

ESTABLISHMENT OF SURFACE SOWN SHRUBBY STYLOS

D. GRAMSHAW* and G.M. McKEON**

Queensland Department of Primary Industries

* "Brian Pastures" Pasture Research Station, Gayndah, 4625

** GPO Box 46, Brisbane, 4001

The establishment of new shrubby Stylosanthes pastures involves decisions on time of sowing, pre-sowing treatment of seed, seedbed modification and seedling rate. Past and present formal agronomic experiments aid these decisions, but the results of such experiments are generally specific to the location and to the rainfall pattern during the experiment. In 1983 we commenced an establishment project with Fitzroy stylo in central Queensland, the aim being to overcome the shortcomings of traditional experimentation by developing a computer model which could allow extrapolation and risk analysis using long-term meteorological data.

A major part of the project concentrates on the collection of information to build the model. Environmental conditions and seed and seedling responses are being linked for a range of sowing times at several sites having different soil/grass associations. The remainder involves traditional agronomic experimentation for model validation.

Field research associated with model development addresses three principal phases in the establishment sequence; changes in hardseededness and germination rate of seeds, germination and juvenile seedling survival (0-10 days), and survival of established juvenile seedlings to the reproductive stage.

Modelling is still in the developmental stage, but the data so far obtained suggests:

- * An earlier model, based on November sown seed, and relating the reduction in hardseed content to accumulated day degrees above 50° C at the soil surface, does not adequately predict reduction in hardseed content in January to March sowings.
- * Germination and juvenile seedling survival is influenced by the nature of the rainfall event at germination, with the germination rate of the seed and the race between radicle elongation and the receding drying front both being critical.
- * Seedlings that reach 10-days of age survive well, except in competition with either native or sown grasses under protracted dry conditions.
- * Seedlings establishing in summer in competition with grass seldom flower and set seed by the end of the first growing season.
- * Heat treatment is the most promising seed treatment to aid establishment. The proportion of sowings in which the number of seedlings establishing exceeded 10 per cent of the viable seed sown were: heat treated, 69; scarified, 31; and untreated, 15 per cent.

LIST OF DELEGATES

ADAMS, Mr. G.T., CSIRO, Division of Tropical Crops and Pastures, Cunningham Laboratory, 306 Carmody Road, St. Lucia, Qld. 4067.

ANDREW, Dr. M.H., CSIRO, Division of Tropical Crops and Pastures, Darwin Laboratories, PMB 44, Winnellie, N.T. 5789.

AYRES, Dr. J.F., N.S.W. Department of Agriculture, Agricultural Research Centre, Wollongbar, N.S.W. 2480.

BAHNISCH, Dr. L., Queensland Agricultural College, Lawes, Qld. 4343.

BLAIR, Dr.G.J., Department of Agronomy and Soil Science, University of New England, Armidale, N.S.W. 2351.

BURROWS, Dr. W.H., Queensland Department of Primary Industries, P.O. Box 689, Rockhampton, Qld. 4700.

CAMERON, Mr. A., N.T. Department of Primary Production, G.P.O. Box 4160, Darwin, N.T. 5794.

CAMERON, Dr. D.F., CSIRO, Division of Tropical Crops and Pastures, Cunningham Laboratory, 306 Carmody Road, St. Lucia, Qld. 4067.

CAVAYE, Mr. J., Queensland Department of Primary Industries, P.O. Box 308, Roma, Qld. 4455.

CLEWETT, Dr. J.F., Queensland Department of Primary Industries, P.O. Box 81, Emerald, Qld. 4720.

COOK, Dr. S.J., CSIRO, Division of Tropical Crops and Pastures, Cunningham Laboratory, 306 Carmody Road, St. Lucia, Qld. 4067.

COWAN, Dr. T., Queensland Department of Primary Industries, Mutdapilly Research Station, MS 825, Ipswich, Qld. 4305.

DAVIS, Mr. R., Queensland Department of Primary Industries, P.O. Box 1054, Mareeba, Qld. 4880.

DICKER, Mr. R., N.S.W. Department of Agriculture, Agriculture Research and Advisory Station., Glen Innes, N.S.W. 2460.

EDYE, MR. L.A., CSIRO, Division of Tropical Crops and Pastures, Davies Laboratory, Private Mail Bag, P.O., Aitkenvale, Qld. 4814.

EMMERY, Mr. P., Cattlemens Union, Muldoon, Marlborough, Qld. 4705.

EVANS, Mr. T.R., CSIRO, Division of Tropical Crops and Pastures, Cunningham Laboratory, 306 Carmody Road, St. Lucia, Qld. 4067.

FILET, Mr. P., University of Queensland, Department of Agriculture, St. Lucia, Qld. 4067.

FUJITA, Mr. H., University of Queensland, Department of Agriculture, St. Lucia, Qld. 4067.

GIBSON, Mr. T.A., University of Queensland, Department of Agriculture, St. Lucia, Qld. 4067.

GRAMSHAW, Dr. D., Queensland Department of Primary Industries, Brian Pastures Research Station, Gayndah, Qld. 4625.

GUTTERIDGE, Dr. R.C., University of Queensland, Department of Agriculture, St. Lucia, Qld. 4067.

HANCOX, Mr. J.M., Consolidated Fertilizers Limited, P.O. Box 883, Bundaberg, Qld. 4670.

HARRISON, R.E., Primary Producer, "Bilarabyn", Veresdale, Beaudesert, Qld. 4283.

HENDRICKSON, Mr. R.E., Queensland Department of Primary Industries, P.O. Box 1054, Mareeba, Qld. 4880.

HOOLEY, Dr. R.W., Australian Journal of Experimental Agriculture, P.O. Box 89, East Melbourne, Vic. 3002.

HOPKINS, Dr. P., Queensland Department of Primary Industries, G.P.O. Box 46, Brisbane, Qld. 4001.

HOWDEN, Mr. M., CSIRO, Davies Laboratory, Private Mail Bag, Post Office, Aitkenvale, Qld. 4814.

HUMPHREYS, Dr. L.R., University of Queensland, Department of Agriculture, St. Lucia, Qld. 4067.

HUMPHREYS Mr. R.J., Queensland Department of Primary Industries, P.O. Box 96, Ipswich, Qld. 4305.

IRWIN, Dr. J.A.G., University of Queensland, Department of Botany, St. Lucia, Qld. 4067.

ISON, Dr. R.L., Hawkesbury College of Advanced Education, Richmond, N.S.W. 2753.

JONES, Dr. R.J., CSIRO, Division of Tropical Crops and Pastures, Cunningham Laboratory, 306 Carmody Road, St. Lucia, Qld. 4067.

JONES, Mr. R.M., CSIRO, Division of Tropical Crops and Pastures, Cunningham Laboratory, 306 Carmody Road, St. Lucia, Qld. 4067.

KERRIDGE, Dr. P.C., CSIRO, Division of Tropical Crops and Pastures, Cunningham Laboratory, 306 Carmody Road, St. Lucia, Qld. 4067.

KLEINSCHMIDT, Mr. F., Queensland Agricultural College, Lawes, Qld. 4343.

KLEPACKI, Mr. N., W.A. Department of Agriculture, Kununurra, W.A. 6743.

LEMCKE, Mr. B.G., N.T. Department of Primary Production, G.P.O. Box 4160, Darwin, N.T. 5794.

LESLIE, Dr. J.K., Queensland Department of Primary Industries, G.P.O. Box 46, Brisbane, Qld. 4001.

LOWE, Mr. K.F., Queensland Department of Primary Industries, Ipswich, Qld. 4305.

MacFARLANE, Mr. D., University of Queensland, Department of Agriculture, St. Lucia, Qld. 4067.

MacTAGGART, Mr. J.A., Capricornia Graziers Association, "Bears Lagoon", Moura, Qld. 4718.

McCOWN, Dr. R.L., CSIRO, Division of Tropical Crops and Pastures, Davies Laboratory, Private Mail Bag, P.O. Aitkenvale, Qld. 4814.

McIVOR, Dr. J.G., CSIRO, Division of Tropical Crops and Pastures, Davies Laboratory, Private Mail Bag, P.O., Aitkenvale, Qld. 4814.

McKEAGUE, Mr. E.J., Primary producer, "Ohio", Gogango, Qld. 4702.

McKEON, Dr. G.M., Queensland Department of Primary Industries, G.P.O. Box 46, Brisbane, Qld. 4001.

McLEAN, Mr. R.W., CSIRO, Division of Tropical Crops and Pastures, Cunningham Laboratory, 306 Carmody Road, St. Lucia, Qld. 4067.

McLENNAN, Mr. S.R., Queensland Department of Primary Industries, Swans Lagoon Research Station, Millaroo, Qld. 4807.

MAY, Mr. I., Agronomist/Grazier, "Maylands", Tyalgum, N.S.W. 2484.

MEARS, Dr. P.T., N.S.W. Department of Agriculture, Agriculture Research and Advisory Station., Grafton, N.S.W. 2460.

MENSINGA, Mr. W.J., Arthur Yates and Company Pty. Limited, P.O. Box 117, Rockhampton, Qld. 4700.

MICHALK, Dr. D.L., N.S.W. Department of Agriculture, Agricultural Research and Veterinary Centre, Orange, N.S.W. 2800.

MOTT, Dr. J.J., CSIRO, Division of Tropical Crops and Pastures, Cunningham Laboratory, 306 Carmody Road, St. Lucia, Qld. 4067.

MURTAGH, Dr. G.J., N.S.W. Department of Agriculture, Agricultural Research Centre, Wollongbar, N.S.W. 2480.

OLIVE, Mr. J., Primary producer, "Granite Vale", Wumalgi Mail Bag, Rockhampton, Qld. 4700.

PARTRIDGE, Mr. I.J., Queensland Department of Primary Industries, Bundaberg, Qld., 4670.

PEIRIS, Mr. H., University of Queensland, Department of Agriculture, St. Lucia, Qld. 4067.

PRATCHETT, Mr. D., W.A. Department of Agriculture, Kununurra, W.A. 6473.

PULSFORD, Mr. J., Incitec Limited, P.O. Box 140, Morningside, Qld. 4170.

RICE, Mr. G.J., Arthur Yates and Company Pty. Limited, P.O. Box 117, Rockhampton, Qld. 4700.

RICKERT, Dr. K.G., Queensland Agricultural College, Lawes, Qld. 4343.

ROSS, Ms B., N.T. Department of Primary Production, G.P.O. Box 4160, Darwin, N.T. 5794.

SCANLAN, Mr. J., Queensland Department of Primary Industries, P.O. Box 689, Rockhampton, Qld. 4700.

SHELTON, Dr. H.M., University of Queensland, Department of Agriculture, St. Lucia, Qld. 4067.

SIRISENA, Mr. P.S.M., University of Queensland, Department of Agriculture, St. Lucia, Qld. 4067.

STAPLES, Mr. I.B., Queensland Department of Primary Industries, P.O. Box 1054, Mareeba, Qld. 4880.

STEPHENSON, Mr. R.G.A., Queensland Department of Primary Industries, Wool Biology Lab, 665 Fairfield Road, Yeerongpilly, Qld. 4105.

STOCKWELL, Mr. T., N.T. Department of Primary Production, G.P.O. Box 4160, Darwin, N.T. 5794.

STRICKLAND, Mr. R.W., CSIRO, Division of Tropical Crops and Pastures, Cunningham Laboratory, 306 Carmody Road, St. Lucia, Qld. 4067.

SULLIVAN, Mr. M.T., Queensland Department of Primary Industries, P.O. Box 282, Chaleville, Qld. 4470.

TAYLOR, Dr. J.A., CSIRO, Division of Tropical Crops and Pastures, Cunningham Laboratory, 306 Carmody Road, St. Lucia, Qld. 4067.

TEITZEL, Mr. J.K., Queensland Department of Primary Industries, South Johnstone, Qld. 4859.

VALLIS, Dr. I., CSIRO, Division of Tropical Crops and Pastures, Cunningham Laboratory, 306 Carmody Road, St. Lucia, Qld. 40067.

VERCOE, Dr. J.E., Division of Tropical Animal Science, CSIRO, P.O. Box 5545, Rockhampton, Qld. 4701.

WALKER, Dr. B., Queensland Department of Primary Industries, G.P.O. Box 46, Brisbane, Qld. 4001.

WESLEY-SMITH, Mr. R., N.T. Department of Primary Production, P.O. Box 4160, Darwin, N.T. 5794.

WHITEMAN, Dr. P.C., Univ. of Queensland, Department of Agriculture, St. Lucia, Qld. 4067.

WICKSTEED, Mr. L., Queensland Department of Primary Industries, 12 Wickham Street, Townsville, Qld. 4810.

WILDIN, Mr. J.H., Queensland Department of Primary Industries, P.O. Box 689, Rockhampton, Qld. 4700.

WILLIAMS, Mr. A., W.A. Department of Agriculture, Kununurra, W.A. 6743.

WILLIAMS, Mr. L., Queensland Department of Primary Industries, G.P.O. Box 46, Brisbane, Qld. 4001.

WILLIAMS, Mr. R.J., CSIRO, Division of Tropical Crops and Pastures, Cunningham Laboratory, 306 Carmody Road, St. Lucia, Qld. 4067.

WILSON, Mr. G.P.M., N.S.W. Department of Agriculture, Agriculture Research and Advisory Station., Grafton, N.S.W. 2460.

WILSON, Mr. T., Queensland Department of Primary Industries, G.P.O. Box 46, Brisbane, Qld. 4001.

WINKS, Mr. L., Queensland Department of Primary Industries, Wool Biology Laboratory, 665 Fairfield Road, Yeerongpilly, Qld. 4105.

WINTER, Dr. W.H., CSIRO, Division of Tropical Crops and Pastures, Darwin Laboratories, Private Bag 44, Winnellie, N.T. 5789.