



REFERENCES

- Aksornkoae, S. 1982. Productivity and energy relationship of mangrove plantation of *Rhizophora apiculata* in Thailand. Symposium on Mangrove Forest Ecosystem Productivity in Southeast Asia. Biotrop Special Publication No.17. 25-31pp.
- . 1989. Mangrove...Ecology and Management. Compute Advertising, Thailand. 251pp.(in Thai)
- ., C. Khemmark and W. Kaitpraneet. 1979. Nutrient cycling in mangrove forest. The final report submitted to National Research Council Thailand, Bangkok.
- ., S. Panichsuko, W. Srisawasdi, P. Thammachote, S. Mooksombat and R. Onsanit. 1986. Productivity and mortality of mangrove plantation in an abandoned mining area for coastal zone development of Thailand. UNDP/UNESCO. Aksornsiam Press, Bangkok, Thailand. 31pp.
- Athisuk, K., K. Thuphom, B. Sungvaranond, Y. Lertruengdej and A. Wongputhpitak. 1986. Pesticide residues in shrimp and environmental samples in shrimp farm area, Changwat Samutprakarn. Thai fisheries Gazette. 39(2):203-209.(in Thai)
- Bamroongrugsas, N. 1991. Mangrove plantation on new mud flat area of Pattani Bay. Paper presented on the seventh national seminar on mangrove ecology. 22-25 July. p IV-8: 1-16 (in Thai).

- Banus, M.D. and S.E. Kolehmainen. 1975. Floating, Rooting and Growth of Red Mangrove (*Rhizophora mangle* L.) Seedling: Effect on Expansion of Mangrove in Southeastern Puerto Rico. Proceeding of The International Symposium on Biology and Management of Mangroves. Volume I. Institute of Food and Agriculture Science, University of Florida. 371-384pp.
- Banijbatana, D. 1957. Mangrove Forest in Thailand. Proceeding of the Ninth Pacific Science Congress. 11:22-34 pp., Pacific Science Assoc., Bangkok.
- Berry, A. J. 1972. The Natural History of West Malaysian Mangrove Faunas. Mal. Nat. J. 25(2):135-162.
- Bhodthipuks, P. 1988. Problem Solving on Mangrove Forest Land for Developed Tiger Shrimps (*Penaeus monodon*) Culture. Paper presented on the sixth national seminar on mangrove ecology. 29-31 August. 49-55pp. (in Thai)
- . and K. Prayuneyong. 1988. Experiment on propagation Technique of *Avicennia alba* and *Cerriops tagal* by bare root planting root cutting stump planting and direct transplant from natural mangrove. Paper presented on the sixth national seminar on mangrove ecology. 29 - 31 August. 79-82pp. (in Thai)
- Board of Department of Soil Science, 1983. Introduction of Soil. Department of Soil Science, Kasetsart University. 673pp.

- Chantadisai, T. 1990. Social Impact of mangrove resource management and aquaculture development. Paper presented on first Forum for Annual Reporting on Environment. 20-21 January. 93-100pp. (in Thai)
- Chantadisai, T. and V. Apinan. 1985. The Aquaculture in The Mangrove Area. Paper presented on The Seminar of Aquatic Life Resources. Chulalongkorn University. 7-8 March. 391-406pp. (in Thai).
- Chareonsurbsakul, W. 1988. Mangrove Plantation (*Rhizophora apiculata*) with two pieces cutting and three pieces cutting pods. Paper presented on the sixth national seminar on mangrove ecology. 29-31 August. 70-78 pp. (in Thai).
- Chapman, V. J. 1970. Mangrove Phytosociology. Trop. Ecol. 11:1-19.
- Chapman, 1976. Mangrove Vegetation. Strauss & Cramer GmbH, 6901 Leutershausen Germany. 447pp.
- . 1977. Wet Coastal Formation of Indo-Malasia and Papua-New Guinea in Ecosystem of The World I. Wet Coastal Ecosystems. (Chapman, V.J. (ed.)). pp.261-270
- Clarke, L.D. and Hannon N.J. 1969. The Mangrove Swamp and Salt Marsh Communities of The Sydney District II. The Holocoenotic Complex with Particular Reference to Physiography. Journal of Ecology, 57: 213-234.

- Clarke, L.D. and Hannon N.J. 1970. The Mangrove Swamp and Salt Marsh Communities of The Sydney District III. Plant Growth in Relation to Salinity and Water Logging. Journal of Ecology. 58:351-369.
- de Haan, J.H. 1931. Het Enn En Ander over de Tijlatjap Sche Vloedbosschen. Tectona, 24:39-76. (English summary).
- Dej-anant, K. and P. Denrungruang. 1988. Utilization of The Bark of Some Mangrove Species. Paper presented on the sixth national seminar on mangrove ecology. 29-31 August. 174-180 pp. (in Thai).
- Ding Hou. 1958. Rhizophoraceae, in Flora Malasiana (Van Steenis, C.G.G.J. ed.) Ser. I, Vol. 5, 429-493 pp., Noordhoff-Kolff N.V., Djakarta.
- Egler, F.E. 1948. The Dispersal and Establishment of Red Mangroves. Rhizophora in Florida. Carib. Forest. 9(4):229-319.
- Foth, H.D. 1984. Fundamental of Soil Science. 7th. Ed. John Wiley & Sons, Inc. USA. 433 pp.
- Gajaseni, J. 1982. Ecological Study on Comparison of Animal between Disturbed Mangrove and Natural Mangrove. Complete paper presented to National Research Board. (in Thai)
- Giglioli, M.E.C. and Thornton, I. 1965. The Mangrove Swamp of Keneba, Lower Cambia River Basin. II. Surphur and pH in the Profiles of Swamp Soils. J. App. Ecol. 3:257-269.
- Gledhill, D. 1963. The Ecology of Aberdeen Creek Mangrove Swamp. J. Ecol. 51:639-703.

- Hatheway, W.H. 1953. The Land Vegetation of Arno Atoll, Marshall Islands. Atoll Res. Bull. No. 16, 1-65 pp.
- Havanond, S. and A. Ratanavirakul. 1991. Some Mangrove Species Planting Technique. Paper presented on the seventh national seminar on mangrove ecology. 22-25 July. p IV-1: 1-10. (in Thai).
- . and P. Tanapermpool. 1991. The suitable Time to Storage Mangrove Seedling. Paper presented on the seventh national seminar on mangrove ecology. 22-25 July. p IV-9: 1-10. (in Thai).
- Hesse, P.R. 1961. Some Differences Between the Soils of *Rhizophora* and *Avicennia* Mangrove Swamps in Sierra Leone. Plant and soil. 14 : 335-346.
- Hungspreugs, M. 1987. Chemical Oceanography. 1st. Ed. Chulalongkorn University Press, Bangkok. 329 pp. (in Thai)
- Jackson, M.L. 1973. Soil Chemical Analysis. Prentice Hall of India. Private Ltd. New Delhi.
- Jordan, H.D. 1964. The Relation of Vegetation and Soil to The Development of Mangrove Swamps for Rice Growing in Sierra Leone. J. Appl. Ecol. 1:209-212
- Koasirikul, P. 1975. Seasonal and Dially Dynamics in some Pelagic Larvae of Benthic Invertibrate Benthic at Ang Sila, Chonburi Province. Master of Science Thesis, Department of Marine Science, Chulalongkorn University. 103 pp.

- Komkris, T. 1993. The Structure of Mangrove Plant. Chalongrat Press, Bangkok. 151 pp.
- Klankamsorn, B. and T. Jarrupat. 1982. Study on mangrove area in Thailand from the remote sensing imageries. Research report. Department of Forestry, 138 pp.
- Klankamsorn, B. 1991. Survey Study on The Land Govern in Mangrove Forest. Paper presented on second Forum for Annual Reporting on Environment. 15-16 June. 237-266 pp. (in Thai)
- Kogo, M. 1988. Storage of The Viviparous seed of *Rhizophora stylosa*. Paper presented on the sixth national seminar on mangrove ecology. 31 August. 111-118 pp.
- Kongsangchai, J. 1974. Some Soil Properties and Vegetation on Mangrove Forest at Different Tidal Zone at Pang-nga. Master of Science Thesis, Kasetsart University. 219 pp.
- . 1990. The Mangrove Situation of Thailand. Paper presented on second Forum for Annual Reporting on Environment. 15-16 June. 85-92 pp. (in Thai).
- , S. Havanond and P. Tanapermpool. 1991. Productivity of Mangrove Forest Plantation in Thailand. Paper presented on the seventh national seminar on mangrove ecology. 22-25 July. 25 July. p IV-3: 1-22. (in Thai).
- Kongsangdow, T. B. Koocha and N. Komasatit. 1988. Trial on Mangrove Forest Improvement by Pioneer Species. Paper presented on the sixth national seminar on mangrove ecology. 29- 31 August. 212-224 pp. (in Thai).

- Macnae, W. and Kalk, M. 1962. The Ecology of Mangrove Swamps fo
Inhaca Island, Mocambique. J. Ecol. 50:19-34.
- MacNae, W. 1963. Mangrove swamps in South Africa. J. Ecol. 51:1-25.
- . 1968. A General Account of The Fauna and Flora of
Mangrove Swamps and Forest in The Indo-West-Pacific
Region. Adv. Mar. Biol. 6:73-269.
- Menasveta, P. 1991. The Aquaculture Development and Environmental
Problem. Paper presented on second Forum for Annual
Reporting on Environment. 15-16 June. 78-81. (in Thai).
- Miyawaki, A., K. Fujiwara, S. Okuda, K. Suzuki, K. Ohno,
Y. Nakamura, Y. Murakami and S. Aksornkoe. 1985. Human
Impact on The Mangrove Forest and The Potential Natural
Vegetation of Thailand. Study on The Mangrove Ecosystem.
NODAI RESEARCH TNSSTITUTE TOKYO UNIVERSITY OF AGRICULTURE.
August, 1985. 13-22 pp.
- Moordee, R. 1992. Impact and Industrial Management on Tiger Prawn
Culture for Environmental Development of East Coast of
Thailand. Paper presented on the new way to environmental
development: Eastern part. 6-7 May. Natikul Press, Bangkok.
45-61 pp. (in Thai).
- Motohiko, K. 1992. Turning the desert green. The Forefront of The
Environmental Movement in Japan. Ministry of Foreign Affair
Japan (Hino Takeko(ed.)). 12(1992).
- Moul, E. T. 1957. Preliminary Report on the Flora of Onotoa Atoll.
Atoll Res. Bull. NO. 57.

- Muromo, R., S. Laoprasert and C. Karujanagesorn. 1985. Plankton and Near-Bottom Communities at The Mangrove Region in Oh Lkueng Kraben and The Chantaburi River, Thailand. Mangrove Esturine Ecology in Thailand. Thai-Japanese Cooperation Research Project on Mangrove Productivity and Development, 1983-1984. 55-76 pp.
- Naiyanetr, P. 1988. Some Crustacean in Area of Mangrove Forest Research Center, Ranong. Paper presented on the sixth national seminar on mangrove ecology. 29 - 31 August. 251-254 pp. (in Thai).
- Nakasuga, T. 1982. Preliminary Studied on Viviparous Seed and Early Growth of *Rhizophora stylosa* in Okinawa. Proc. of the NRCT-JSPS Rattanakosin Bicentennial Joint Seminar on Science and Mangrove Resources. 2-6 August. Phuket, Thailand. 202-208 pp.
- Narongrit, C. 1992. Impac of Shrimp Farming on Mangrove soil properties, Changwat Suratthani. Master of Science Thesis, Environmental Science, Kasetsart University. 165 pp. (in Thai).
- Panichsuko, S. 1984. Study on Growth of *Rhizophora apiculata*(Thai) and *Rhizophora styrosa* (Japanese). Report of The Fifth National Seminar on Mangrove Ecology, NCRT(in print).
- Paphavasit, N. 1991. Impact of Decay Mangrove on small-scaled fisheries. Journal of Population. No. 7(1):37-45.(in Thai).

- Patanaponpaiboon, P. 1989. Eco-physiological study of plant density effect of experimental mangrove stands of *Kandelia candel* and *Rhizophora apiculata*. United Graduate School, Ehime University, Japan. 148 pp.
- . 1991. Environmental Factors Affecting The Growth of Mangrove Vegetation. Department of Botany, Chulalongkorn University. 10pp. (in Thai).
- Pornpattimakorn, S. 1979. Analysis of ecological parameters and the evaluation on biomass of *R. mucronata* in mangrove forest, Laem Pak Bear, Pechaburi. The Report of thrid national seminar on mangrove ecology. vol. II. National Research Council, Bangkok. 405-436 pp.
- Rabinowitz, D. 1975. Planting Experiments in Mangrove Swamps of Panama. Proceeding of The International Symposium on Biology and Management of Mangrove. Volume I. Institute of Food and Agriculture Science, University of Florida. 385-393 pp.
- Report on Mangrove Situation of Thailand. 1991. Appendix of The Report of seventh national seminar on mangrove ecology. 22-25 July. 25 July. (in Thai).
- Sasekumar, A. 1973. Distribution of Macrofauna on Malayan Mangrove Shore. J. of Animal Ecology. 43(1):51-69.

- Sidhu, S.S. 1975. Culture and Growth of Some Mangrove Species. Proceeding of The International Symposium on Biology and Management of Mangrove. Volume I. Institute of Food and Agriculture Science, University of Florida. 394-401 pp.
- Smith, T.J. III. 1987. Effect of light and Intertidal Position on Seedling Survival and Growth in Tropical Tidal Forests. Exp. Mar. Biol. Ecol. 110,133-146.
- Soitongcome, P. and W. Chunvarin. 1988. Tanin Extraction from *Rhizophora*'s Bark for Retanning. Paper presented on the sixth national seminar on mangrove ecology. 29- 31 August. 144-156 pp. (in Thai).
- Soontrae, P. 1978. Distribution, Growth and Survival of Mangrove Seedling at Amphoe Klung, Changwat Chantaburi. Master of Science Thesis, Kasetsart University. 56 pp.(in Thai).
- Srisawasdi, W. 1982. A Comparison of Growth Development of Five Mangrove Species Planted on an Abandoned Mining Area in Phang-nga(Thailand). Symposium on Mangrove Forest Ecosystem Productivity in Southeast Asia. Biotrop Special Publication No.17. 77-82 pp.
- . 1985. Study on correlation between diameter at breast height, height and crown diameter of *C. tagal* at Phuket. NCRT, Bangkok. 33pp.

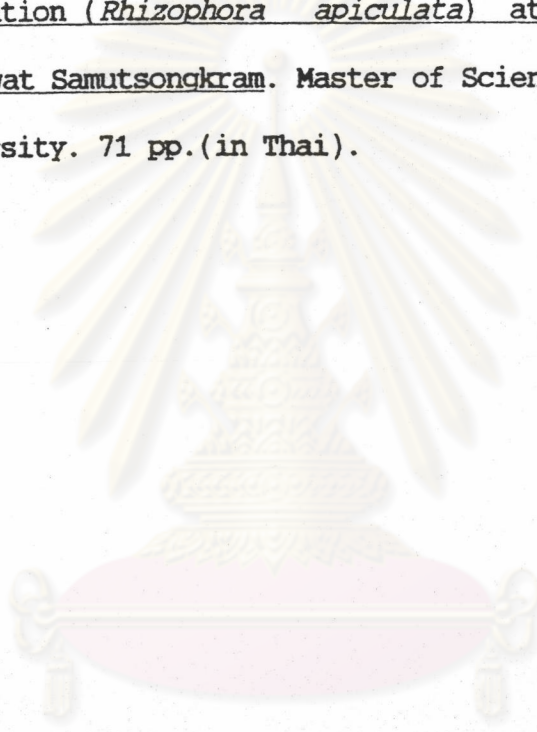
- Srisawasdi, W. 1991. Study on Three Mangrove Tree Species Planted on Mud Flat. Paper presented on the seventh national seminar on mangrove ecology. 22-25 July. 25 July. p IV-2: 1-12. (in Thai).
- Steenis, C.G.G.J. 1958. Rhizophoraceae, in Flora Malasiana vol. 5 431-493 pp.
- Strickland, J.D.H. and T. R. Parson. 1972. A Practical Handbook of Seawater Analysis. Fisheries Research Board of Canada, Ottawa, Canada. 45pp.
- Suksileung, P. 1981. Mangrove Plantation Production in Cutting Strip at Trad Province. Sri Racha Regional Forest Office, Royal Forest Report. 7 pp.
- Suvapepan, S., P. Sripayatt and V. Vichienvorakul. 1979. Zooplankton in natural mangrove forest. A Paper presented on the third national seminar on mangrove ecology. 8-12 April. 389-393 pp. (in Thai).
- Suwansri, S., J. Gajaseni and N. Ajchariyavanich. 1988. Nutrient Budgets in a Natural Mangrove and a Disturbed Mangrove Ecosystem. Paper presented on the sixth national seminar on mangrove ecology. 29-31 August. 225-236 pp. (in Thai).
- Tameyavanich, T. 1984. Research study of water and aquatic resources in water course of Thailand. The Third Seminar. National Research Council of Thailand. 26-28 March. 254-257 pp.

- Tanapermpool, P. 1989. Productivity of *Rhizophora apiculata* Blume. Plantation in Changwat Pattani. Master of Science Thesis, Kasetsart University. 58 pp.(in Thai).
- Tantipukanont, S. and N. Paphavasit. 1991. Zooplankton Compositions and Abundances in the Converted Mangrove Area to Shrimp Farms in The Ang Sila Area, Chonburi Province. Paper presented on the seventh national seminar on mangrove ecology. 22-25 July. 25 July. p. V-4: 1-16. (in Thai).
- Teratanatorn, V. 1988. Growth and Survival of Mangrove Species Planted on The Area of Mining at Amphoe Takua Pa, Changwat Phangnga. Master of Science Thesis, Kasetsart University. 73 pp. (in Thai).
- Thom, B.G. 1967. Mangrove Ecology and Deltaic Geomorphology : Tabasco, Mexico. J. Ecol. 55:301-343.
- Toepakngam, B., S. Aksornkoae and M. Hikagi. 1991. Study on Mangrove Plantation in Saline Soil in Eastern Part of Thailand. Paper presented on the seventh national seminar on mangrove ecology. 22-25 July. 25 July. p. V-4: 1-16. (in Thai).
- Tomlinson, T.R. 1957. Relation Between Mangrove Vegetation, soil Texture And Reaction of Surface Soil After Empaldering Saline Swamps in Sierra Leone. Trop. Agric. Trinidad. 34:108-118.
- Ubolcholaket, A. 1986. Mangrove Communities. Journal of Graduate School, Chulalongkorn University. No.7:21-33. (in Thai).

- UNDP/UNESCO Regional Mangrove Project RAS/86/120. 1992. Final report of the Intergrated Multidisciplinary Survey and Research Programme of the Ranong Mangrove Ecosystem. D.J. Macintosh, S. Aksornkoae, M. Vannucci, C.D. Field, B.F. Clough, B. Kjerfue, N. Paphavasit and K. Wattayakorn (editor). 183 pp.
- USDA. 1967. Soil Laboratory Method and Procedures for Collecting soil sample. Soil Surv. Invest. Rep. No.I. Soil Conservation Services. 63 pp.
- Wacharotayan S., T. Uttanan and S. Kratapirom. 1988. The Handbook of Soil And Water Analysis. Department of Soil Science, Kasetsart University. 34 pp. (in Thai).
- Walsh, G.E. 1967. An Ecological Study of a Hawaiian Mangrove Swamp. in Estauries. (Lauff, G.H. ed.). AAAS Publ. No. 83, Washington. 420-431 pp.
- . 1974. Mangrove : A Reveiw in Ecology of Halophytes. (Reimold, R.J. and Queen, W.H. eds.). Academic Press, New York. 51-174 pp.
- Watson, J.G. 1928. Mangrove Forests of the Malay Peninsula. Malay. For. Rec. 6:1-275.
- Wattanachai, S. 1979. Species Compositions and Abandances of Fish Eggs and Fish Larvae in Mangrpove Forest at Laem Pakbeer, Changwat Pechaburi. Paper presented on the third national seminar on mangrove ecology. 8-12 April. (in Thai).

Wattayakorn, K. ; P. Prapong and J. Kromnoi. 1993. Distribution of nutrients in mangrove forest at Pang-nga Province. The Eighth National Seminar on Mangrove Ecology : Sustainable Mangrove Resources Management. 25-28 Aug. vol. II, IV-8, 1-18 pp.

Wechakit, D. 1987. Growth and Survival of Private Mangrove Plantation (*Rhizophora apiculata*) at Amphoe Amphawa, Changwat Samutsonkram. Master of Science Thesis, Kasetsart University. 71 pp.(in Thai).



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Height growth of *R. apiculata* (plot 1)

	Feb.,93	Apr.,93	Jun.,93	Aug.,93	Oct.,93	Dec.,93	Feb.,94
A2	0.00	12.90	13.40	19.90	23.90	27.90	D
A5	0.00	13.50	24.50	33.50	41.50	48.50	55.50
A6	0.00	18.00	33.50	42.00	50.50	59.50	65.00
A10	0.00	0.00	10.50	19.50	25.50	25.60	D
B2	0.00	17.50	24.00	31.00	36.00	45.00	52.00
B4	0.00	D	D	D	D	D	D
B6	0.00	8.50	14.50	22.50	30.00	30.50	D
B8	0.00	13.50	19.00	25.50	27.60	37.60	42.00
B9	0.00	4.50	18.50	23.50	29.50	37.50	42.50
B10	0.00	9.00	20.00	27.00	32.00	39.50	43.00
C3	0.00	17.00	26.50	37.50	41.30	55.50	59.50
C4	0.00	6.50	8.50	21.50	28.20	39.50	42.50
C6	0.00	15.00	28.50	38.00	43.00	49.00	57.00
C7	0.00	D	D	D	D	D	D
C8	0.00	6.50	16.50	22.00	25.00	32.50	38.50
C9	0.00	D	D	D	D	D	D
D2	0.00	4.50	11.00	24.00	29.00	38.50	46.00
D4	0.00	5.00	D	D	D	D	D
D7	0.00	5.50	11.00	18.50	22.00	27.50	38.00
D8	0.00	3.50	5.00	7.00	9.00	D	D
D9	0.00	3.50	12.00	20.00	25.50	29.50	D
E3	0.00	8.00	18.50	27.00	30.00	40.30	46.00
E5	0.00	6.00	9.50	21.00	24.50	33.00	39.00
E6	0.00	11.00	19.00	30.50	33.50	47.20	53.00
E7	0.00	3.50	13.00	17.50	19.50	24.80	30.00
E10	0.00	10.00	16.00	24.50	28.00	33.00	39.00
F1	0.00	9.50	17.00	27.50	31.20	45.30	51.00
F2	0.00	19.00	30.00	36.00	40.00	44.40	50.00
F3	0.00	12.50	23.00	33.00	37.00	47.00	53.00
F5	0.00	8.00	12.00	16.00	18.00	D	D
F6	0.00	8.00	19.50	26.00	28.20	33.30	37.00
F7	0.00	10.50	20.00	33.50	37.80	41.70	47.50
G1	0.00	D	D	D	D	D	D
G3	0.00	7.00	19.00	27.50	34.00	40.10	45.00
G6	0.00	5.00	17.00	28.50	26.00	41.70	47.00
G7	0.00	10.50	15.50	26.50	33.00	40.50	46.50
G9	0.00	12.50	19.50	31.50	35.50	44.60	53.50
H2	0.00	10.50	22.00	35.00	38.00	50.30	55.00
H4	0.00	7.30	17.60	24.80	25.80	34.20	41.80
H5	0.00	7.50	16.50	24.00	25.30	26.00	26.00
H8	0.00	5.50	17.50	22.50	28.50	32.10	35.50
H9	0.00	5.00	17.00	28.50	32.50	39.50	43.50
I1	0.00	10.00	20.50	28.50	31.50	42.00	44.50
I3	0.00	13.50	22.50	32.00	36.00	44.50	48.50
I6	0.00	D	D	D	D	D	D
I9	0.00	7.00	18.00	26.00	26.60	29.70	34.00
J2	0.00	4.00	11.00	15.00	17.00	D	D
J5	0.00	5.00	17.50	24.50	26.50	28.70	31.50
J7	0.00	D	D	D	D	D	D
J10	0.00	11.50	23.50	35.00	39.50	52.90	57.00

D - DEATH

Height growth of *R. apiculata* (plot 2)

	Feb.,93	Apr.,93	Jun.,93	Aug.,93	Oct.,93	Dec.,93	Feb.,94
A2	0.00	12.50	23.70	33.50	38.00	53.50	58.50
A5	0.00	10.50	27.50	35.00	37.30	44.00	49.00
A6	0.00	7.50	24.40	31.00	35.00	39.20	43.00
A10	0.00	11.50	22.00	31.00	33.00	37.30	44.00
B2	0.00	13.90	23.90	31.40	33.00	37.40	40.40
B4	0.00	11.40	20.40	27.90	28.40	34.40	36.90
B6	0.00	6.50	21.50	27.50	31.60	37.30	41.50
B8	0.00	5.30	24.30	27.30	33.00	35.30	36.30
B9	0.00	2.20	24.70	26.20	28.20	30.20	32.20
B10	0.00	D	D	D	D	D	D
C3	0.00	11.10	19.60	27.60	28.00	35.60	41.60
C4	0.00	3.40	15.40	19.90	23.90	D	D
C6	0.00	8.50	25.00	32.00	34.00	43.00	49.00
C7	0.00	7.90	D	D	D	D	D
C8	0.00	7.20	19.00	26.70	27.70	32.70	41.70
C9	0.00	7.60	19.80	26.60	30.60	34.60	40.60
D2	0.00	D	D	D	D	D	D
D4	0.00	D	D	D	D	D	D
D7	0.00	D	D	D	D	D	D
D8	0.00	5.50	12.00	21.00	27.50	32.00	38.00
D9	0.00	7.00	26.50	32.50	36.00	36.90	46.50
E3	0.00	10.20	26.70	30.70	32.20	33.70	39.70
E5	0.00	14.50	23.30	31.50	31.50	37.50	42.50
E6	0.00	4.00	11.50	19.50	29.20	34.30	41.50
E7	0.00	1.70	D	D	D	D	D
E10	0.00	16.80	26.80	42.80	43.80	51.80	56.80
F1	0.00	1.00	10.30	13.50	13.50	D	D
F2	0.00	0.00	1.00	6.00	6.00	D	D
F3	0.00	12.00	23.70	34.50	40.50	46.50	53.50
F5	0.00	10.50	11.50	31.50	35.00	40.50	46.50
F6	0.00	7.00	21.10	27.50	29.50	D	D
F7	0.00	1.90	D	D	D	D	D
G1	0.00	9.10	17.60	24.60	31.60	37.60	42.60
G3	0.00	15.10	30.30	35.10	39.60	49.60	56.10
G6	0.00	7.50	7.50	10.50	11.50	D	D
G7	0.00	1.30	D	D	D	D	D
G9	0.00	2.80	15.40	22.80	25.80	D	D
H2	0.00	9.40	25.60	32.90	34.90	39.40	46.40
H4	0.00	3.50	D	D	D	D	D
H5	0.00	11.80	16.80	26.30	27.20	34.80	42.30
H8	0.00	2.20	D	D	D	D	D
H9	0.00	5.60	20.60	26.10	27.60	D	D
I1	0.00	2.30	D	D	D	D	D
I3	0.00	7.00	24.20	30.30	34.00	43.50	47.00
I6	0.00	13.10	28.60	33.20	32.10	37.60	44.60
I9	0.00	8.50	26.40	D	D	D	D
J2	0.00	10.00	20.80	26.00	28.50	30.50	32.50
J5	0.00	9.30	20.70	26.80	D	D	D
J7	0.00	9.30	12.30	17.30	D	D	D
J10	0.00	7.50	10.50	11.50	16.20	D	D

D - DEATH

Height growth of *R. apiculata* (plot 3)

	Feb.,93	Apr.,93	Jun.,93	Aug.,93	Oct.,93	Dec.,93	Feb.,94
A2	0.00	4.50	18.00	24.00	26.00	29.40	34.00
A5	0.00	3.00	D	D	D	D	D
A6	0.00	5.50	22.10	28.50	33.50	42.50	49.50
A10	0.00	11.00	20.40	22.50	26.00	27.00	32.00
B2	0.00	D	D	D	D	D	D
B4	0.00	3.50	10.50	11.00	13.00	14.70	17.50
B6	0.00	D	D	D	D	D	D
B8	0.00	6.50	15.00	25.00	28.20	37.80	40.00
B9	0.00	0.00	9.50	14.00	20.00	24.00	D
B10	0.00	12.00	27.30	32.00	34.80	47.60	53.00
C3	0.00	4.00	21.50	28.50	30.90	31.00	32.50
C4	0.00	16.90	24.90	30.40	36.40	42.40	51.40
C6	0.00	1.50	D	D	D	D	D
C7	0.00	12.00	26.80	35.00	41.00	54.20	62.00
C8	0.00	10.50	21.70	32.50	33.30	43.50	51.50
C9	0.00	10.80	26.00	27.00	35.00	42.00	46.00
D2	0.00	13.50	20.60	26.00	27.30	32.00	35.00
D4	0.00	D	D	D	D	D	D
D7	0.00	7.00	19.50	25.00	29.60	37.00	42.00
D8	0.00	3.50	D	D	D	D	D
D9	0.00	10.30	25.30	31.80	35.30	41.30	46.80
E3	0.00	13.50	24.00	31.50	35.50	46.60	56.50
E5	0.00	4.00	D	D	D	D	D
E6	0.00	7.80	20.80	27.30	29.80	41.00	48.80
E7	0.00	15.30	24.80	37.80	43.00	56.80	66.80
E10	0.00	13.00	20.50	29.00	32.00	40.60	51.00
F1	0.00	5.90	21.00	29.90	33.90	44.00	47.90
F2	0.00	7.20	14.60	16.70	22.50	D	D
F3	0.00	8.60	11.60	13.60	18.40	D	D
F5	0.00	9.70	19.70	23.70	29.80	36.10	43.70
F6	0.00	2.50	5.50	11.50	16.80	D	D
F7	0.00	17.00	33.10	42.50	48.50	58.50	63.50
G1	0.00	15.80	34.60	40.30	43.80	44.00	45.80
G3	0.00	13.00	26.30	28.50	31.50	38.30	41.50
G6	0.00	14.20	27.20	36.70	43.70	55.90	62.70
G7	0.00	16.00	29.50	37.50	41.70	54.50	59.50
G9	0.00	10.50	24.00	33.50	38.50	42.80	50.50
H2	0.00	12.00	28.00	34.00	38.50	45.50	51.50
H4	0.00	16.30	28.30	31.30	35.50	41.50	48.30
H5	0.00	9.80	25.30	29.30	33.50	42.60	48.30
H8	0.00	12.70	25.20	33.70	37.50	41.70	50.70
H9	0.00	11.30	22.40	29.80	29.80	33.40	41.80
I1	0.00	14.50	20.50	35.00	37.60	46.00	54.00
I3	0.00	17.40	17.90	24.40	25.20	D	D
I6	0.00	15.50	26.00	33.00	39.00	49.50	55.50
I9	0.00	12.20	18.00	34.50	40.20	49.00	58.00
J2	0.00	2.00	D	D	D	D	D
J5	0.00	9.80	20.10	24.30	29.30	32.30	35.30
J7	0.00	6.80	14.30	19.80	26.80	36.30	44.30
J10	0.00	9.80	14.80	21.80	25.80	D	D

D - DEATH

Height growth of *B. gymnorhiza* (plot 1)

	Feb.,93	Apr.,93	Jun.,93	Aug.,93	Oct.,93	Dec.,93	Feb.,94
A2	0.00	3.2	26.40	30.90	31.90	37.90	40.90
A5	0.00	D	D	D	D	D	D
A6	0.00	D	D	D	D	D	D
A10	0.00	2.5	21.50	26.30	26.50	28.50	30.50
B2	0.00	4.2	28.10	37.60	41.60	48.60	49.60
B4	0.00	D	D	D	D	D	D
B6	0.00	10.0	32.00	37.10	42.00	48.80	51.00
B8	0.00	12.5	27.80	34.40	31.00	39.20	44.00
B9	0.00	12.5	22.10	35.90	36.10	36.10	43.60
B10	0.00	D	D	D	D	D	D
C3	0.00	1.0	28.60	37.30	40.40	41.00	47.00
C4	0.00	1.0	D	D	D	D	D
C6	0.00	12.0	27.50	32.00	34.60	38.50	46.00
C7	0.00	7.0	23.20	31.50	36.00	50.00	50.00
C8	0.00	1.0	25.10	31.00	35.00	38.70	D
C9	0.00	12.5	27.40	36.00	38.00	39.00	43.00
D2	0.00	17.0	31.10	39.80	42.00	44.40	48.00
D4	0.00	7.0	28.30	32.00	33.00	37.80	39.00
D7	0.00	7.0	25.30	32.00	32.80	36.50	37.00
D8	0.00	0.0	29.20	34.30	35.50	40.00	D
D9	0.00	0.0	22.50	29.80	31.50	36.50	40.50
E3	0.00	13.0	26.50	33.20	34.60	35.50	39.00
E5	0.00	1.0	D	D	D	D	D
E6	0.00	0.0	31.50	38.50	43.50	46.50	D
E7	0.00	2.0	19.00	25.60	29.00	32.50	38.00
E10	0.00	6.5	27.30	36.20	37.00	37.00	D
F1	0.00	D	D	D	D	D	D
F2	0.00	D	D	D	D	D	D
F3	0.00	2.5	33.00	40.00	43.00	46.10	51.00
F5	0.00	3.0	20.00	25.00	25.00	27.70	D
F6	0.00	0.0	25.30	33.00	37.00	41.80	46.00
F7	0.00	0.0	29.20	32.60	36.00	39.00	D
G1	0.00	12.5	D	D	D	D	D
G3	0.00	13.0	29.40	35.50	39.50	42.80	46.00
G6	0.00	5.0	24.00	32.30	33.00	35.00	D
G7	0.00	7.0	33.30	37.00	39.00	40.00	41.00
G9	0.00	6.5	29.00	36.00	36.00	37.00	D
H2	0.00	7.0	26.00	30.00	34.00	38.50	39.00
H4	0.00	5.5	26.30	30.00	32.00	36.00	D
H5	0.00	D	D	D	D	D	D
H8	0.00	4.0	27.30	31.50	36.00	39.40	42.00
H9	0.00	6.5	27.50	33.80	36.70	42.50	48.50
I1	0.00	13.0	24.60	29.50	38.00	40.30	48.00
I3	0.00	10.0	D	D	D	D	D
I6	0.00	7.5	30.50	39.50	40.80	43.50	48.50
I9	0.00	5.5	27.40	37.50	39.00	39.60	D
J2	0.00	7.0	D	D	D	D	D
J5	0.00	10.5	28.80	34.00	34.00	35.80	D
J7	0.00	5.0	30.80	36.00	36.00	39.80	43.00
J10	0.00	D	D	D	D	D	D

D - DEATH

Height growth of *B. gymnorhiza* (plot 2)

	Feb.,93	Apr.,93	Jun.,93	Aug.,93	Oct.,93	Dec.,93	Feb.,94
A2	0.00	12.00	30.00	34.60	35.50	40.00	D
A5	0.00	D	D	D	D	D	D
A6	0.00	4.00	30.00	35.80	36.60	45.00	D
A10	0.00	6.00	24.50	33.20	46.30	47.00	D
B2	0.00	4.00	21.00	25.50	29.60	32.40	D
B4	0.00	13.50	28.50	36.00	38.50	42.50	47.00
B6	0.00	2.50	D	D	D	D	D
B8	0.00	14.50	14.50	18.50	30.00	33.70	D
B9	0.00	D	D	D	D	D	D
B10	0.00	D	D	D	D	D	D
C3	0.00	24.00	32.10	42.00	47.00	47.20	50.00
C4	0.00	21.00	35.00	43.80	47.10	49.10	53.00
C6	0.00	D	D	D	D	D	D
C7	0.00	11.00	19.50	27.00	28.10	32.00	D
C8	0.00	7.50	D	D	D	D	D
C9	0.00	D	D	D	D	D	D
D2	0.00	D	D	D	D	D	D
D4	0.00	0.00	0.00	0.00	13.50	31.00	35.00
D7	0.00	D	D	D	D	D	D
D8	0.00	D	D	D	D	D	D
D9	0.00	10.00	28.40	36.00	39.30	44.20	D
E3	0.00	2.00	21.00	28.00	31.60	38.00	44.00
E5	0.00	D	D	D	D	D	D
E6	0.00	D	D	D	D	D	D
E7	0.00	D	D	D	D	D	D
E10	0.00	D	D	D	D	D	D
F1	0.00	D	D	D	D	D	D
F2	0.00	D	D	D	D	D	D
F3	0.00	D	D	D	D	D	D
F5	0.00	3.00	D	D	D	D	D
F6	0.00	D	D	D	D	D	D
F7	0.00	D	D	D	D	D	D
G1	0.00	4.00	D	D	D	D	D
G3	0.00	9.50	D	D	D	D	D
G6	0.00	12.50	28.50	34.20	37.00	40.00	44.00
G7	0.00	D	D	D	D	D	D
G9	0.00	13.00	24.30	32.40	44.30	48.70	D
H2	0.00	13.00	22.00	31.40	35.50	39.40	43.00
H4	0.00	2.00	D	D	D	D	D
H5	0.00	15.50	23.00	30.40	33.00	33.60	35.00
H8	0.00	D	D	D	D	D	D
H9	0.00	5.00	D	D	D	D	D
I1	0.00	11.50	22.50	31.50	44.00	44.30	45.00
I3	0.00	12.00	23.00	32.80	45.90	48.50	48.50
I6	0.00	4.50	31.50	38.50	43.00	47.00	52.00
I9	0.00	4.00	D	D	D	D	D
J2	0.00	D	D	D	D	D	D
J5	0.00	10.50	21.80	28.00	28.60	29.00	D
J7	0.00	D	D	D	D	D	D
J10	0.00	2.00	D	D	D	D	D

D - DEATH

Height growth of *B. gymnorhiza* (plot 3)

	Feb.,93	Apr.,93	Jun.,93	Aug.,93	Oct.,93	Dec.,93	Feb.,94
A2	0.00	15.00	24.50	28.00	29.50	32.50	D
A5	0.00	17.00	34.80	35.00	41.40	45.00	48.00
A6	0.00	20.50	32.00	36.50	41.50	42.50	43.50
A10	0.00	D	D	D	D	D	D
B2	0.00	13.00	36.30	38.50	42.90	48.50	52.50
B4	0.00	20.00	30.20	32.00	37.00	D	D
B6	0.00	15.50	25.80	31.00	37.10	38.00	D
B8	0.00	D	D	D	D	D	D
B9	0.00	D	D	D	D	D	D
B10	0.00	19.50	36.00	41.00	45.60	49.00	50.00
C3	0.00	18.50	34.00	35.50	39.50	40.50	43.50
C4	0.00	9.50	31.80	34.50	36.60	37.00	40.00
C6	0.00	2.00	D	D	D	D	D
C7	0.00	19.00	32.80	34.50	37.70	41.70	45.50
C8	0.00	D	D	D	D	D	D
C9	0.00	D	D	D	D	D	D
D2	0.00	21.30	33.00	38.50	44.00	45.60	48.00
D4	0.00	19.50	20.50	29.00	29.30	31.30	35.50
D7	0.00	13.00	29.80	33.00	37.00	37.00	40.00
D8	0.00	20.00	32.00	36.00	36.50	37.80	41.00
D9	0.00	6.00	23.70	34.50	39.00	41.50	49.50
E3	0.00	D	D	D	D	D	D
E5	0.00	D	D	D	D	D	D
E6	0.00	17.50	32.50	35.50	39.20	47.50	55.50
E7	0.00	14.00	27.00	32.00	34.80	36.00	46.00
E10	0.00	17.50	29.00	31.50	35.70	37.00	48.00
F1	0.00	4.50	D	D	D	D	D
F2	0.00	D	D	D	D	D	D
F3	0.00	18.00	23.60	35.00	39.00	42.00	43.00
F5	0.00	19.00	19.80	33.50	38.10	41.70	28.50
F6	0.00	2.50	27.40	30.50	34.50	34.50	40.50
F7	0.00	13.50	31.80	38.00	45.40	49.00	D
G1	0.00	18.50	23.50	38.00	41.00	45.20	41.00
G3	0.00	10.50	24.00	31.00	36.50	42.00	47.50
G6	0.00	16.00	23.50	30.00	33.00	34.00	51.00
G7	0.00	14.00	29.00	32.50	34.00	D	D
G9	0.00	14.00	30.10	32.50	37.50	37.80	D
H2	0.00	2.50	D	D	D	D	D
H4	0.00	2.50	D	D	D	D	D
H5	0.00	0.50	12.90	30.50	32.30	36.00	55.50
H8	0.00	D	D	D	D	D	D
H9	0.00	2.00	D	D	D	D	D
I1	0.00	1.50	D	D	D	D	D
I3	0.00	7.50	25.00	33.00	35.60	38.60	D
I6	0.00	11.00	27.80	31.00	34.00	36.00	D
I9	0.00	2.00	22.50	22.50	25.30	28.50	D
J2	0.00	17.00	28.00	35.00	36.20	36.60	D
J5	0.00	D	D	D	D	D	D
J7	0.00	11.00	20.00	29.00	45.80	48.40	56.00
J10	0.00	1.50	D	D	D	D	D

D - DEATH

Height growth of *C. tagal* (plot 1)

	Feb.,93	Apr.,93	Jun.,93	Aug.,93	Oct.,93	Dec.,93	Feb.,94
A2	0.00	D	D	D	D	D	D
A5	0.00	D	D	D	D	D	D
A6	0.00	4.00	7.20	10.00	11.00	11.60	D
A10	0.00	1.80	1.80	D	D	D	D
B2	0.00	1.50	3.00	4.00	D	D	D
B4	0.00	2.20	4.70	7.20	8.20	D	D
B6	0.00	4.00	2.00	4.80	8.00	8.00	D
B8	0.00	2.20	D	D	D	D	D
B9	0.00	3.60	4.10	4.10	D	D	D
B10	0.00	2.00	D	D	D	D	D
C3	0.00	1.30	5.30	6.30	7.30	9.30	D
C4	0.00	2.50	6.30	8.50	13.50	13.50	D
C6	0.00	2.80	3.30	5.30	6.10	D	D
C7	0.00	1.20	6.20	D	D	D	D
C8	0.00	D	D	D	D	D	D
C9	0.00	D	D	D	D	D	D
D2	0.00	3.70	4.70	7.20	7.20	D	D
D4	0.00	2.80	5.30	7.80	17.30	D	D
D7	0.00	2.00	D	D	D	D	D
D8	0.00	D	D	D	D	D	D
D9	0.00	D	D	D	D	D	D
E3	0.00	6.70	6.70	7.30	7.50	D	D
E5	0.00	3.10	D	D	D	D	D
E6	0.00	D	D	D	D	D	D
E7	0.00	4.80	4.80	D	D	D	D
E10	0.00	3.00	D	D	D	D	D
F1	0.00	2.90	3.40	3.90	D	D	D
F2	0.00	D	D	D	D	D	D
F3	0.00	1.90	D	D	D	D	D
F5	0.00	2.60	D	D	D	D	D
F6	0.00	D	D	D	D	D	D
F7	0.00	D	D	D	D	D	D
G1	0.00	2.90	D	D	D	D	D
G3	0.00	6.70	14.70	15.70	20.90	D	D
G6	0.00	2.50	2.50	D	D	D	D
G7	0.00	5.00	D	D	D	D	D
G9	0.00	D	D	D	D	D	D
H2	0.00	1.80	D	D	D	D	D
H4	0.00	1.50	1.50	D	D	D	D
H5	0.00	D	D	D	D	D	D
H8	0.00	2.00	D	D	D	D	D
H9	0.00	3.50	D	D	D	D	D
I1	0.00	2.00	6.00	7.80	8.20	D	D
I3	0.00	2.10	D	D	D	D	D
I6	0.00	3.00	D	D	D	D	D
I9	0.00	2.00	D	D	D	D	D
J2	0.00	2.50	11.00	12.30	D	D	D
J5	0.00	2.60	D	D	D	D	D
J7	0.00	1.40	D	D	D	D	D
J10	0.00						

D - DEATH

Height growth of *C. tagal* (plot 3)

	Feb.,93	Apr.,93	Jun.,93	Aug.,93	Oct.,93	Dec.,93	Feb.,94	
A2	0.00	0.00		5.50	6.50	10.50	11.00	D
A5	0.00	1.50		6.50	7.50	14.00	14.50	D
A6	0.00	1.50		3.50	4.00	5.80	6.00	D
A10	0.00	1.00		2.50	4.00	9.00	9.00	D
B2	0.00	0.50		7.30	8.50	12.50	12.50	D
B4	0.00	0.50		9.70	10.50	16.00	16.50	D
B6	0.00	1.50		3.50	5.00	12.90	14.30	D
B8	0.00	D	D	D	D	D	D	D
B9	0.00	0.00		5.00	7.00	16.50	16.60	D
B10	0.00	0.00		2.50	5.00	11.00	12.00	D
C3	0.00	D	D	D	D	D	D	D
C4	0.00	0.00		4.00	5.50	9.40	11.00	D
C6	0.00	1.00		6.00	6.50	11.70	16.50	D
C7	0.00	1.50		5.00	7.00	8.50	10.00	D
C8	0.00	0.00		2.50	5.50	10.50	10.50	D
C9	0.00	0.50		6.00	8.50	15.50	16.50	D
D2	0.00	D	D	D	D	D	D	D
D4	0.00	3.50		4.60	9.50	13.00	13.50	D
D7	0.00	2.50		4.60	9.50	11.10	15.50	D
D8	0.00	2.00		5.00	9.50	10.10	16.90	D
D9	0.00	0.00		1.50	2.00	4.90	5.00	D
E3	0.00	D	D	D	D	D	D	D
E5	0.00	D	D	D	D	D	D	D
E6	0.00	0.00		4.30	6.00	7.00	13.00	D
E7	0.00	2.00		5.40	13.50	15.50	16.50	D
E10	0.00	1.50		2.50	5.50	14.60	14.60	D
F1	0.00	D	D	D	D	D	D	D
F2	0.00	D	D	D	D	D	D	D
F3	0.00	1.00		3.00	4.00	8.00	8.60	D
F5	0.00	D	D	D	D	D	D	D
F6	0.00	0.00		4.00	6.00	7.00	10.60	D
F7	0.00	0.00		9.00	12.00	15.00	19.00	D
G1	0.00	D	D	D	D	D	D	D
G3	0.00	D	D	D	D	D	D	D
G6	0.00	3.50		8.60	10.00	15.00	15.00	D
G7	0.00	D	D	D	D	D	D	D
G9	0.00	0.00		7.50	12.00	15.50	17.00	D
H2	0.00	D	D	D	D	D	D	D
H4	0.00	1.50		4.50	9.50	13.70	D	D
H5	0.00	0.00		5.00	10.00	14.00	15.00	D
H8	0.00	1.50		1.50	2.50	4.80	5.50	D
H9	0.00	4.50		4.50	9.50	14.90	15.00	D
I1	0.00	2.50		6.50	6.50	6.80	7.00	D
I3	0.00	0.00		3.50	5.00	7.00	7.20	D
I6	0.00	2.50		5.80	8.00	11.00	12.00	D
I9	0.00	0.00		3.50	4.50	11.50	12.50	D
J2	0.00	D	D	D	D	D	D	D
J5	0.00	D	D	D	D	D	D	D
J7	0.00	2.00		9.00	11.00	13.80	14.00	D
J10	0.00	8.00	D	D	D	D	D	D

D - DEATH

Height growth of *C. tagal* (plot 2)

	Feb.,93	Apr.,93	Jun.,93	Aug.,93	Oct.,93	Dec.,93	Feb.,94
A2	0.00	0.00	0.20	3.00	8.00	D	D
A5	0.00	D	D	D	D	D	D
A6	0.00	0.00	6.00	7.30	9.50	10.00	D
A10	0.00	1.50	D	D	D	D	D
B2	0.00	1.00	D	D	D	D	D
B4	0.00	2.50	4.50	8.80	18.00	18.70	D
B6	0.00	0.00	7.50	11.00	14.00	15.00	D
B8	0.00	0.00	3.50	3.50	D	D	D
B9	0.00	1.50	2.00	6.40	11.60	13.00	D
B10	0.00	0.00	0.00	1.50	6.40	6.50	D
C3	0.00	0.00	1.00	2.00	2.60	3.00	D
C4	0.00	0.00	4.00	10.00	3.00	D	D
C6	0.00	0.00	1.50	3.00	6.50	6.50	D
C7	0.00	0.00	4.00	6.50	10.00	12.50	D
C8	0.00	0.00	4.50	8.50	11.00	11.50	D
C9	0.00	D	D	D	D	D	D
D2	0.00	0.00	0.50	3.00	7.70	8.00	D
D4	0.00	D	D	D	D	D	D
D7	0.00	2.50	3.50	5.50	11.20	11.50	D
D8	0.00	1.00	D	D	D	D	D
D9	0.00	0.00	3.00	5.20	11.50	12.00	D
E3	0.00	D	D	D	D	D	D
E5	0.00	1.50	3.50	7.00	7.50	D	D
E6	0.00	0.00	1.40	2.60	6.10	7.60	D
E7	0.00	0.00	5.80	8.00	9.30	D	D
E10	0.00	0.00	3.10	7.00	10.30	10.50	D
F1	0.00	0.50	3.90	6.10	7.60	D	D
F2	0.00	D	D	D	D	D	D
F3	0.00	D	D	D	D	D	D
F5	0.00	2.50	D	D	D	D	D
F6	0.00	0.00	2.00	5.00	10.60	11.00	D
F7	0.00	D	D	D	D	D	D
G1	0.00	D	D	D	D	D	D
G3	0.00	1.00	7.00	10.00	12.00	12.00	D
G6	0.00	0.50	5.00	6.90	8.90	9.50	D
G7	0.00	2.00	6.30	7.90	8.00	9.50	D
G9	0.00	0.00	4.50	6.00	D	D	D
H2	0.00	0.00	2.50	4.00	D	D	D
H4	0.00	1.50	5.50	5.50	6.00	D	D
H5	0.00	1.00	D	D	D	D	D
H8	0.00	D	D	D	D	D	D
H9	0.00	2.00	D	D	D	D	D
I1	0.00	2.00	D	D	D	D	D
I3	0.00	2.50	D	D	D	D	D
I6	0.00	D	D	D	D	D	D
I9	0.00	1.50	4.80	7.50	8.00	D	D
J2	0.00	D	D	D	D	D	D
J5	0.00	0.70	3.70	5.70	10.70	11.30	D
J7	0.00	D	D	D	D	D	D
J10	0.00	2.00	4.60	6.30	9.00	10.00	D

D - DEATH

Survival of *R. apiculata*

SITE	Feb.,93	Apr.,93	Jun.,93	Aug.,93	Oct.,93	Dec.,93	Feb.,94
plot 1	100.00	89.00	88.00	88.00	87.00	80.00	78.00
plot 2	100.00	92.00	82.00	82.00	81.00	60.00	53.00
plot 3	100.00	92.00	84.00	84.00	84.00	75.00	69.00

Survival of *B. gymnorrhiza*

plot 1	100.00	80.00	71.00	70.00	70.00	70.00	48.00
plot 2	100.00	56.00	42.00	42.00	42.00	39.00	26.00
plot 3	100.00	82.00	65.00	64.00	65.00	62.00	50.00

Survival of *C. tagal*

plot 1	100.00	74.00	57.00	56.00	25.00	5.00	0.00
plot 2	100.00	74.00	57.00	56.00	54.00	44.00	0.00
plot 3	100.00	78.00	64.00	63.00	65.00	58.00	0.00

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

SOIL ANALYSIS IN FEBRUARY, 1993

MANGROVE SEEDLING	SITE	NH ₃ -N (ppm.)	NO ₂ -N (ppm.)	NO ₃ -N (ppm.)	PO ₄ (ppm.)	K (ppm.)	Ca (ppm.)	Mg (ppm.)	Na (ppm.)
R. apiculata	plot 1	2.5935	0.0030	0.0335	3.8190	763.9392	9218.400	729.3000	9234.955
	plot 2	1.4385	0.0038	0.0445	1.9950	725.9233	7615.200	1944.800	9887.382
	plot 3	1.5750	0.0074	0.0907	1.8041	642.2882	7815.600	1337.050	9561.168
B. gymnorrhiza	plot 1	1.6800	0.0033	0.0408	1.3310	649.8914	7815.600	1944.800	10213.59
	plot 2	1.5330	0.0041	0.0556	1.1970	710.7169	8416.400	486.2000	10213.59
	plot 3	1.8165	0.0035	0.0427	2.0891	809.5583	6813.600	2795.650	9561.168
C. tagal	plot 1	2.2785	0.0036	0.0699	3.9900	931.2093	6012.000	1944.800	8256.313
	plot 2	1.6380	0.0039	0.0339	1.1660	718.3201	6212.400	1944.800	10213.59
	plot 3	1.1865	0.0041	0.0367	0.9491	862.7806	8216.400	729.3000	9398.061
MANGROVE SEEDLING	SITE	pH	MOIS.CONT. (%)	SAND (%)	SILT (%)	CLAY (%)			
R. apiculata	plot 1	7.5	133.3333	15.9600	33.2800	50.7600			
	plot 2	7.5	138.4180	13.6000	35.0000	51.4000			
	plot 3	7.5	108.0536	11.6000	34.0000	54.4000			
B. gymnorrhiza	plot 1	7.4	112.1212	15.9600	33.2800	50.7600			
	plot 2	7.4	112.5827	15.6000	32.0000	52.4000			
	plot 3	7.3	141.5584	9.6000	38.0000	52.4000			
C. tagal	plot 1	7.6	141.4507	13.6000	34.0000	52.4000			
	plot 2	7.4	147.8021	12.9600	34.6400	52.4000			
	plot 3	7.4	108.4745	9.6000	34.0000	56.4000			

SOIL ANALYSIS IN JUNE, 1993

MANGROVE SEEDLING	SITE	NH ₃ -N (ppm.)	NO ₂ -N (ppm.)	NO ₃ -N (ppm.)	PO ₄ (ppm.)	K (ppm.)	Ca (ppm.)	Mg (ppm.)	Na (ppm.)
R. apiculata	plot 1	0.2005	0.0006	0.3430	4.2900	1318.971	6348.672	3325.608	9887.382
	plot 2	0.8183	0.0006	0.3706	5.6669	847.5742	3751.488	4900.896	11192.23
	plot 3	1.1615	0.0017	0.3511	3.9021	938.8125	7502.976	2450.448	11029.13
B. gymnorrhiza	plot 1	0.2692	0.0007	0.0745	4.6003	961.6220	8945.856	1400.256	8256.313
	plot 2	0.3912	0.0004	0.0586	2.7967	1075.669	3174.336	4900.896	10539.80
	plot 3	0.8031	0.0007	0.0683	3.8643	1849.867	6637.248	3325.608	11355.34
C. tagal	plot 1	1.1005	0.0011	0.3648	6.8111	961.6220	4328.640	5776.056	11681.55
	plot 2	1.0166	0.0005	0.4428	4.5809	733.5264	6348.672	4375.800	10539.80
	plot 3	0.6963	0.0011	0.1400	3.1846	931.2093	3174.336	5075.928	9561.168
MANGROVE SEEDLING	SITE	pH	MOIS. CONT. (%)	SAND (%)	SILT (%)	CLAY (%)			
R. apiculata	plot 1	6.9	103.7815	13.2400	34.7200	50.0400			
	plot 2	6.9	133.0188	14.3200	31.6400	54.0400			
	plot 3	7.1	126.2734	10.6800	34.2800	54.0400			
B. gymnorrhiza	plot 1	7.5	116.9216	12.3200	35.6400	52.0400			
	plot 2	7.0	121.4532	12.3200	33.6400	54.0400			
	plot 3	7.3	138.7138	11.9600	33.0000	54.0400			
C. tagal	plot 1	7.3	133.9862	13.2400	32.7200	54.0400			
	plot 2	6.9	157.9597	14.3200	31.6400	54.0400			
	plot 3	7.3	107.8276	10.3200	31.6400	58.0400			

SOIL ANALYSIS IN OCTOBER, 1993

MANGROVE SEEDLING	SITE	NH ₃ -N (ppm.)	NO ₂ -N (ppm.)	NO ₃ -N (ppm.)	P ₀₄ (ppm.)	K (ppm.)	Ca (ppm.)	Mg (ppm.)	Na (ppm.)
R. apiculata	plot 1	0.0122	0.0036	0.3653	6.7657	1757.962	8016.000	2431.000	5465.815
	plot 2	1.1412	0.0016	0.3356	4.6058	1704.459	4809.600	3646.500	4927.535
	plot 3	0.9679	0.0006	0.0523	4.1913	1757.962	7615.200	1701.700	5376.071
B. gymnorrhiza	plot 1	0.1312	0.0014	0.3168	8.3363	1722.293	9619.200	1944.800	5017.097
	plot 2	1.0373	0.0010	0.0568	4.5404	1793.631	4809.600	4375.800	5331.200
	plot 3	0.5882	0.0016	0.0696	6.0566	1722.293	8016.000	1944.800	4927.353
C. tagal	plot 1	0.2809	0.0010	0.1898	10.3543	1615.287	4809.600	3646.500	5196.584
	plot 2	1.0917	0.0021	0.2330	8.3145	1436.943	4408.800	3889.600	5286.328
	plot 3	1.3713	0.0018	0.2607	5.0312	1312.102	8016.000	2917.200	5645.302
MANGROVE SEEDLING	SITE	pH	MOIS.CONT. (%)	SAND (%)	SILT (%)	CLAY (%)			
R. apiculata	plot 1	6.8	134.0540	16.3200	30.9200	52.7600			
	plot 2	6.9	117.8571	15.9600	31.2800	52.7600			
	plot 3	6.7	153.0303	9.9600	33.2800	56.7600			
B. gymnorrhiza	plot 1	6.8	94.0541	15.9600	33.2800	50.7600			
	plot 2	7.0	149.6551	15.9600	29.2800	54.7600			
	plot 3	7.0	117.9245	11.9600	36.0000	52.0400			
C. tagal	plot 1	6.9	91.7293	17.9600	31.2800	50.7600			
	plot 2	6.7	111.6883	15.9600	33.2800	50.7600			
	plot 3	7.0	142.7777	7.9600	32.2800	59.7600			

SOIL ANALYSIS IN FEBRUARY, 1994

MANGROVE SEEDLING	SITE	NH3-N (ppm.)	NO2-N (ppm.)	NO3-N (ppm.)	P04 (ppm.)	K (ppm.)	Ca (ppm.)	Mg (ppm.)	Na (ppm.)
R. apiculata	plot 1	3.7776	0.0716	0.1389	4.7324	1536.400	2597.180	10606.93	8584.580
	plot 2	0.3421	0.0196	0.1957	4.3981	1496.170	3895.780	6563.700	7121.893
	plot 3	1.9929	0.0396	0.1363	2.8324	1335.250	4328.640	7351.340	7304.729
B. gymnorrhiza	plot 1	2.0450	0.0166	0.1646	4.4157	1576.630	2597.180	6826.650	6756.221
	plot 2	0.1636	0.0383	0.1710	2.8324	1616.860	4328.640	7613.890	8401.744
	plot 3	3.0563	0.0456	0.3780	3.2546	1657.090	4761.504	8138.990	8584.580
C. tagal	plot 1	2.3499	0.0293	0.2155	3.7472	1616.860	3462.910	8401.540	8301.326
	plot 2	1.1749	0.0396	0.3386	3.8880	1603.580	4761.504	7613.890	8310.326
	plot 3	2.3573	0.0363	0.3362	3.4130	1536.400	4328.640	6826.250	7121.893
MANGROVE SEEDLING	SITE	pH	MOIS.CONT. (%)	SAND (%)	SILT (%)	CLAY (%)			
R. apiculata	plot 1	7.35	62.3100	23.4600	39.5000	37.0400			
	plot 2	7.30	62.2000	23.8200	38.1400	38.0400			
	plot 3	7.30	60.6000	23.8200	38.1400	38.0400			
B. gymnorrhiza	plot 1	7.20	55.2100	21.4600	40.5000	38.0400			
	plot 2	7.20	66.7400	20.7400	41.2200	38.0400			
	plot 3	7.30	64.7500	24.0200	38.2200	37.7600			
C. tagal	plot 1	7.25	59.0500	24.7400	36.5000	38.7600			
	plot 2	7.25	63.4800	24.0200	38.5800	37.4000			
	plot 3	7.20	60.8300	23.0200	39.5800	37.4000			



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

MANGROVE SEEDLING WITH SURVIVAL

*** ANALYSIS OF VARIANCE ***

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	30724.254	8	3840.532	28.408	.000
TYPE	9379.937	2	4689.968	34.692	.000
MONTH	21344.317	6	3557.386	26.314	.000
2-way Interactions	4664.730	12	388.728	2.875	.006
TYPE MONTH	4664.730	12	388.728	2.875	.006
Explained	35388.984	20	1769.449	13.089	.000
Residual	5678.000	42	135.190		
Total	41066.984	62	662.371		

ONEWAY VARIABLE = SUR BY FEB (1,3)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH SURVIVAL

----- ONEWAY -----

Variable SUR
By Variable FEB

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	.0000	.0000		
Within Groups	6	.0000	.0000		
Total	8	.0000			

ONEWAY VARIABLE = SUR BY APR (1,3)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH SURVIVAL

----- O N E W A Y -----

Variable SUR
By Variable APR

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	588.6667	294.3333	4.0567	.0768
Within Groups	6	435.3333	72.5556		
Total	8	1024.0000			

ONEWAY VARIABLE = SUR BY JUN (1,3)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH SURVIVAL

----- O N E W A Y -----

Variable SUR
By Variable JUN

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	1283.5556	641.7778	7.4051	.0240
Within Groups	6	520.0000	86.6667		
Total	8	1803.5556			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH SURVIVAL RATE

Mean	Group	2	3	1
59.3333	Grp 2			
59.3333	Grp 3			
84.6667	Grp 1	*	*	

ONEWAY VARIABLE = SUR BY AUG (1,3)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH SURVIVAL

----- O N E W A Y -----

Variable SUR
By Variable AUG

Analysis of Variance					
Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	1369.5556	684.7778	8.4540	.0180
Within Groups	6	486.0000	81.0000		
Total	8	1855.5556			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH SURVIVAL

Mean	Group	3	2	1
58.3333	Grp 3			
58.6667	Grp 2			
84.6667	Grp 1	*	*	

ONEWAY VARIABLE = SUR BY OCT (1,3)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH SURVIVAL

----- O N E W A Y -----

Variable SUR
By Variable OCT

Analysis of Variance					
Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	2042.0000	1021.0000	4.6480	.0604
Within Groups	6	1318.0000	219.6667		
Total	8	3360.0000			

ONEWAY VARIABLE = SUR BY DEC (1,3)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH SURVIVAL

----- O N E W A Y -----

Variable SUR
By Variable DEC

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	1966.2222	983.1111	2.6294	.1513
Within Groups	6	2243.3333	373.8889		
Total	8	4209.5556			

ONEWAY VARIABLE = SUR BY FEB2 (1,3)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH SURVIVAL

----- O N E W A Y -----

Variable SUR
By Variable FEB2

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	6794.6667	3397.3333	30.1836	.0007
Within Groups	6	675.3333	112.5556		
Total	8	7470.0000			

(*) Denotes pairs of groups' significantly different at the .050 level

MANGROVE SEEDLING WITH SURVIVAL

G G G
r r r
p p p

Mean	Group	3	2	1
.0000	Grp 3			
41.3333	Grp 2	*		
66.6667	Grp 1	* *		

ONEWAY VARIABLE = SUR BY RA (1,7)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH SURVIVAL

----- O N E W A Y -----

Variable SUR
By Variable RA

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	2263.1429	377.1905	8.8207	.0004
Within Groups	14	598.6667	42.7619		
Total	20	2861.8095			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH SURVIVAL

Mean	Group	7	6	5	3	4	2	1
66.6667	Grp 7							
71.6667	Grp 6							
84.0000	Grp 5			*	*			
84.6667	Grp 3			*	*			
84.6667	Grp 4			*	*			
91.0000	Grp 2			*	*			
100.0000	Grp 1	*	*	*	*	*	*	*

ONEWAY VARIABLE = SUR BY BG (1,7)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH SURVIVAL

----- O N E W A Y -----

Variable SUR
By Variable BG

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	6027.3333	1004.5556	5.3258	.0047
Within Groups	14	2640.6667	188.6190		
Total	20	8668.0000			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH SURVIVAL

G G G G G G G
r r r r r r r r
p p p p p p p

Mean	Group	7	6	4	5	3	2	1
41.3333	Grp 7							
57.0000	Grp 6							
58.6667	Grp 4							
59.0000	Grp 5							
59.3333	Grp 3							
72.6667	Grp 2		*					
100.0000	Grp 1		*	*	*	*	*	*

ONEWAY VARIABLE = SUR BY CD (1,7)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH SURVIVAL

----- O N E W A Y -----

Variable SUR
By Variable CD

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	17718.5714	2953.0952	16.9533	.0000
Within Groups	14	2438.6667	174.1905		
Total	20	20157.2381			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH SURVIVAL

G G G G G G G
r r r r r r r r
p p p p p p p

Mean	Group	7	6	5	4	3	2	1
.0000	Grp 7							
35.6667	Grp 6		*					
48.0000	Grp 5		*					
58.3333	Grp 4		*					
59.3333	Grp 3		*					
75.3333	Grp 2		*	*	*			
100.0000	Grp 1		*	*	*	*	*	*

MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

* * * ANALYSIS OF VARIANCE * * *

BY HGR,
TYPE
MONTH

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	13757.223	8	1719.653	1037.572	.000
TYPE	5079.699	2	2539.850	1532.447	.000
MONTH	8677.523	6	1446.254	872.614	.000
2-way Interactions	1941.524	12	161.794	97.620	.000
TYPE MONTH	1941.524	12	161.794	97.620	.000
Explained	15698.747	20	784.937	473.601	.000
Residual	69.610	42	1.657		
Total	15768.357	62	254.328		

ONEWAY VARIABLE = HGR BY FEB (1,3)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

----- O N E W A Y -----

Variable HGR
By Variable FEB

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	.0000	.0000		
Within Groups	6	.0000	.0000		
Total	8	.0000			

ONEWAY VARIABLE = HGr BY APR (1,3)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

----- O N E W A Y -----

Variable HGR
By Variable APR

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	82.8286	41.4143	9.9713	.0124
Within Groups	6	24.9201	4.1533		
Total	8	107.7487			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

G G G
r r r
p p p

Mean	Group	3	2	1
1.2600	Grp 3			
8.0103	Grp 2	*		
8.6833	Grp 1	*		

ONEWAY VARIABLE = HGr BY JUN (1,3)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

----- O N E W A Y -----

Variable HGR
By Variable JUN

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	767.2113	383.6056	172.8221	.0000
Within Groups	6	13.3179	2.2197		
Total	8	780.5292			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

G G G
r r r
p p p

Mean	Group	3	1	2
4.5900	Grp 3			
19.7167	Grp 1	*		
26.7133	Grp 2	* *		

ONEWAY VARIABLE = HGr BY AUG (1,3)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

----- O N E W A Y -----

Variable HGR
By Variable AUG

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	1126.2180	563.1090	712.8965	.0000
Within Groups	6	4.7393	.7899		
Total	8	1130.9574			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

G G G
r r r
p p p

Mean	Group	3	1	2
6.9467	Grp 3			
26.9167	Grp 1	*		
33.1800	Grp 2	* *		

ONEWAY VARIABLE = HGR BY OCT (1,3)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

----- ONEWAY -----

Variable HGR
By Variable OCT

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	1141.8143	570.9071	333.9007	.0000
Within Groups	6	10.2589	1.7098		
Total	8	1152.0732			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

G G G

r r r

p p p

Mean	Group	3	1	2
10.2267	Grp 3			
30.5900	Grp 1	*		
36.5300	Grp 2	* *		

ONEWAY VARIABLE = HGR BY DEC (1,3)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

----- ONEWAY -----

Variable HGR
By Variable DEC

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	1578.4764	789.2382	1103.7096	.0000
Within Groups	6	4.2905	.7151		
Total	8	1582.7668			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

G G G
r r r
p p p

Mean	Group	3 1 2
11.2167	Grp 3	
38.5300	Grp 1	*
40.0300	Grp 2	*

ONEWAY VARIABLE = HGR BY FEB2 (1,3)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

----- O N E W A Y -----

Variable HGR
By Variable FEB2

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	2324.6753	1162.3376	577.1608	.0000
Within Groups	6	12.0833	2.0139		
Total	8	2336.7586			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

G G G
r r r
p p p

Mean	Group	3 2 1
11.2167	Grp 3	
44.8733	Grp 2	*
45.7300	Grp 1	*

ONEWAY VARIABLE = HGR BY RA (1,7)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

----- O N E W A Y -----

Variable HGR
By Variable RA

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	4690.5763	781.7627	420.7323	.0000
Within Groups	14	26.0134	1.8581		
Total	20	4716.5897			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

G G G G G G G
r r r r r r r
p p p p p p p

Mean	Group	1	2	3	4	5	6	7
.0000	Grp 1							
8.6833	Grp 2	*						
19.7167	Grp 3	* *						
26.9167	Grp 4	* * *						
30.5900	Grp 5	* * * *						
38.5300	Grp 6	* * * * *						
45.7300	Grp 7	* * * * * *						

ONEWAY VARIABLE = HGR BY BG (1,7)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

----- O N E W A Y -----

Variable HGR
By Variable BG

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	5532.6607	922.1101	448.1553	.0000
Within Groups	14	28.8060	2.0576		
Total	20	5561.4666			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

Mean	Group	1	2	3	4	5	6	7
.0000	Grp 1							
4.6803	Grp 2	*						
26.7133	Grp 3	* *						
33.1800	Grp 4	* * *						
36.5300	Grp 5	* * * *						
40.0300	Grp 6	* * * * *						
44.8733	Grp 7	* * * * * *						

ONEWAY VARIABLE = HGR BY CD (1,7)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

----- O N E W A Y -----

Variable HGR
By Variable CD

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	6	395.8106	65.9684	62.4420	.0000
Within Groups	14	14.7907	1.0565		
Total	20	410.6013			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH ACCUMULATIVE HEIGHT GROWTH

Mean	Group	1	2	3	4	5	6	7
.0000	Grp 1							
1.2600	Grp 2							
4.5900	Grp 3	* *						
6.9467	Grp 4	* * *						
10.2267	Grp 5	* * * *						
11.2167	Grp 6	* * * * *						
11.2167	Grp 7	* * * * *						

* * * ANALYSIS OF VARIANCE * * *

BY NH3
TYPE
MONTH

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	13.838	5	2.768	4.339	.006
TYPE	.496	2	.248	.389	.682
MONTH	13.342	3	4.447	6.972	.002
2-way Interactions	.730	6	.122	.191	.976
TYPE MONTH	.730	6	.122	.191	.976
Explained	14.568	11	1.324	2.076	.065
Residual	15.309	24	.638		
Total	29.878	35	.854		

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

MANGROVE SEEDLING WITH NO2

*** ANALYSIS OF VARIANCE ***

BY NO2
TYPE
MONTH

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	.008	5	.002	21.380	.000
TYPE	.000	2	.000	.393	.680
MONTH	.008	3	.003	35.372	.000
2-way Interactions	.000	6	.000	.247	.956
TYPE MONTH	.000	6	.000	.247	.956
Explained	.009	11	.001	9.853	.000
Residual	.002	24	.000		
Total	.011	35	.000		

MANGROVE SEEDLING WITH NO2

----- ONEWAY -----

Variable NO2
By Variable RA

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	.0038	.0013	7.3069	.0111
Within Groups	8	.0014	.0002		
Total	11	.0052			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH NO2

G G G G
r r r r
p p p p

Mean	Group	1	2	4	3
.0010	Grp 1				
.0019	Grp 2				
.0047	Grp 4				
.0436	Grp 3				***

ONEWAY VARIABLE = NO2 BY BG (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH NO2

----- O N E W A Y -----

Variable NO2
By Variable BG

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	.0023	.0008	13.2739	.0018
Within Groups	8	.0005	.0001		
Total	11	.0027			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH NO2

G G G G
r r r r
p p p p

Mean	Group	1	2	4	3
.0006	Grp 1				
.0013	Grp 2				
.0036	Grp 4				
.0335	Grp 3				

* * *

ONEWAY VARIABLE = NO2 BY CD (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH NO2

----- O N E W A Y -----

Variable NO2
By Variable CD

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	.0025	.0008	116.1844	.0000
Within Groups	8	.0001	.0000		
Total	11	.0025			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH NO2

G G G G
r r r r
p p p p

Mean	Group	1	2	4	3
.0009	Grp 1				
.0016	Grp 2				
.0039	Grp 4				
.0351	Grp 3		*	*	*

MANGROVE SEEDLING WITH NO3

*** ANALYSIS OF VARIANCE ***

BY NO3
TYPE
MONTH

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	.313	5	.063	5.368	.002
TYPE	.017	2	.008	.727	.494
MONTH	.296	3	.099	8.462	.001
2-way Interactions	.058	6	.010	.823	.563
TYPE MONTH	.058	6	.010	.823	.563
Explained	.371	11	.034	2.889	.014
Residual	.280	24	.012		
Total	.651	35	.019		

ONEWAY VARIABLE = NO3 BY RA (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH NO3

----- O N E W A Y -----

Variable NO3
By Variable RA

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	.1473	.0491	6.1209	.0182
Within Groups	8	.0642	.0080		
Total	11	.2114			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH N03

G G G G
r r r r
p p p p

Mean	Group	1	4	3	2
.0560	Grp 1				
.1570	Grp 4				
.2511	Grp 3		*		
.3549	Grp 2		*	*	

ONEWAY VARIABLE = N03 BY BG (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH N03

----- O N E W A Y -----

Variable N03
By Variable BG

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	.0711	.0237	1.2382	.3580
Within Groups	8	.1531	.0191		
Total	11	.2242			

ONEWAY VARIABLE = N03 BY CD (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH N03

----- O N E W A Y -----

Variable N03
By Variable CD

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	.1354	.0451	5.7567	.0213
Within Groups	8	.0627	.0078		
Total	11	.1981			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH N03

G G G G
r r r r
p p p p

Mean	Group	1	3	4	2
.0468	Grp 1				
.2278	Grp 3		*		
.2968	Grp 4		*		
.3159	Grp 2		*		

MANGROVE SEEDLING WITH P04

*** ANALYSIS OF VARIANCE ***

P04
BY TYPE
MONTH

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	93.579	5	18.716	9.522	.000
TYPE	4.793	2	2.397	1.219	.313
MONTH	88.786	3	29.595	15.057	.000
2-way Interactions	10.287	6	1.714	.872	.529
TYPE MONTH	10.287	6	1.714	.872	.529
Explained	103.866	11	9.442	4.804	.001
Residual	47.172	24	1.965		
Total	151.038	35	4.315		

ONEWAY VARIABLE = P04 BY RA (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH P04

----- ONEWAY -----

Variable P04
By Variable RA

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	11.6999	3.9000	3.0972	.0893
Within Groups	8	10.0736	1.2592		
Total	11	21.7735			

ONEWAY VARIABLE = P04 BY BG (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH P04

----- O N E W A Y -----

Variable P04
By Variable BG

Analysis of Variance					
Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	34.5208	11.5069	8.5606	.0070
Within Groups	8	10.7535	1.3442		
Total	11	45.2743			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH P04

G G G G
r r r r
p p p p

Mean	Group	1	4	2	3
1.5390	Grp 1				
3.5009	Grp 4				
3.7535	Grp 2				
6.3111	Grp 3				

* * *

ONEWAY VARIABLE = P04 BY CD (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH P04

----- O N E W A Y -----

Variable P04
By Variable CD

Analysis of Variance					
Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	52.8522	17.6174	5.3498	.0258
Within Groups	8	26.3449	3.2931		
Total	11	79.1970			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH P04

G G G G
r r r r
p p p p

Mean	Group	1	4	2	3
2.1850	Grp 1				
3.6827	Grp 4				
4.8589	Grp 2				
7.9000	Grp 3				**

MANGROVE SEEDLING WITH K

*** ANALYSIS OF VARIANCE ***

BY K
TYPE
MONTH

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	4867507.127	5	973501.425	29.864	.000
TYPE	143909.173	2	71954.586	2.207	.132
MONTH	4723597.954	3	1574532.651	48.302	.000
2-way Interactions	331542.786	6	55257.131	1.695	.165
TYPE MONTH	331542.786	6	55257.131	1.695	.165
Explained	5199049.913	11	472640.901	14.499	.000
Residual	782341.448	24	32597.560		
Total	5981391.361	35	170896.896		

ONEWAY VARIABLE = K BY RA (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH K

----- O N E W A Y -----

Variable K
By Variable RA

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	2091708.460	697236.1535	39.2842	.0000
Within Groups	8	141988.0442	17748.5055		
Total	11	2233696.505			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH K

G G G G
r r r r
p p p p

Mean	Group	1	2	4	3
710.7167	Grp 1				
1035.1190	Grp 2	*			
1599.0233	Grp 4	*	*		
1740.1267	Grp 3	*	*		

ONEWAY VARIABLE = K BY BG (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH K

----- O N E W A Y -----

Variable K
By Variable BG

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	1754348.271	584782.7571	9.6114	.0050
Within Groups	8	486743.1670	60842.8959		
Total	11	2241091.438			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH K.

G G G G
r r r r
p p p p

Mean	Group	1	2	4	3
723.3887	Grp 1				
1295.7207	Grp 2	*			
1536.4000	Grp 4	*			
1746.0700	Grp 3	*			

ONEWAY VARIABLE = K BY CD (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH K

----- O N E W A Y -----

Variable K
By Variable CD

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	1209084.008	403028.0028	20.9896	.0004
Within Groups	8	153610.2369	19201.2796		
Total	11	1362694.245			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH K

G G G G
r r r r
p p p p

Mean	Group	1	2	3	4
837.4367	Grp 1				
875.4523	Grp 2				
1454.7767	Grp 3	*	*		
1522.9900	Grp 4	*	*		

MANGROVE SEEDLING WITH CA

*** ANALYSIS OF VARIANCE ***

BY CA
TYPE
MONTH

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	73253413.505	5	14650682.701	5.237	.002
TYPE	7362299.667	2	3681149.834	1.316	.287
MONTH	65891113.837	3	21963704.612	7.850	.001
2-way Interactions	5177360.143	6	862893.357	.308	.926
TYPE MONTH	5177360.143	6	862893.357	.308	.926
Explained	78430773.648	11	7130070.332	2.548	.027
Residual	67146068.569	24	2797752.857		
Total	145576842.216	35	4159338.349		

ONEWAY VARIABLE = Ca BY RA (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH CA

----- ONEWAY -----

Variable CA
By Variable RA

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	25787224.90	8595741.633	3.6410	.0639
Within Groups	8	18886597.00	2360824.625		
Total	11	44673821.90			

ONEWAY VARIABLE = Ca BY BG (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH CA

----- ONEWAY -----

Variable CA
By Variable BG

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	31654034.28	10551344.76	2.6538	.1199
Within Groups	8	31806997.61	3975874.702		
Total	11	63461031.89			

ONEWAY VARIABLE = Ca BY CD (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH CA

----- ONEWAY -----

Variable CA
By Variable CD

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	13627214.80	4542404.934	2.2087	.1647
Within Groups	8	16452473.96	2056559.245		
Total	11	30079688.76			

*** ANALYSIS OF VARIANCE ***

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	183156489.291	5	36631297.858	24.755	.000
TYPE	8048657.068	2	4024328.534	2.720	.086
MONTH	178703522.469	3	59567840.823	40.255	.000
2-way Interactions	14388079.126	6	2398013.188	1.621	.185
TYPE MONTH	14388079.126	6	2398013.188	1.621	.185
Explained	197544568.417	11	17958597.129	12.136	.000
Residual	35514139.772	24	1479755.824		
Total	233058708.189	35	6658820.234		

ONEWAY VARIABLE = Mg BY RA (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH MG

----- O N E W A Y -----

Variable MG
By Variable RA

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	96473474.39	32157824.80	23.6856	.0002
Within Groups	8	10861540.42	1357692.553		
Total	11	107335014.8			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH MG

		G G G G
		r r r r
		p p p p
Mean	Group	1 3 2 4
1337.0500	Grp 1	
2593.0667	Grp 3	
3558.9867	Grp 2	
8786.6033	Grp 4	* * *

ONEWAY VARIABLE = Mg BY BG (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH MG

----- O N E W A Y -----

Variable MG
By Variable BG

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	42507744.43	14169248.14	8.8133	.0065
Within Groups	8	12861697.68	1607712.211		
Total	11	55369442.11			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH MG

G G G G
r r r r
p p p p

Mean	Group	1	3	2	4
1742.2167	Grp 1				
2755.1333	Grp 3				
3208.9133	Grp 2				
6738.7333	Grp 4				* * *

ONEWAY VARIABLE = Mg BY CD (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH MG

----- O N E W A Y -----

Variable MG
By Variable CD

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	62827013.78	20942337.93	54.4971	.0000
Within Groups	8	3074270.669	384283.8336		
Total	11	65901284.45			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH MG

G G G G
r r r r
p p p p

Mean	Group	1	3	2	4
1539.3667	Grp 1				
3484.4333	Grp 3		*		
5075.9300	Grp 2		*	*	
7788.9233	Grp 4		*	*	*

MANGROVE SEEDLING WITH NA

*** ANALYSIS OF VARIANCE ***

BY NA
TYPE
MONTH

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	144637242.890	5	28927448.578	57.385	.000
TYPE	1335995.365	2	667997.683	1.325	.285
MONTH	143301247.525	3	47767082.508	94.759	.000
2-way Interactions	3757264.756	6	626210.793	1.242	.320
TYPE MONTH	3757264.756	6	626210.793	1.242	.320
Explained	148394507.646	11	13490409.786	26.762	.000
Residual	12098199.085	24	504091.629		
Total	160492706.731	35	4585505.907		

ONEWAY VARIABLE = Na BY RA (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH NA

----- O N E W A Y -----

Variable NA
By Variable RA

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	49498113.33	16499371.11	91.6478	.0000
Within Groups	8	1440241.431	180030.1789		
Total	11	50938354.76			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH NA

G G G G
r r r r
p p p p

Mean	Group	3	4	1	2
* 5256.4737	Grp 3				
8493.1620	Grp 4		*		
9561.1683	Grp 1		*	*	
10702.9140	Grp 2		*	*	*

ONEWAY VARIABLE = Na BY BG (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH NA

----- O N E W A Y -----

Variable NA
By Variable BG

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	52923925.12	17641308.37	25.0944	.0002
Within Groups	8	5623978.251	702997.2813		
Total	11	58547903.37			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH NA

G G G G
r r r r
p p p p

Mean	Group	3	4	1	2
5091.8833	Grp 3				
7000.0023	Grp 4		*		
9996.1160	Grp 1		*	*	
10050.4843	Grp 2		*	*	

ONEWAY VARIABLE = Na BY CD (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH NA

- - - - - O N E W A Y - - - - -

Variable NA
By Variable CD

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	44636473.83	14878824.61	23.6454	.0002
Within Groups	8	5033979.402	629247.4253		
Total	11	49670453.23			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH NA

G G G G
r r r r
p p p p

Mean	Group	3	4	1	2
5376.0713	Grp 3				
8002.5997	Grp 4	*			
9289.3213	Grp 1	*			
10594.1727	Grp 2	* *			

MANGROVE SEEDLING WITH %SAND

* * * A N A L Y S I S O F V A R I A N C E * * *

BY SAND
TYPE
MONTH

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	537.552	5	107.510	97.982	.000
TYPE	1.639	2	.820	.747	.485
MONTH	535.913	3	178.638	162.806	.000
2-way Interactions	9.143	6	1.524	1.389	.259
TYPE MONTH	9.143	6	1.524	1.389	.259
Explained	546.695	11	49.700	45.295	.000
Residual	26.334	24	1.097		
Total	573.029	35	16.372		

ONEWAY VARIABLE = SAND BY RA (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH %SAND

----- O N E W A Y -----

Variable SAND
By Variable RA

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	188.5820	62.8607	97.9952	.0000
Within Groups	8	5.1317	.6415		
Total	11	193.7137			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH %SAND

G G G G
r r r r
p p p p

Mean	Group	2	1	3	4
14.0800	Grp 2				
14.3867	Grp 1				
16.0800	Grp 3	*	*		
23.8333	Grp 4	*	*	*	

ONEWAY VARIABLE = SAND BY BG (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH %SAND

----- O N E W A Y -----

Variable SAND
By Variable BG

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	177.8030	59.2677	119.7166	.0000
Within Groups	8	3.9605	.4951		
Total	11	181.7636			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH %SAND

G G G G
r r r r
p p p p

Mean	Group	2	1	3	4
12.2000	Grp 2				
15.3867	Grp 1	*			
15.9600	Grp 3	*			
22.7667	Grp 4	*	*	*	

ONEWAY VARIABLE = SAND BY CD (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH %SAND

----- O N E W A Y -----

Variable SAND
By Variable CD

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	178.6708	59.5569	27.6341	.0001
Within Groups	8	17.2416	2.1552		
Total	11	195.9124			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH %SAND

G G G G
r r r r
p p p p

Mean	Group	2	1	3	4
13.2933	Grp 2				
14.0533	Grp 1				
16.6267	Grp 3	*			
23.1000	Grp 4	*	*	*	

MANGROVE SEEDLING WITH %SILT

*** ANALYSIS OF VARIANCE ***

BY SILT
TYPE
MONTH

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	409.755	5	81.951	34.141	.000
TYPE	3.409	2	1.705	.710	.502
MONTH	406.345	3	135.448	56.427	.000
2-way Interactions	10.855	6	1.809	.754	.613
TYPE MONTH	10.855	6	1.809	.754	.613
Explained	420.610	11	38.237	15.930	.000
Residual	57.610	24	2.400		
Total	478.220	35	13.663		

ONEWAY VARIABLE = SILT BY RA (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH %SILT

----- O N E W A Y -----

Variable SILT
By Variable RA

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	132.2086	44.0695	19.5575	.0005
Within Groups	8	18.0267	2.2533		
Total	11	150.2353			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH %SILT

G G G G
r r r r
p p p p

Mean	Group	
38.7667	Grp 4	
44.4933	Grp 3	*
46.2133	Grp 2	*
47.4267	Grp 1	*

ONEWAY VARIABLE = SILT BY BG (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH %SILT

----- O N E W A Y -----

Variable SILT
By Variable BG

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	132.6300	44.2100	22.2803	.0003
Within Groups	8	15.8741	1.9843		
Total	11	148.5041			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH %SILT

G G G G
r r r r
p p p p

Mean	Group	4	3	1	2
39.4067	Grp 4				
45.5200	Grp 3	*			
46.7600	Grp 1	*			
48.0933	Grp 2	*			

ONEWAY VARIABLE = SILT BY CD (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH %SILT

----- O N E W A Y -----

Variable SILT
By Variable CD

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	152.3620	50.7873	17.1370	.0008
Within Groups	8	23.7088	2.9636		
Total	11	176.0708			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH %SILT		G G G G			
		r r r r			
		p p p p			
Mean	Group	4	3	2	1
38.6200	Grp 4				
46.6133	Grp 3	*			
46.6667	Grp 2	*			
47.2133	Grp 1	*			

MANGROVE SEEDLING WITH %CLAY

*** ANALYSIS OF VARIANCE ***

BY	CLAY TYPE MONTH	Sum of Squares	DF	Mean Square	F	Signif of F
Source of Variation						
Main Effects		21.084	5	4.217	3.240	.022
TYPE		.373	2	.187	.143	.867
MONTH		20.711	3	6.904	5.304	.006
2-way Interactions		13.226	6	2.204	1.694	.166
TYPE MONTH		13.226	6	2.204	1.694	.166
Explained		34.311	11	3.119	2.397	.036
Residual		31.236	24	1.302		
Total		65.547	35	1.873		

ONEWAY VARIABLE = CLAY BY RA (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH %CLAY

----- ONEWAY -----

Variable CLAY
By Variable RA

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	10.4800	3.4933	1.8452	.2172
Within Groups	8	15.1456	1.8932		
Total	11	25.6256			

ONEWAY VARIABLE = CLAY BY BG (1.4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH %CLAY

----- O N E W A Y -----

Variable CLAY
By Variable BG

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	6.9775	2.3258	1.2340	.3593
Within Groups	8	15.0784	1.8848		
Total	11	22.0559			

ONEWAY VARIABLE = CLAY BY CD (1.4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH %CLAY

----- O N E W A Y -----

Variable CLAY
By Variable CD

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	16.4800	5.4933	43.4141	.0000
Within Groups	8	1.0123	.1265		
Total	11	17.4923			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH %CLAY

G G G G
r r r r
P P P P

Mean	Group	3	4	1	2
36.7600	Grp 3				
38.2800	Grp 4	*			
38.7333	Grp 1	*			
40.0400	Grp 2	*	*	*	

MANGROVE SEEDLING WITH PH

*** ANALYSIS OF VARIANCE ***

PH
BY TYPE
MONTH

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	1.614	5	.323	19.207	.000
TYPE	.023	2	.011	.674	.519
MONTH	1.591	3	.530	31.563	.000
2-way Interactions	.180	6	.030	1.787	.145
TYPE MONTH	.180	6	.030	1.787	.145
Explained	1.794	11	.163	9.705	.000
Residual	.403	24	.017		
Total	2.197	35	.063		

ONEWAY VARIABLE = pH BY RA (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH PH

----- O N E W A Y -----

Variable PH
By Variable RA

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	.9025	.3008	46.5806	.0000
Within Groups	8	.0517	.0065		
Total	11	.9542			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH PH

G G G G
r r r r
p p p p

Mean	Group	3	2	4	1
6.8000	Grp 3				
6.9667	Grp 2	*			
7.3000	Grp 4	**			
7.5000	Grp 1	***			

ONEWAY VARIABLE = pH BY BG (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH PH

----- O N E W A Y -----

Variable PH
By Variable BG

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	.3133	.1044	5.0133	.0304
Within Groups	8	.1667	.0208		
Total	11	.4800			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH PH

G G G G
r r r r
p p p p

Mean	Group	3	4	2	1
6.9333	Grp 3				
7.2333	Grp 4	*			
7.2667	Grp 2	*			
7.3667	Grp 1	*			

ONEWAY VARIABLE = pH BY CD (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH PH

----- O N E W A Y -----

Variable PH
By Variable CD

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	.5556	.1852	8.0090	.0086
Within Groups	8	.1850	.0231		
Total	11	.7406			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH PH

G G G G
r r r r
p p p p

Mean	Group	3	2	4	1
6.8667	Grp 3				
7.1667	Grp 2	*			
7.2500	Grp 4	*			
7.4667	Grp 1	**			

MANGROVE SEEDLING WITH MOISTURE CONTENT

*** ANALYSIS OF VARIANCE ***

BY MC
TYPE
MONTH

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	263.478	5	52.696	3.431	.018
TYPE	35.266	2	17.633	1.148	.334
MONTH	228.211	3	76.070	4.953	.008
2-way Interactions	26.487	6	4.415	.287	.937
TYPE MONTH	26.487	6	4.415	.287	.937
Explained	289.965	11	26.360	1.716	.130
Residual	368.609	24	15.359		
Total	658.574	35	18.816		

ONEWAY VARIABLE = MC BY RA (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH MOISTURE CONTENT

----- ONEWAY -----

Variable MC
By Variable RA

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	140.6180	46.8727	5.5050	.0240
Within Groups	8	68.1161	8.5145		
Total	11	208.7341			

(*) Denotes pairs of groups significantly different at the .050 level

MANGROVE SEEDLING WITH MOISTURE CONTENT

G G G G
r r r r
p p p p

Mean	Group	2	1	3	4
54.6067	Grp 2				
55.8600	Grp 1				
57.2800	Grp 3				
63.5133	Grp 4				* * *

ONEWAY VARIABLE = MC BY BG (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH MOISTURE CONTENT

----- O N E W A Y -----

Variable MC
By Variable BG

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	49.9172	16.6391	1.0759	.4124
Within Groups	8	123.7183	15.4648		
Total	11	173.6355			

ONEWAY VARIABLE = MC BY CD (1,4)/RANGE =DUNCAN/STATISTIC ALL.
MANGROVE SEEDLING WITH MOISTURE CONTENT

----- O N E W A Y -----

Variable MC
By Variable CD

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	64.1636	21.3879	.9679	.4539
Within Groups	8	176.7751	22.0969		
Total	11	240.9387			

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. SUR

Block Number 1. Method: Stepwise Criteria PIN .0500 POUT .1000
TEST CORRELATION OF PARAMETERS WITH RA

***** MULTIPLE REGRESSION *****

Equation Number 1 Dependent Variable.. SUR

Multiple R .90687
R Square .82242
Adjusted R Square .78296
Standard Error 6.32522

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	1667.59078	833.79539
Residual	9	360.07588	40.00843

F = 20.84049 Signif F = .0004
TEST CORRELATION OF PARAMETERS WITH RA

***** MULTIPLE REGRESSION *****

Equation Number 1 Dependent Variable.. SUR

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
SI	3.218734	.518240	.876139	6.211	.0002
NO3	-32.126353	13.814406	-.328056	-2.326	.0451
(Constant)	-51.937570	22.906527		-2.267	.0496

TEST CORRELATION OF PARAMETERS WITH RA

This procedure was completed at 18:51:52
regress/variables NH3 NO2 NO3 PO4 K CA MG NA SA SI CL PH MO hg
/dependent hg/method stepwise.

TEST CORRELATION OF PARAMETERS WITH RA

***** MULTIPLE REGRESSION *****

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. HG

Block Number 1. Method: Stepwise Criteria PIN .0500 POUT .1000
TEST CORRELATION OF PARAMETERS WITH RA

Multiple R .99188
R Square .98383
Adjusted R Square .97459
Standard Error 2.78195

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	4	3296.26381	824.06595
Residual	7	54.17488	7.73927

F = 106.47853 Signif F = .0000
TEST CORRELATION OF PARAMETERS WITH RA

***** MULTIPLE REGRESSION *****

Equation Number 1 Dependent Variable.. HG

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
SI	-1.833989	.333403	-.388358	-5.501	.0009
K	.028985	.004398	.748411	6.591	.0003
CA	-.001471	5.52725E-04	-.169803	-2.660	.0324
NA	.002014	7.76420E-04	.248304	2.594	.0358
(Constant)	60.366620	22.814712		2.646	.0331

This procedure was completed at 19:12:42
 regress/variables NH3 NO2 NO3 PO4 K CA MG NA SA SI CL PH MO sur
 /dependent sur/method stepwise.

 Page 141 TEST CORRELATION OF PARAMETERS WITH BG

* * * * MULTIPLE REGRESSION * * * *

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. SUR

Block Number 1. Method: Stepwise Criteria PIN .0500 POUT .1000

Multiple R .93602
 R Square .87614
 Adjusted R Square .84862
 Standard Error 9.69434

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	5983.09508	2991.54754
Residual	9	845.82158	93.98018

F = 31.83169 Signif F = .0001

 Page 146 TEST CORRELATION OF PARAMETERS WITH BG

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. SUR

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
MG	-.010514	.001363	-.946722	-7.715	.0000
NH3	14.146536	3.359614	.516728	4.211	.0023
(Constant)	86.952880	5.953046		14.606	.0000

 Page 126 TEST CORRELATION OF PARAMETERS WITH BG

* * * * MULTIPLE REGRESSION * * * *

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. HG

Block Number 1. Method: Stepwise Criteria PIN .0500 POUT .1000

 Page 127 TEST CORRELATION OF PARAMETERS WITH BG

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. HG

Multiple R .93345
 R Square .87132
 Adjusted R Square .84272
 Standard Error 6.99683

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	2983.40502	1491.70251
Residual	9	440.60108	48.95568

F = 30.47047 Signif F = .0001

 Page 137 TEST CORRELATION OF PARAMETERS WITH BG

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. HG

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
MG	.005603	9.42272E-04	.712531	5.946	.0002
PO4	5.659992	1.042043	.650840	5.432	.0004
(Constant)	-14.578208	5.733537		-2.543	.0316

Equation Number 1 Dependent Variable.. SUR

Block Number 1. Method: Stepwise Criteria PIN .0500 POUT .1000

Page 245 TEST CORRELATION OF PARAMETERS WITH CT

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. SUR

Variable(s) Entered on Step Number
2.. K

Multiple R .96403
R Square .92936
Adjusted R Square .91366
Standard Error 11.24853

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	14980.90197	7490.45098
Residual	9	1138.76470	126.52941

F = 59.19929 Signif F = .0000

Page 246 TEST CORRELATION OF PARAMETERS WITH CT

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. SUR

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
MG	-.010228	.001688	-.653956	-6.059	.0002
K	-.046466	.011740	-.427228	-3.958	.0033
(Constant)	152.062909	11.761281		12.929	.0000

Page 235 TEST CORRELATION OF PARAMETERS WITH CT

* * * * MULTIPLE REGRESSION * * * *

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. HG

Block Number 1. Method: Stepwise Criteria PIN .0500 POUT .1000

Page 236 TEST CORRELATION OF PARAMETERS WITH CT

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. HG

Variable(s) Entered on Step Number
1.. K

Multiple R .93695
R Square .87788
Adjusted R Square .86566
Standard Error 1.97124

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	279.32561	279.32561
Residual	10	38.85788	3.88579

F = 71.88391 Signif F = .0000

Page 237 TEST CORRELATION OF PARAMETERS WITH CT

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. HG


----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
K	.014317	.001689	.936950	8.478	.0000
(Constant)	-11.113356	2.760363		-5.394	.0003



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