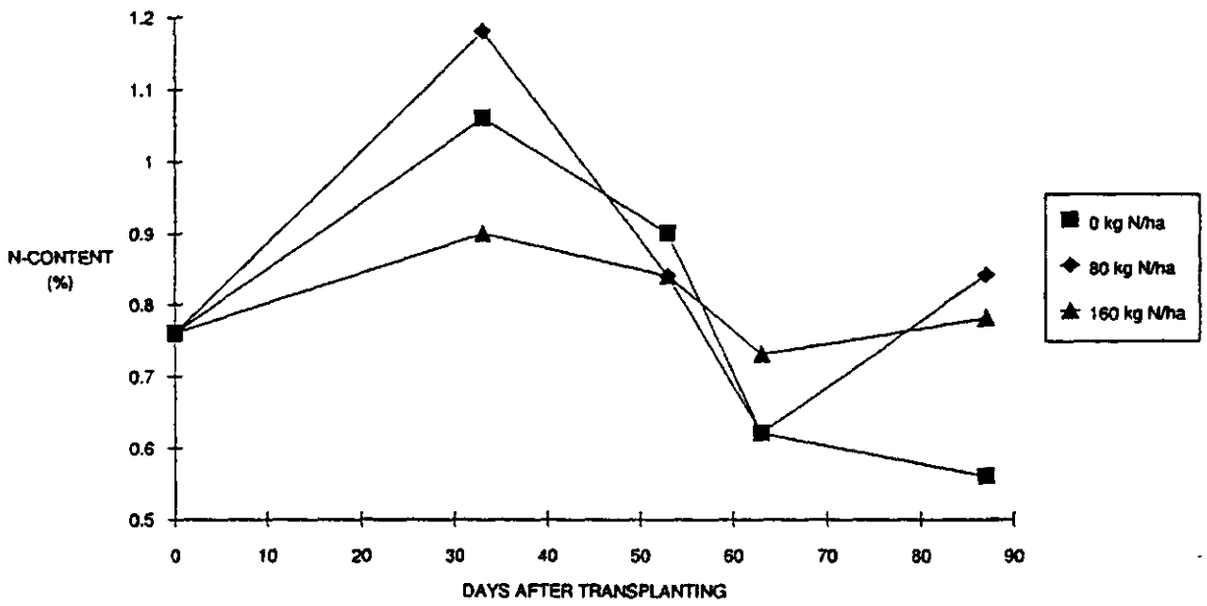
BUD; Tamil Nadu, India; variety: IET 9276



NRBUD2.XLC

N (%) CONTENT ROOT

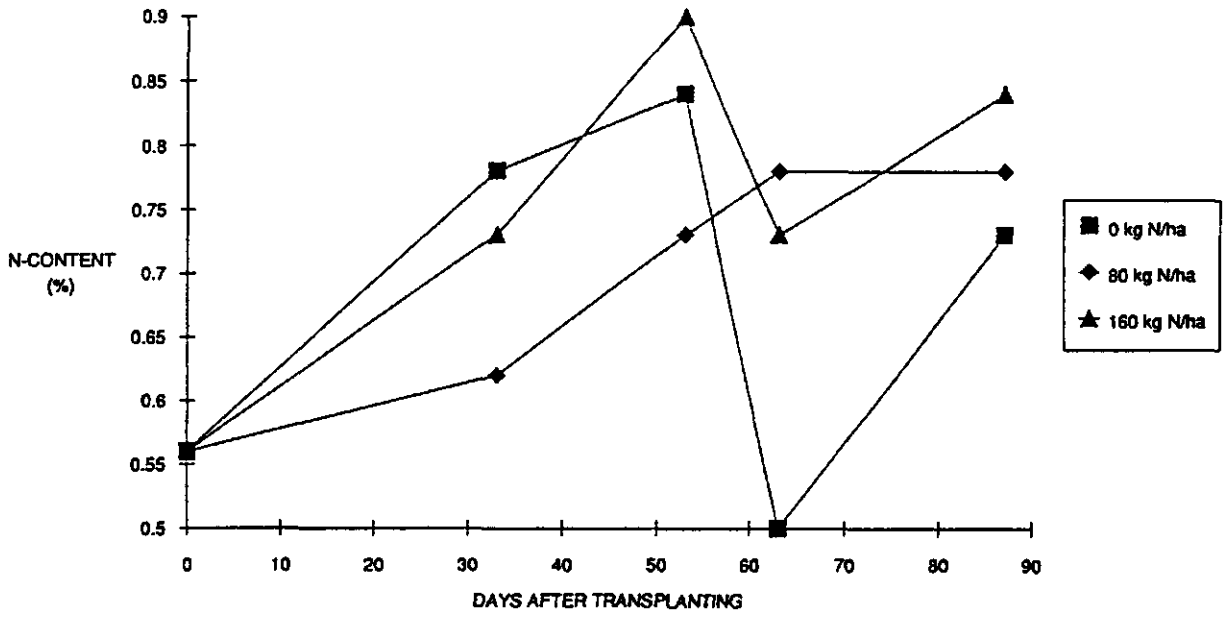
BUD; Tamil Nadu, India; variety: IET 9572



NRBUD3.XLC

N (%) CONTENT ROOT

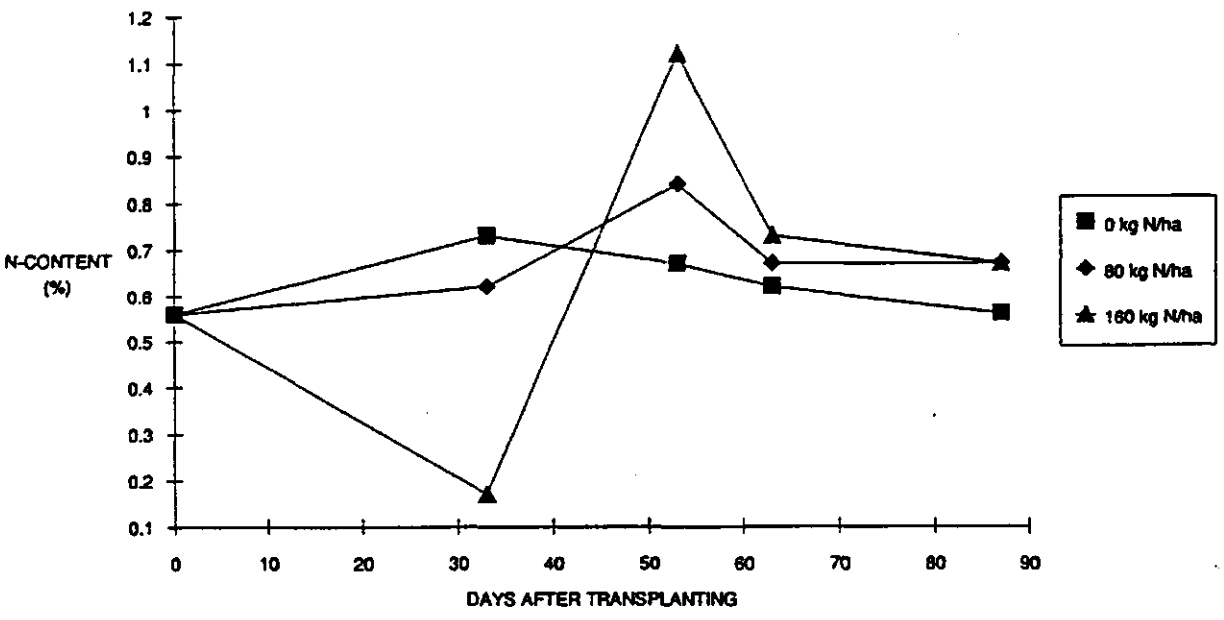
BUD; Tamil Nadu, India; variety: IET 8362



NRBUD4.XLC

N (%) CONTENT ROOT

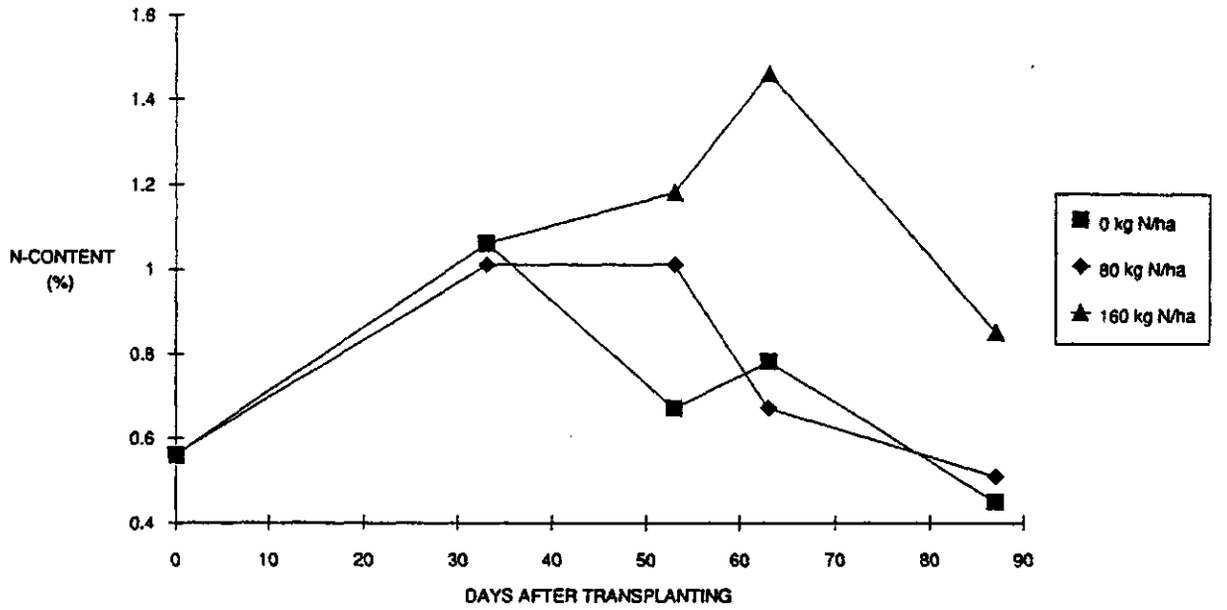
BUD; Tamil Nadu, India; variety: IR 20



NR8UD5.XLC

N (%) CONTENT ROOT

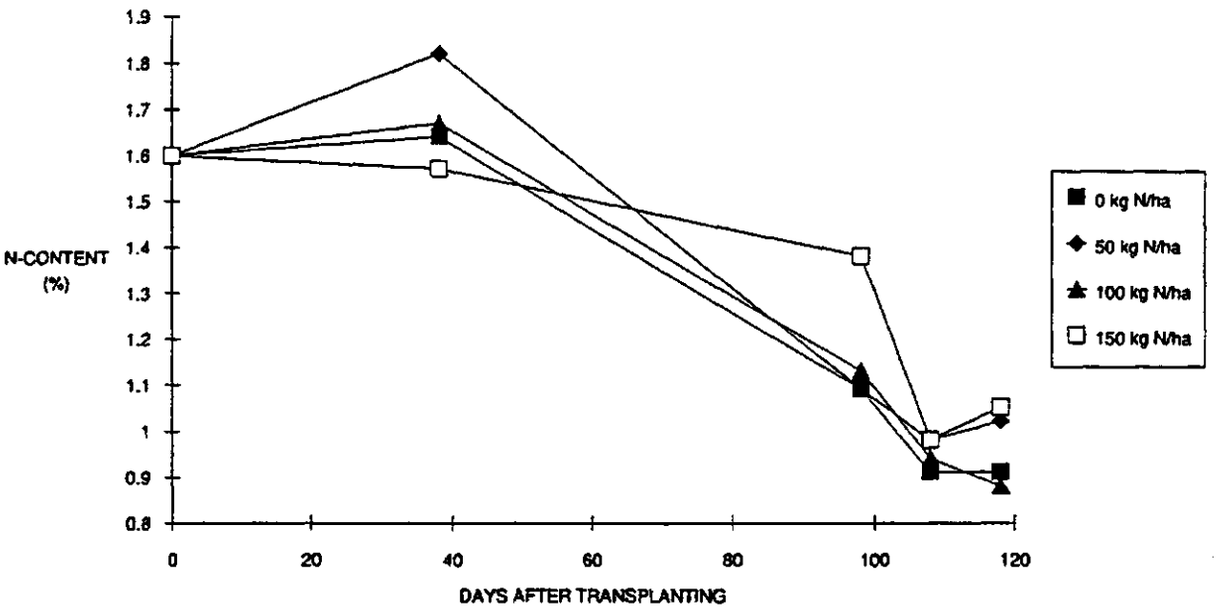
BUD; Tamil Nadu, India; variety: ADT 38



NRRAO.XLC

N (%) CONTENT ROOT

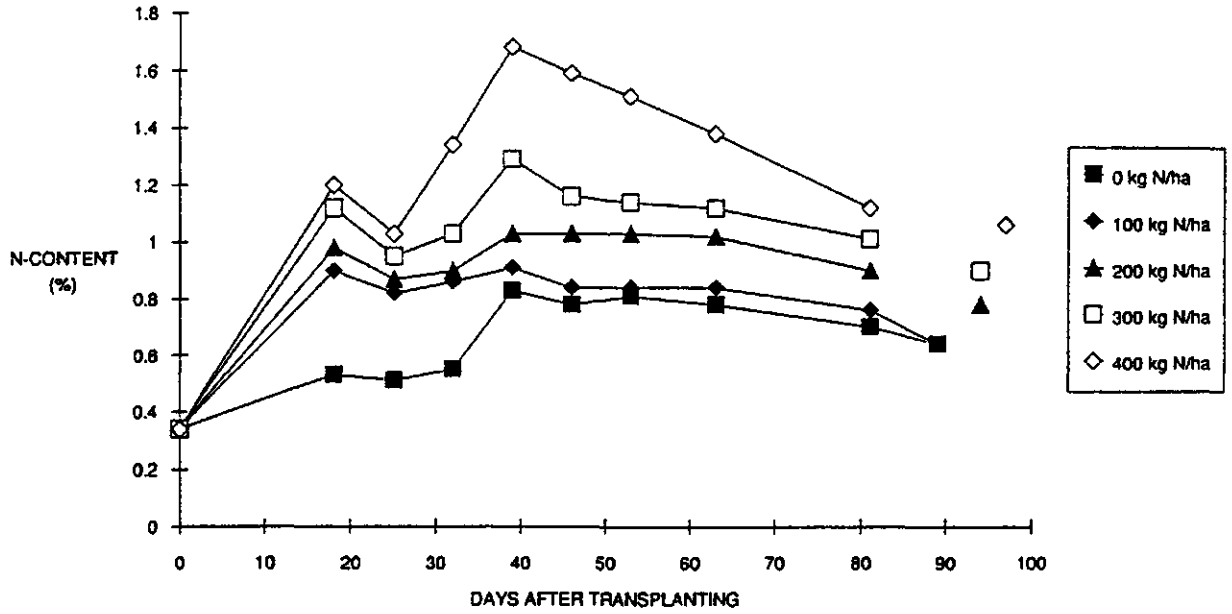
RAO; Tamil Nadu, India; variety: IR 36



NRTMT.XLC

N (%) CONTENT ROOT

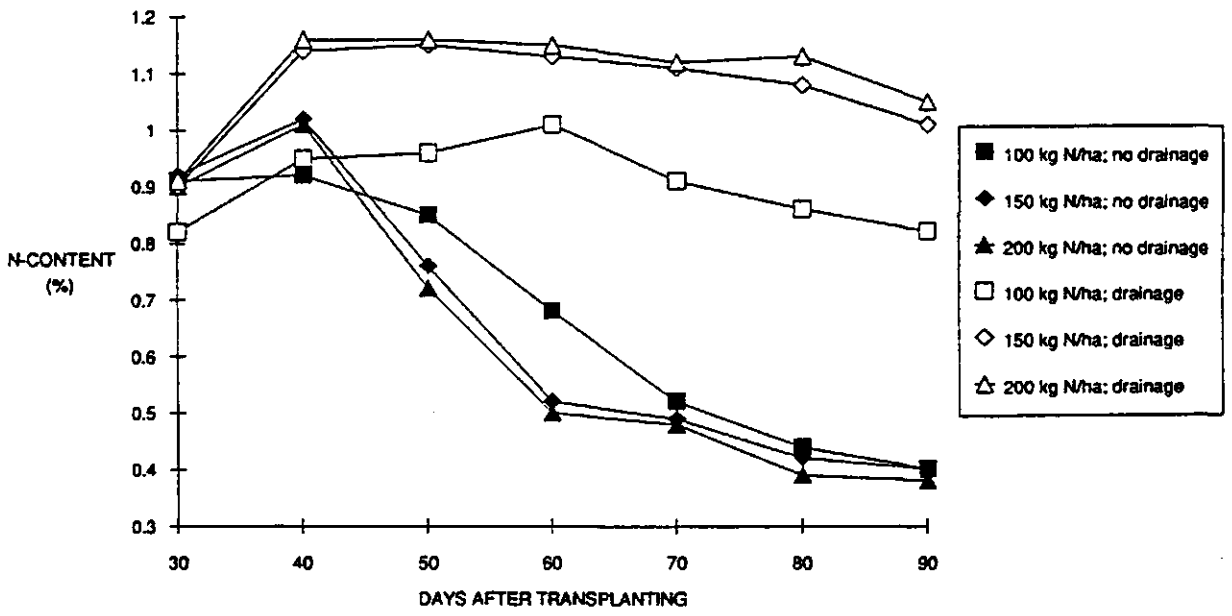
TMT; Tamil Nadu, India; variety: ADT 39



NRRAM.XLC

N (%) CONTENT ROOT

RAM; Tamil Nadu, India; variety: IR 50



3.7 N(%) CONTENT GRAIN

N (%) CONTENT GRAIN (KG/HA; NL)

code: BUD
calculation: N-content grain

variety: IET 9276

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
53	0.9	0.7	1.1
63	0.8	1.3	0.9
87	1	0.8	0.6

chart: NGBUD1.XLC

variety: IET 9572

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
63	0.6	0.7	0.5
87	0.5	0.9	1

chart: NGBUD2.XLC

variety: IET 8362

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
53	0.9	1	0.9
63	0.9	0.9	0.9
87	0.9	0.9	0.9

chart: NGBUD3.XLC

variety: IR 20

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
53	1		
63	0.5	0.7	0.6
87	0.7	0.6	0.6

chart: NGBUD4.XLC

variety: ADT 38

time	0 kg N/ha	80 kg N/ha	160 kg N/ha
53	1.1	1.2	0.06
63	0.9	0.7	0.57
87	1.5	1	0.79

chart: NGBUD5.XLC

code: RAO
calculation: N-content grain

time	0 kg N/ha	50 kg N/ha	100 kg N/ha	150 kg N/ha
108	1.74	1.89	1.92	1.99
118	1.11	1.13	1.24	1.6
130	1	1.09	1.3	1.45

chart: NGRAO.XLC

code: TMT
calculation: N-content grain

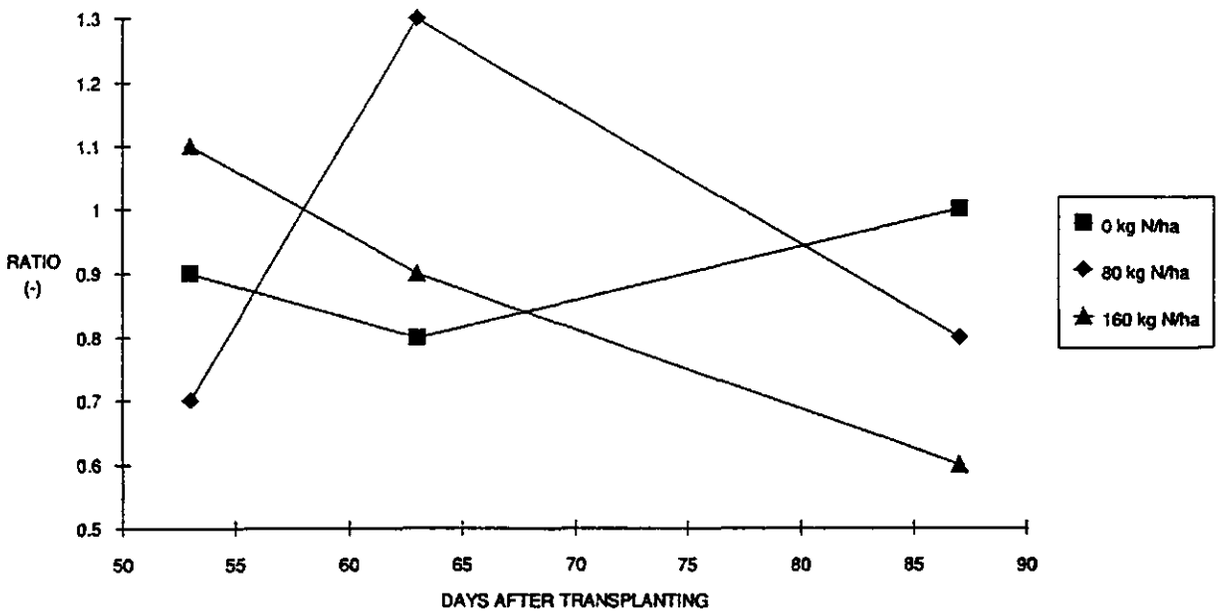
time	0 kg N/ha	100 kg N/ha	200 kg N/ha	300 kg N/ha	400 kg N/ha
97	1.11	1.24	1.54	1.72	1.77

chart: NGTMT.XLC

NGBUD1.XLC

N (%) CONTENT GRAIN

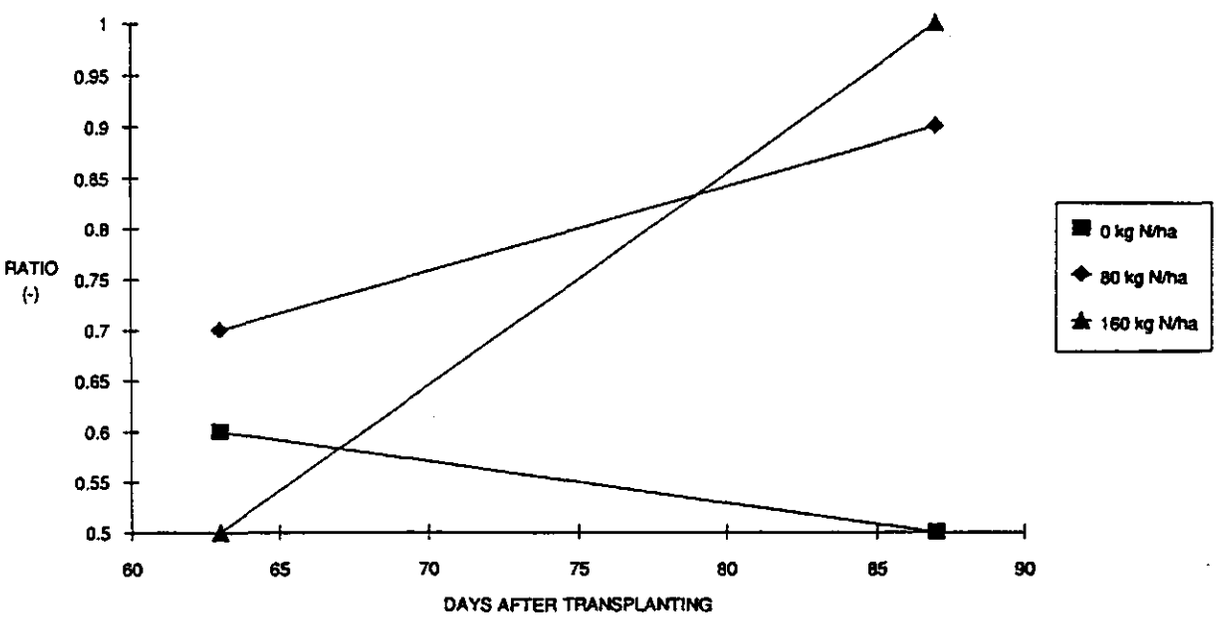
BUD, Tamil Nadu, India; variety: IET 9276



NGBUD2.XLC

N (%) CONTENT GRAIN

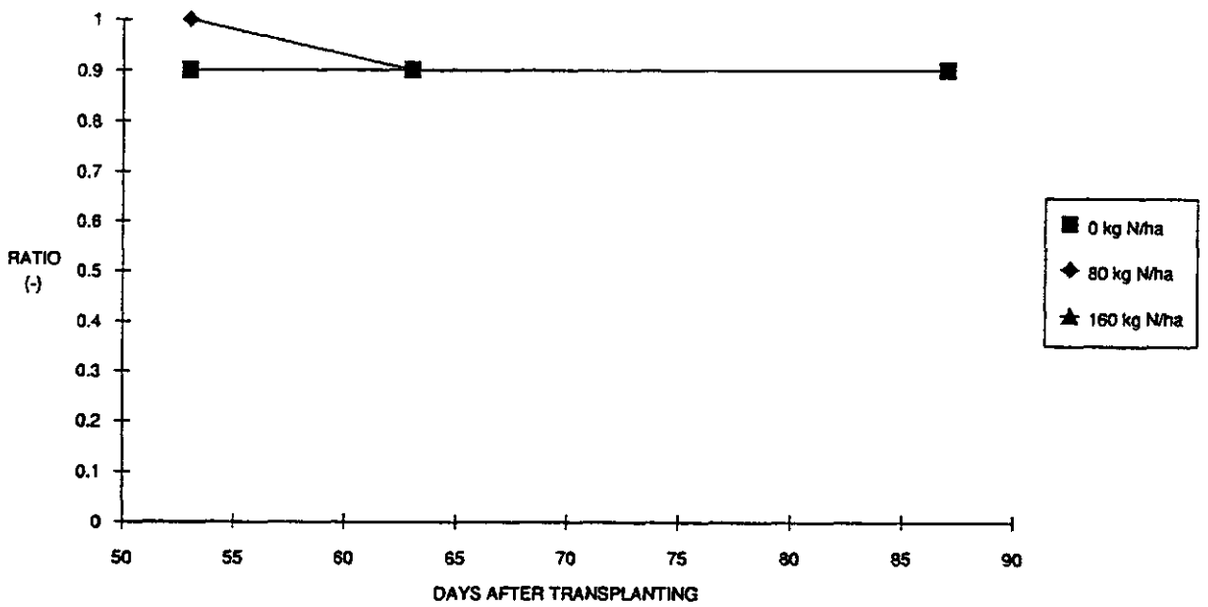
BUD, Tamil Nadu, India; variety: IET 9572



NGBUD3.XLC

N (%) CONTENT GRAIN

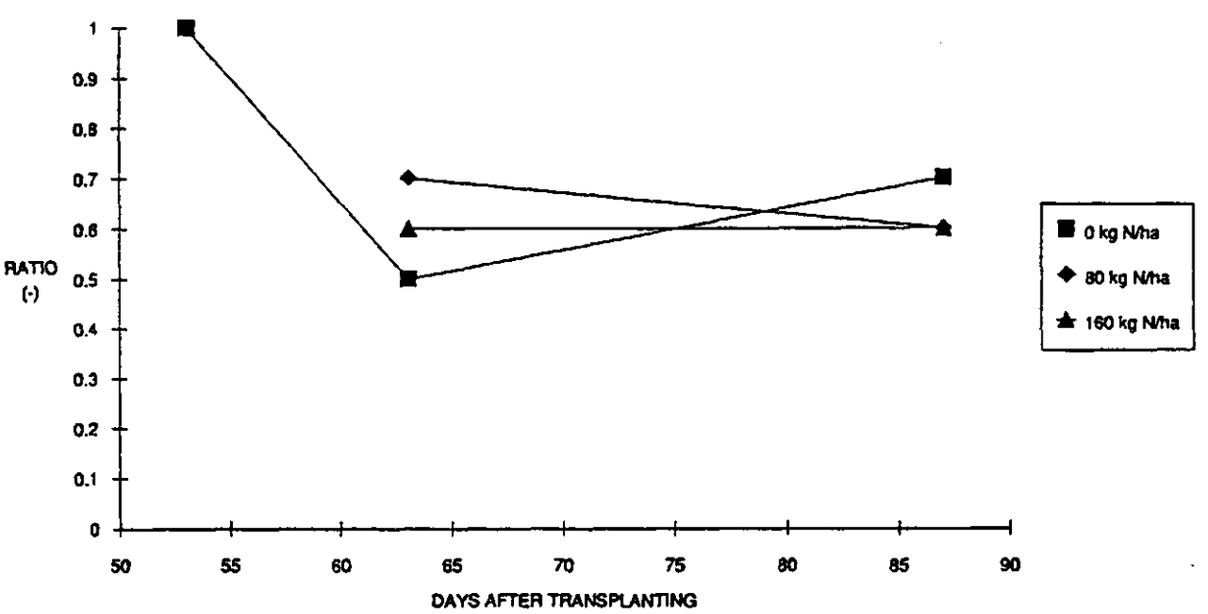
BUD, Tamil Nadu, India; variety: IET 8362



NGBUD4.XLC

N (%) CONTENT GRAIN

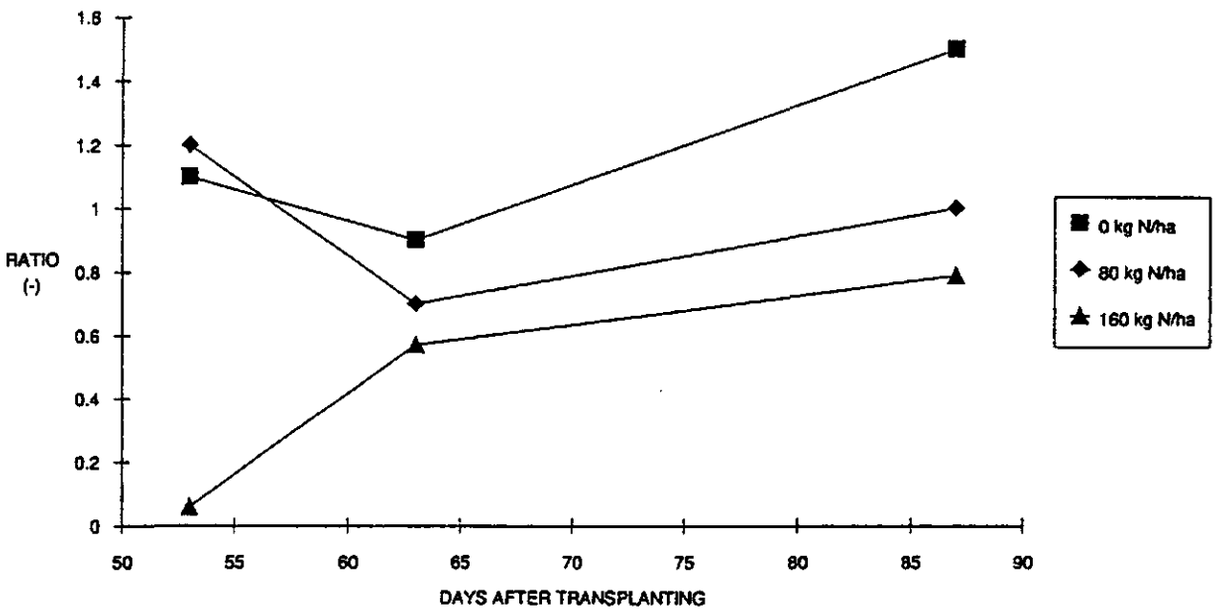
BUD, Tamil Nadu, India; variety: IR 20



NGBUD5.XLC

N (%) CONTENT GRAIN

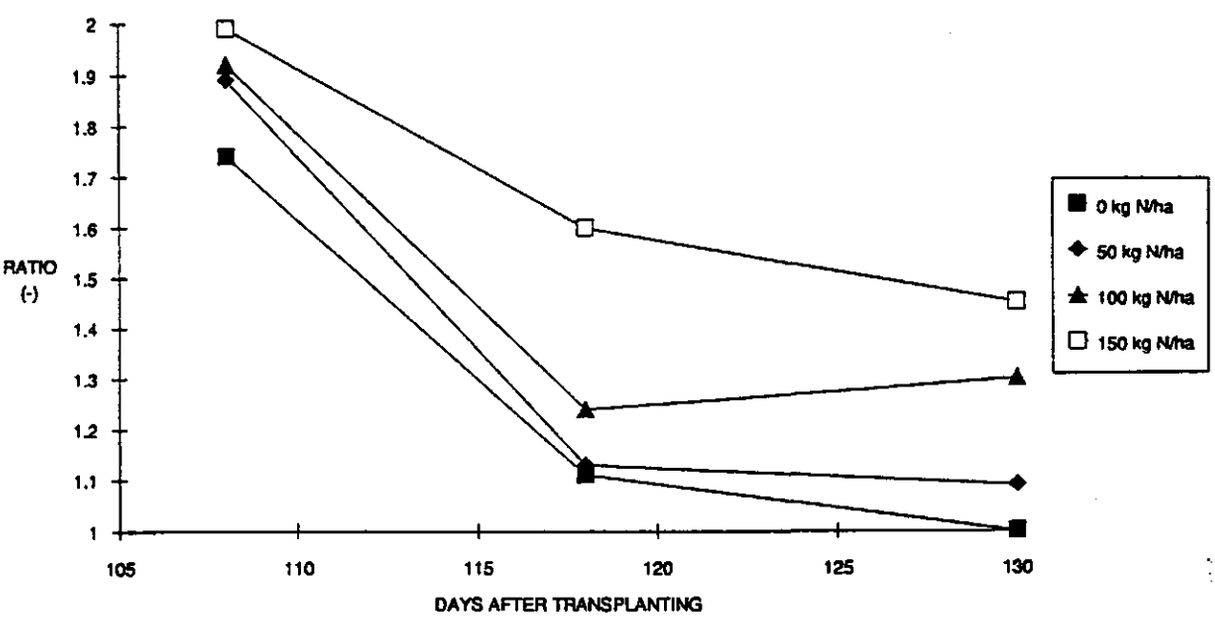
BUD, Tamil Nadu, India; variety: ADT 38



NGRAO.XLC

N (%) CONTENT GRAIN

RAO; Cuttack, India; IR 36



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