

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH
NEW ZEALAND

Colonial Bentgrass Breeding:

Background: The aim of this project is to breed a cultivar of colonial bentgrass (*Agrostis capillaris* syn. *A. tenuis*) that is suitable for golfcourses in the USA, but needs less water and other maintenance than current cultivars.

The strategy used was to collect attractive plants already growing naturally on the fairways of golfcourses situated in dry regions of New Zealand. Such plants would have survived under conditions of infrequent mowing, low soil fertility and moisture, and insect/disease attacks. About 1200 such plants were collected (from 70 golfcourses) in 1987, and re-planted at Palmerston North, to give comparative data in swards and in flowering blocks.

After the first year it was obvious that:

- a) Some golfcourses had provided more exciting material than others. For this reason, a second collection (of 180 plants) was made in 1988 from these particular courses.
- b) There was a high proportion (about $\frac{1}{3}$) of the closely related species Dryland bent (*A. castellana*) identified in the collection. This confirmed the earlier belief that this second species might be as suitable as *A. tenuis* for low maintenance dry soils, and should be added to the project.

Progress in 1989:

- 1) The extra 180 plants collected in 1988 have been replicated and planted alongside the first group, to provide comparable data on flowering this coming summer.

- 2) The extra 180 plants have been planted into a closely mown sward, along with the most promising ones of the first group. Data are already being taken on density, colour, fineness etc. Hopefully, this coming summer will allow us also to collect data on drought/heat tolerance.
- 3) A selection of 107 plants was made of the first collection, prior to flowering last summer. These were allowed to interpollinate, and seed was harvested separately from each plant. Each of these progenies has been planted out as seedlings at Palmerston North, to assess the uniformity and general merit, and allow scope for further selection.
- 4) The same progenies have been sent to a site in the USA, and sown out as replicated rows. This will allow some screening for the local diseases, climate stresses etc.
- 5) A selection of Dryland bent (A. castellana) has been sent to the USA for inclusion in the National Evaluation Series for bentgrasses. This selection does not derive from the golfcourse collections in 1987 and 1988, but instead (for the sake of expediency) from an earlier project at DSIR.

Future work: The plant collections are now completed, and organised to provide both flowering and sward data. We will spend the next 12 months collecting that data. Prior to flowering in December 1990, we would hope to select the best material, and then interpollinate it. The resulting seed would be used for a progeny test in 1991, and simultaneously increased in time for the next National Evaluation Series for bentgrasses, presumably starting in 1992. This would complete the project.

Resources used in project: The same four staff (Bill Rumball, Peter Evans, David Havill, Roger Claydon) have worked on the project this year. Most of

the budget this year was spent on collecting (and analysing) the data needed to make the 107 plant selection. The budget then financed the harvesting, cleaning and packaging of these 107 progenies. It also paid for the health certificates and postage to send the seed to our USA collaborator for further screening; and to germinate and plant the same progenies at Palmerston North.

The budget was used also to organise a refinement of the DSIR A. castellana selection, a field-size seed increase, the harvest and cleaning of this seed, and its transfer to the USA for the National Evaluation Series (Br 1518). The USGA very kindly gave a supplementary grant to cover the fees for this evaluation.

I consider we have been extremely fortunate and privileged to obtain a collaboration for screening the 107 progenies in the USA itself. Although the person involved over there, did not request or even accept recompense, I propose that a fair amount of the 1990 allocation of \$10,000 to DSIR, be directed to this USA centre for repayment of the costs involved. Assuming the seed has been successfully sown, and established, I would also like to request that some of the remaining allocation to DSIR be used to allow me to divert to this USA centre during some future visit overseas. I am scheduled to visit Argentina for a (pasture) breeding project in March 1990, and it would probably not cost much extra to divert to USA, to collect data on the 107 progenies. Autumn diseases might be obvious about that period.