



FINAL REPORT

Maintaining & Enhancing Core Skills & Capabilities within the NSW Sugar Milling Co-operative Limited for a Sustainable NSW Sugar Industry

Project: NSC004

Research Organisation: NSW Sugar Milling Co-operative

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Executive Summary

This report describes a 3-year project to improve industry competitiveness by maintaining and enhancing core skills and capabilities within the NSW sugar industry. The project commenced in July 2001. Seven major objectives to improve industry competitiveness were identified and include, the delivery of an efficient plant breeding program; the maximising of productivity by controlling pest and diseases; the development of best practice for the NSW Sugar Industry for both on farm activities and relationships with the community; the development of new strategies to maintain the competitiveness of the NSW sugar industry; the delivery of an essential extension service to co-operative members; the maintenance of core skills within the co operative for industry competitiveness and the development of an environmental management system for canegrowing and to underpin environmental awareness with NSW cane growers.

The project targeted three core areas identified in an Activity Plan for Core Competency funding (refer Appendix 1) developed at the commencement of the project.

The three core areas identified in the Activity Plan were

- Productivity enhancement
- Community and Environment
- New Business, Co-generation

Productivity enhancement

Key areas of productivity enhancement targeted were Productivity Improvement and Enhancement, Pest and Disease management, Farming Systems and Plant Breeding.

Significant effort has been applied and gains realized in key areas of productivity enhancement. A productivity improvement strategy was developed early on in this project and a key part of this strategy is the locally based Canecheck productivity groups, targeted extension and identification of key success factors.

Canecheck activities across NSW provide the platform for a range of extension and on farm development activities. Participation by co-operative members in extension activities is high and gains in adoption of improved farm management practices are being realised.

Pest and Disease management programs were operated by the NSW Cane Protection and Productivity Boards (CPPB). These active programs operated by the CPPB's have targeted major diseases such as Fiji Leaf Gall and Ratoon Stunting Disease. NSW CPPB's adopted a rigorous approach to disease control that included assessment and testing of growers plant cane sources and the growing and distribution of disease free Approved Seed. A particular success has been the systematic approach adopted at Harwood Mill where the annual release and extension of Approved Seed Cane and regular testing of growers seed cane have resulted in a 30% decline in RSD levels over eight years. The Approved Seed plots are the cornerstones of the disease control program. NSW productivity Boards distribute around 1200 tonnes of disease free cane each year from Approved Seed Plots, a figure not matched elsewhere in the Australian industry.

In readiness for the industry change to whole of crop harvesting and the consequence of additional in-field traffic needed to haul the lower density cane and trash material from the field to the cane pads the NSW industry commenced development work on a new farming system. This farming system is needed specifically for the often-wet NSW climatic and field conditions and to suit the more trafficked conditions that will occur with whole of crop harvesting. A modified farming system utilising dual rows and defined traffic ways will offer major advantages for crop growth and soil health. Initial results from six NSW field trials indicate a 7% potential yield gain from this system. New project funding from SRDC was received in July 2003 for this work to continue.

The NSW plant breeding and selection program has shown excellent success over the period of the project. Selection of productive varieties for the wet and cool conditions of NSW is essential for industry productivity. Fourteen (14) productive new varieties have been released to NSW members from the period 2001 to 2004.

These varieties demonstrate a range of suitability for NSW soil types, one and two year old cropping, tolerance to Fiji leaf gall and frosting.

Community and Environment

Best Practice environmental management particularly the maintenance of the unique self-regulation scheme for acid sulfate soils has been a keen focus of the achievement. The NSW industry is the only rural industry in Australia to have an industry/government approved self regulation scheme for the management of acid sulfate soils. The industry conducts an annual audit of 30 NSW cane grower members and reporting to local and state government on the progress of the scheme. In 2003 there was a 100% compliance rate with the farm specific acid hazard and drain management plans.

The industry has responded positively to environmental challenges and has positioned the industry as a partner with the community.

New Business, co-generation

Efforts in this area were directed to the proposed joint venture with Delta Electricity to develop two co-generation facilities at Condong and Broadwater Mills. Key development work in whole of crop harvesting and transport was successful in the development of a modified harvester capable of cutting green and lodged two year old crops at a forward cutting speed necessary to contain costs with the payment that will be made by the Co-operative for trash and leaf.

The three-year project has resulted in maintenance of skills within the NSW industry. The NSW Sugar Milling co-operative provides much of the infrastructure to support R, D and E activities and this project has enabled the industry to improve competitive skills. The maintenance of the core skills and capabilities has been essential for the NSW Industry to meet the current challenges and position the industry to be competitive in the future.

Good crop management, a lowering of disease levels, productive varieties and a strong extension service have contributed significantly. Core Competency funding provided by SRDC has ensured that the industry remains a strong high quality supplier of raw and refined sugar and energy to the Australian marketplace.

PROJECT BACKGROUND (NSC004)

Project Number: NSC004

Project Title: Maintaining & Enhancing Core Skills & Capabilities within the NSW Sugar Milling Co-operative Limited for a Sustainable NSW Sugar Industry

Duration: 01/07/01-30/06/04

Research Organisation: NSW Sugar Milling Co-operative Ltd

Project Administration: Greg Messiter, NSW Sugar Milling Coop, Broadwater.
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Project Objectives:

To improve industry competitiveness by supporting

- The delivery of an efficient plant breeding program
- The maximising of productivity by controlling pest and diseases
- The development of best practice for the NSW Sugar Industry for both on farm activities and relationships with the community
- The development of new strategies to maintain the competitiveness of the NSW sugar industry
- The delivery of an essential extension service to co-operative members
- The maintenance of core skills within the co operative for industry competitiveness
- The development of an environmental management system for canegrowing and to underpin environmental awareness with NSW cane growers.

An Activity Plan for Core Competency funding was developed which detailed achievement areas of

- Productivity
- Community and Environment
- New Business

Work in these 3 achievement areas is detailed below.

Methodology

This is the final report of this 3-year project and includes a description of the achievements in the three core areas identified in the Activity Plan for Core Competency funding developed in 2001 (Appendix 1).

These are listed below, along with details of accomplishments on each.

- Achievement 1: Productivity
- Achievement 2: Community and Environment
- Achievement 3: New Business, Co-generation

Achievement 1: Productivity

Productivity Improvement & Extension

NSW Agricultural staff conducts an active program of productivity improvement and extension. The Co-operative works closely with BSES Limited and developed annual work programs for productivity enhancement. A productivity improvement strategy was developed early on in this project by the Agricultural team in NSW in collaboration with the Board of Directors and corporate management of the NSW Sugar Milling Co-operative. The key parts of this strategy are the locally based Canecheck productivity groups and targeted extension and identification of key success factors.

Canecheck activities provide the platform for a range of extension and on farm development activities. Targeted extension by working closely with NSW cane grower members on improving farm management practices is an integral part of the productivity strategy and complements the Canecheck activities. Participation by co-operative members in extension activities is high and gains in adoption of improved farm management practices are being realised.

Pest & Disease Management

NSW Cane Protection & Productivity Boards (CPPB) operates active programs of pest and disease control. Programs are in place to manage pest and disease issues such as Fiji Leaf Gall, Ratoon stunting and Chlorotic streak disease.

A particular success has been the systematic approach adopted at Harwood Mill where the Productivity Board adopted a rigorous approach to the control of ratoon stunting

disease by regular testing of growers seed cane and extensive distribution of disease free Approved Seed, a 30% decline in RSD levels over eight years has been achieved.

The Broadwater and Condong CPPB's operate similar programs and have demonstrated significant reduction in disease incidence.

NSW Productivity Boards grow and distribute around 1200 tonnes of disease free cane each year from Approved Seed Plots. This is the cornerstone of the disease control program.

By conducting these programs the NSW industry has managed to maintain productivity levels of highly productive but disease susceptible varieties for example Q124, RB72-454 and BN73-3416.

Farming Systems

Development work on a farming system specifically for NSW climatic conditions and to suit the more trafficked conditions that will occur with whole of crop harvesting for co-generation is underway. A modified farming system utilising dual rows, defined traffic ways and GPS guidance will offer major advantages for crop growth and soil health. Initial results from the six NSW farming system trial sites indicate a 7% potential yield gain from this system.

New project funding for this activity commenced in 2003 with project NSC005.

Plant Breeding

The NSW plant breeding program has shown real success over the past 3 years. This program has been modified to now include on farm final assessment trials in differing locations each year. These trials will allow variety selection for specific soil types and environments such as frosting. Canecheck groups regularly visit these sites allowing local growers to view the variety performance.

Annual variety selection meetings convened by the Co-operative, NSW Productivity Boards and BSES Limited have identified a range of productive varieties for productivity enhancement.

Cane varieties released to NSW members over the last 3 years include

Q188, Q202, Q203, Q205, Q210, Q211, Q212, Q213, Q214, BN82-2384, BN86-3017, BN88-3108, BN88-3291, BN88-3347.

These varieties show a range of suitability characteristics for soil and environment conditions, one or two-year cropping and disease resistance.

Adoption of these new varieties has been strong. For the 2003 planting season newly released varieties comprised around 20% of the area planted in NSW.

The breeding of productive new varieties suited to the cooler, wetter conditions of NSW cane growing areas is essential for long term productivity enhancement.

Achievement 2: Community and Environment

Environmental Management Systems

The development and enhancement of industry and on-farm environmental awareness is a key priority for the Co-operative.

The NSW Sugar industry continues to lead in the on farm management of acid sulfate soils through the unique self-regulation scheme. The NSW industry is the only rural industry in Australia to have an industry/government approved self-regulation scheme for the management of acid sulfate soils. The industry in collaboration with local authorities conducts an annual audit of acid management practices of 30 NSW cane grower members. The third annual audit of acid management practices of NSW growers was completed in July 2003 and showed a 100% compliance with the farm specific acid hazard and drain management plan. The industry has invested close to one million dollars to achieve the position of a self-regulation and the world recognized scheme provides great benefits and flexibility to NSW cane growers.

The Environment Committee of the NSW Cane Growing industry has endorsed the development of a concise Code of Practice for cane growing which together with the COMPASS program will underpin a management system for NSW cane farms. Development of the Code of Practice and the subsequent environmental management system has been delayed pending the outcome of the Australian sugar industry environmental audit commissioned by the Industry Guidance Group. This is expected to

set the platform for future Codes of Practice. The NSW industry is also a willing participant in the recently DAFF funded Pathways to Industry EMS project.

Community & Environment

The NSW industry has responded positively to environmental challenges and continues with the development of good relationships with the community.

As a partner in the Energy Smart Business Program with the NSW Sustainable Energy Development Authority (SEDA), a number of energy saving projects have been identified and implemented at Harwood in recent years, which has helped to steadily reduce the consumption of coal. In 2003 the coal consumption was the lowest since the refinery began production. The NSW industry is also a partner in the Greenhouse Challenge Program with the Australian Greenhouse Office (AGO). The Co-operative is looking at ways of reducing emissions and to set new emission targets.

The industry has continued with strong representation on local Catchment Management authorities and has participated willingly in projects such as active floodgate management to allow tidal water exchange and enhance fish breeding habitats.

Considerable effort is put to strengthening the knowledge of the industry with the community and the development of the industry as a real partner in the region.

The water quality project recently completed in 2003 has compiled a significant amount of information for assessment of water quality trends and the interactive nature of this project has helped to raise awareness and change practices that subsequently led to measurable improvements in water quality particularly pesticide residues.

This project has been instrumental in demonstrating to the community a level of stewardship with respect to environmental management.

Achievement 3: New Business

Efforts in this area were directed to the proposed joint venture with Delta Electricity to develop two co-generation facilities at Condong and Broadwater Mills. Local appeals and commercial aspects have delayed the proposed project.

The Co-operative has established a firm base of technology and practical experience in renewable energy exports and more importantly, that the market for renewable energy certificates (REC's) is established and traded REC values are now well accepted and

documented. This market information provides confidence in the progress towards the proposed co-generation projects at the 2 mills.

Key development work in whole of crop harvesting and transport has been successful. Harvesting of the cane crop without burning provides some major challenges in handling large yielding two-year-old crops. Significant development work has been undertaken to modify cane harvesters to handle these large green crops.

Development work was conducted with CNH Austoft during the 2002 crushing season. On going improvements and modifications resulted in an improvement in feeding of cane in to the harvester and a 25% improvement in forward speed was achieved as a direct result of the trial work. Two-year-old crops in the order of 170 tonnes/ha were cut during the trial periods. The modified harvesters are now able to harvest these crops within 2km/hour of the current burnt cane harvesting speed, which is necessary to contain harvesting costs within the harvest cost recovery payment.

This co-generation project will provide major benefits to the Co-operative's milling operations and will allow a cessation of cane burning. This would have been impossible unless a viable off farm use for the large volume of trash material resulting from a two-year crop could be found.

Outputs

The following outputs were achieved

Maintenance of the core skills to support the development of the industry to meet future issues and challenges

Development and extension of best practice both on and off farm for the long term sustainability of the NSW sugar industry

A high level of skills within the Co-operative to maintain the industry in the forefront of technology and competitive within the Australian sugar industry.

Intellectual Property

Nil

Outcomes

The core competency funding has improved the skills and capability within the co-operative to maintain and improve productivity in the NSW industry.

Good progress to the objectives in the Activity Plan for Core Competency funding has been realised. The maintenance of the core skills and capabilities has been essential for the NSW Industry to meet the current challenges and position the industry to be competitive in the future. Productivity in the NSW Sugar Industry measured as tonnes of cane per harvested hectare have improved by 9% in the last 3 years despite some adverse environmental conditions of flood and frost events.

Good crop management, a lowering of disease levels, productive varieties and a strong extension service have contributed significantly. Core Competency funding provided by SRDC has ensured that the industry remains a strong high quality supplier of raw and refined sugar and energy to the Australian marketplace.

Future Research Needs

On-going support from SRDC for targeted projects is necessary for industry development. The NSW Sugar Industry will continue to submit industry projects that are aligned with the priorities of the Co-operative's strategic plan.

Recommendations

The core competency funding has been important for the maintenance of skills within the Co-operative. This funding also ensured the provision of services from the industry R, D and E providers BSES Limited and SRI. Strong on-going industry support is necessary to ensure that industry competitiveness is maintained.

Publications

Project results and recommendations were regularly published in local industry newsletters listed below

Sunshine Sugar News, the monthly newsletter of the NSW Sugar Milling Co-operative.

Condong Courier, a newsletter for Condong members.

Around the Paddocks, a newsletter for Broadwater members.

Harwood Cane News, a newsletter for Harwood members.

APPENDIX 1

Activity Plan for Core Competency Funding To The New South Wales Sugar Milling Co-Operative Limited

OVERVIEW

This plan for 2003/04 outlines a program of activities to ensure the development of the NSW Sugar Industry. Activities are aligned with objectives listed in the full proposal “Maintaining and Enhancing Core Skills and Capabilities with the NSWSMC for a Sustainable NSW Sugar Industry” and key business objectives of the co-operative.

PLAN

The NSWSMC will improve industry competitiveness and capabilities through the following areas.

1. PRODUCTIVITY

1.1 The delivery of an active program of productivity improvement. There are currently two programs operating firstly a joint program of work developed in conjunction in the BSES contract staff that focuses on agreed industry priorities and secondly a productivity improvement strategy developed at the request of the NSW Sugar Milling Co-operative Board.

1.2 The delivery of an essential extension service to NSW canegrowers. Extension of new and existing technology is essential for the adoption of new technology and best practice farming systems.

1.3 The delivery of an active pest and disease management program for the long term sustainability of the NSW sugar industry. NSW Cane Protection and Productivity Boards operate pest management programs in all 3 mill areas aimed at reducing losses from major pests and plant diseases. Significant productivity gains are gained through the

control of major pests and diseases and an active program of management in conjunction with canegrower members provides the best strategy.

1.4 The development of innovative new farming systems to provide long term yield gains and yield sustainability under the wet harvesting conditions experienced in NSW. The new farming system will be essential under the more trafficked conditions of whole of crop harvesting.

1.5 The delivery of an efficient plant breeding program to produce varieties suited to local conditions. New productive varieties are essential for the long term to provide members with new options for improving sugar yields.

2. COMMUNITY & ENVIRONMENT

2.1 The development and enhancement of industry and on-farm environmental awareness is a priority issue in the Co-operatives Strategic Plan.

2.2 The maintenance of a position of knowledge on local environmental issues such as acid sulfate soils and water quality. The acid sulfate soils and water quality initiatives have demonstrated that the industry can adopt a proactive stance on environmental issues and lead the way in management of major environmental issues.

2.3 The development of a good relationship with the community on aspects of cane growing and milling operations.

3. NEW BUSINESS

3.1 To aid development of the Joint Venture renewable electricity Co-generation project and the implementation of whole crop harvesting which will provide the benefits of a greater volume of renewable fuel and a reduction in cane burning.

3.2 Work on harvest and transport issues is essential for the success of the renewable electricity generation project. Additional funding for 2003/04 will be applied to this development work, particularly R & D to improve the bulk density of the cane and trash mixed product.