

FINAL REPORT

UA539

Association mapping in wheat

PROJECT DETAILS

PROJECT CODE: UA539

PROJECT TITLE: ASSOCIATION MAPPING IN WHEAT

START DATE: 01.07.2001

END DATE: 30.06.2002

SUPERVISOR: PETER LANGRIDGE

ORGANISATION: ADELAIDE UNIVERSITY

CONTACT NAME: PETER LANGRIDGE

Summary

This project was originally developed as a five year project, following consultation with the GRDC and the establishment of a national and international workshop to review and evaluate the project. This project also included plans for a similarly funded data analysis project to develop appropriate data analysis capabilities in support of the association mapping project. However, as current funding was terminated after a period of twelve months and the data analysis project never eventuated, the scope for achieving the stated goals of this project was limited. However, given the available timeframe, significant achievements were made with regard to establishing the molecular marker techniques required to undertake such an exercise in future projects. Considerable funding from the Cooperative Research Centre-Molecular Breeding Program (CRC-MBP) was received in addition to that provided by the GRDC.

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Conclusions

Although this project was developed as a five year program with a concurrent data analysis project, significant value has been derived from the resources available. Outputs were achieved and exceeded for the twelve months. Other outputs could not be achieved, but have been integrated into the ET3 association mapping project.

Recommendations

Continued funding through the new wheat and barley association mapping project ET3 is required to achieve the objectives of the original 12 month project.

Outcomes

Expected Outcome (benefits)

Economic Outcomes

Expected outcomes will be delivered through the new project.

Environmental Outcomes

Expected outcomes will be delivered through the new project.

Social Outcomes

Expected outcomes will be delivered through the new project.

Achievements/Benefits

Overview of Project Achievements

Summary of achievements

1. Identification of pedigrees of accessions and populations suitable for study.
2. Sourcing of plant material for use in this study along with DNA isolation of approximately 500 lines.
3. Identification of wheat simple sequence repeat (SSR) primers giving approximate genome coverage.
4. Establishment of up to 16-fold multiplex SSR analysis.
5. Establishment of an integrated GeneFlow database of Accessions, Pedigrees, Marker data, Primer data.

Five hundred wheat lines of importance to the Australian wheat improvement programs were identified for analysis. Pedigrees of these lines were elucidated. Primers were identified and synthesised and all this data incorporated into the GeneFlow database.

In consultation with breeders, 250 wheat accessions were identified as part of a pedigree based genotyping study. These comprised all the major modern varieties currently in use and as many of the lines contributing to their pedigrees as possible. In addition, 11 breeding populations consisting of approximately 250 lines were identified for use in this program.

Other research

This project has provided the basis of the wheat component of the Australian Winter Cereals Molecular Marker Program (AWCMMP) association mapping project ET3.