FINAL REPORT

GRDC
GRAINS RESEARCH & DEVELOPMENT CORPORATION

DAN01N

Regional Wheat Variety Trials - Central West

PROJECT DETAILS

PROJECT CODE:	DAN01N
PROJECT TITLE:	REGIONAL WHEAT VARIETY TRIALS - CENTRAL WEST
START DATE:	01.07.1989
END DATE:	30.06.1992
SUPERVISOR:	N A FETTELL (RESEARCH AGRONOMIST)
ORGANISATION:	NSW AGRICULTURE
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Summary

Field trials will be established on between 30 and 40 farmers properties each year to evaluate new and potential varieties against currently recommended standards. Wheat varieties will form the major part of the program, however there is also a need to examine varieties and management practices of alternative winter crops for wheat growers. Therefore the program includes an evaluation of varieties of other cereals, grain legumes and oilseeds as well as sowing dates, fertilisers and crop comparisons.

The project will employ a Technical Officer to operate a mobile unit to sow, spray and harvest the trials. The facilities of the Condobolin Agricultural Research and Advisory Station are available to support the operation of the unit.

Grain yield data and observations made during the growing season will be compiled into an annual report for use by plant breeders and advisory staff. Trial sites will be used for field days, and the mobile unit will assist extension officers by conducting crop management trials.

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Outcomes

Background

Due to there being no crop variety breeding programs located in the Central West environment (Condobolin, Forbes, Parkes and West Wyalong agronomy districts), there is a particular need to evaluate the suitability for this environment of crop varieties developed elsewhere. Funds provided for the project allow for a range of varietal trials for winter cereals and other winter crops that would not otherwise be possible. As well, a large number of crop management trials and demonstrations are conducted.

Funding allows continued full-time employment of a Technical Officer to conduct the trials and continued operation of a mobile unit which consists of small-plot field equipment transported on a low-loader to trial sites provided by co-operating farmers. Farmers' field equipment is generally too large to allow the number of trial replications necessary for statistically valid comparisons. The availability of the mobile unit also facilitates improved timeliness of field operations, which is often a problem due to farmers understandably giving greater priority to timeliness for their own crops rather than the trial crops they are accommodating. Funding also allows employment of casual assistance at peak periods which allows critical measurements to be undertaken. Project funding thereby substantially increases the confidence with which farmers in the Central West can be advised on the adoption of new varieties. It also expands the range of crops for which such advice can be given. An additional benefit may derive from the improved feedback to plant breeders regarding performance of varieties in the Central West, in terms of increased likelihood of varieties being bred with superior performance in this environment.

Aims

1. To service plant breeders by evaluating new varieties in the Central West.
2. To service the industry by evaluating currently recommended varieties.
3. To promote advanced practices and varieties by assisting agronomists in extension tasks throughout the Condobolin, Forbes, Parkes and West Wyalong agronomy districts.

Summary of Outcomes

- An on-farm trial program was conducted using a mobile unit and Technical Officer employed from project funds. Each year about 65 trials and demonstrations were completed, including variety trials for wheat, barley, oats, field peas, lupins, chickpeas, canola, linseed and lentils, and management experiments of fertiliser requirements, take-all control, pasture cleaning, herbicide sensitivity, pasture species and new crops such as oilseed mustard and linola.
- Results were communicated to farmers by field days at the experimental sites (over 20 each year) and by publication of an annual report including all trial results.
- The project was influential in the adoption of new varieties and of better farming practices, including the southern

expansion of Prime Hard wheat production, the increase in area of non-cereal crops and improved pasture and crop management. The value of the project was substantiated by economic assessment.

Discussion

Industry Significance

This project is an integral part of the wheat breeding programs for Central and Southern NSW and offers a service to agronomists and farmers by providing an assessment of promising varieties in commercial situations. Since there is no breeder located in Central Western NSW, data from this project is influential in determining cereal variety recommendations for the region. A range of other cereal, legume and oilseed crops are now being grown in the region and new varieties of these crops and suitable management practices will also be evaluated. Many trial sites will be used as field day sites to demonstrate forthcoming varieties to farmers.

Results

Mr Dougal Pottie has been employed as the Technical Officer operating the mobile unit since 1986. His skill and experience allowed the number of trials to be significantly increased during this three year period while still maintaining a very high standard of field work. The increase in total salary cost in 1991-92 was necessary to meet superannuation contributions.

The mobile unit based at Condobolin is equipped with a prime mover and trailer, tractor, cone seeder, plot harvester and 4WD utility fitted with a spray tank and boom. This machinery has been purchased as part of previous projects. In 1990-91, a capital allocation of $20 000 was used to replace the Navara 4WD with a Toyota Hilux. The new vehicle has proved to be very suitable for weed control operations.

An average of 65 trials and demonstrations were successfully completed each year, and a full listing is attached. These included variety trials for early and mid-season wheat, barley, oats, field peas, lupins, chickpeas, canola, linseed and lentils. Management trials and demonstrations included nitrogen fertiliser on wheat, cereal grazing, fertiliser on peas, winter cleaning of pastures, biological control of take-all, herbicide sensitivity in field pea, lupins and vetch, oilseed mustard, and pastures species comparisons.

This program played a leading role in a number of important changes in varieties and farming systems in the region. In the western area, testing of released and potential cultivars of wheat for yield and protein was crucial in the southern expansion of Prime Hard wheat production in the early 1990's. Throughout the region, the increase in new crops particularly canola and grain legumes has been hastened because of the demonstration and varietal testing of these crops by the mobile unit. The yield and quality data collected has been used to support the release of new cultivars, and also form the bases of varietal recommendations in the region.

The project also has a major extension role, and on average 21 field days were held at trial sites each year. As well, an annual report of 40 to 100 pages was compiled each year, and up to 1 000 copies circulated to extension and research officers and to farmers in the region. The full list of field days conducted and the co-operating farmer groups is attached.

An economic assessment of this project (Gains for Grain, GRDC, 1992) indicated an internal rate of return of 34% and a benefit cost ratio of 3.9, based only on the varietal improvement part of the project and including a NSW Agriculture contribution of over $70 000 annually. The assessment noted that these figures under-estimated the value of the program as the benefits from management trials (a major component of the project) were not included.

Ongoing Research

The mobile unit and Technical Officer have continued to be funded in the GRDC project DAN 80, “Development and promotion of improved crop varieties and agronomic practices for the Central West of NSW”. The title was changed to indicate the mix of variety testing and crop management trials conducted on-farm by the mobile unit.

Trial sites 1989

District	Co-operator and locality	Trial Type

Condobolin	G. Fishpool - Tottenham	Early sown wheat variety
		Main season wheat variety
		Barley variety
		Field pea variety
		Fertiliser (urea on wheat)
	I. Davis - Lake Cargelligo	Early sown wheat variety
		Main season wheat variety
	B. Colless - Vermont Hill	Grazing & grain oat variety
		Grain only oat variety
	M. Doyle - Euabalong	West Time of sowing in cereals
	B. Watt - Melrose High School	Chickpea variety
		Cereal grazing demonstration
	LIRAC - Condobolin	Interstate linseed variety
		Mixed grain legume
Forbes	B. Neville - Ooma	Early sown wheat variety
		Main season wheat variety
	K. Rawsthorne - Mulyandry	Early sown wheat variety
		Main season wheat variety
	W. Scott - Bogan Gate	Barley variety
	C. Hodges - Bogan Gate	Main season wheat variety
	P. Dwyer - Bogan Gate	Fertiliser on field peas
	W. Hodges -Bogan Gate	Cereals for grazing
	R. Redfern - Mulyandry	Cereals for grazing
	Sydney Uni - Forbes	Fertiliser (urea on wheat)
Parkes	B. Tanswell - Goonumbla	Early sown wheat variety
		Main season wheat variety
	A. Wright - Alectown West	Grain only oat variety
	B. Unger - Alectown West	Barley variety
		Chickpea variety

	W. Dunford - Gunningbland	Field pea variety
	J. Kearney - Trundle	Barley variety
		Main season wheat variety
West Wyalong	P. Wieneke - Girral	Lupin variety
		Early sown wheat variety
	L. Ward – Tullibigeal	Main season wheat variety
		Field pea variety
		Fertiliser (urea on wheat)
	R. Cooper - Weethalle	Early sown wheat variety
		Main season wheat variety
		Barley variety
	G. West - Lake Cowal	Grain only oat variety
	J. Templeton - Naradhan	Barley variety

Trial sites 1990

District	Co-operator and locality	Trial Type
Condobolin	G. Fishpool - Tottenham	Mid-season wheat variety
		Barley variety
		Field pea variety
		Nitrogen application on wheat
	I. Davis - Lake Cargelligo	Early sown wheat variety
		Mid-season wheat variety
		Nitrogen application on wheat
	M. Jones - Vermont Hill	Time of sowing in cereals
	M. Doyle - Euabalong West	Nitrogen application on wheat
	R. Martin - Fifield	Nitrogen application on wheat
	Condobolin High School	Winter crop demonstration
	Ag. Res. Stn. - Condobolin	Mid-season wheat variety
		Interstate linseed variety
	D. Carroll - Burgooney	Grain oat variety

	J. Hill - Tullibigeal	Barley variety
		Field pea variety
		Nitrogen application on wheat
Forbes	B. Neville - Ooma	Early sown wheat variety
		Mid-season wheat variety
	K. Rawsthorne - Mulyandry	Early sown wheat variety
	R. Redfern - Mulyandry	Cereals for grazing
	W. Hodges - Bogan Gate	Cereals for grazing
	C. Hodges - Bogan Gate	Mid-season wheat variety
	W. Scott - Bogan Gate	Barley variety
	Uni. of Sydney - Cowra Rd.	Chickpea variety
		Lentil variety
Parkes	B. Tanswell - Goonumbla	Early sown wheat variety
		Mid-season wheat variety
		Barley variety
		Winter cleaning of pastures demonstration
	B. Unger - Alectown West	Barley variety
		Chickpea variety
	W. Dunford - Gunningbland	Field pea variety
		Field pea sowing rate
		Herbicide sensitivity on peas
		Nitrogen application on wheat
		Lentil and chickpea demonstration
	G. Somers - Goobang	Canola variety
	G. Hunter - Bogan Gate	Lupin variety
	A. Rees - Numulla	Mid-season wheat variety
		Vetch and field pea demonstration
	J. Kearney - Trundle	Mid-season wheat variety
		Winter cleaning of pastures demonstration

	G. Wright - Alectown	Grain oat variety
	K. Keith - Parkes	Winter cleaning of pastures demonstration
	J. Rhodes - Gunningbland	Winter cleaning of pastures demonstration
	I. Unger - Aleetown	Winter cleaning of pastures demonstration
West Wyalong	L. Woolner - Weethalle	Early sown wheat variety
		Mid-season wheat variety
		Barley variety
	R. Tait - Weethalle	Grazing and grain oat variety
	P. Wiencke - Girral	Lupin variety
	B. Keir - Quandialla	Grazing and grain oat variety
	J. Templeton - Naradhan	Early sown wheat variety
		Mid-season wheat variety
	G. West - Lake Cowal	Grain oat variety
		Early sown wheat variety
	W. Buttenshaw - Lake Cowal	Canola demonstration

Trial sites 1991

District	**Co-operator and locality**	**Trail Type**
Condobolin	G. Fishpool - Tottenham	Early sown wheat variety
		Main season wheat variety
		Barley variety
		Field pea variety
		Wheat nitrogen nutrition
		Winter cleaning of pasture demonstration
	I. Davis - Lake Cargelligo	Early sown wheat variety
		Main season wheat variety
		Canola variety
		Winter cleaning of pasture demonstration

	T. Mackin - Tullibigeal	Barley variety
		Field pea variety
		Wheat nitrogen nutrition
		Winter cleaning of pasture demonstration
	Ag. Res. Stn. - Condobolin	Early sown wheat variety
		Main season wheat variety
		Winter cleaning of pasture demonstration
	D. Carroll - Burgooney	Grain only oat variety
	Condobolin High School	Winter crop demonstration
	S. Edwards - Tottenham	Winter cleaning of pasture demonstration
	R. Jelbart - Wilga Ridge	Winter cleaning of pasture demonstration
	A. Jarvis - Albert	Winter cleaning of pasture demonstration
	C. Vincent - Tottenham	Winter cleaning of pasture demonstration
	J. Greig - Ootha	Winter cleaning of pasture demonstration
Forbes	R. Redfern - Mulyandry	Cereals for grazing and grain
	A. Noble - Eugowra	Canola variety
	K. Rawsthorne - Mulyandry	Early sown wheat variety
		Main season wheat variety
		Biological control of Take-all
	University of Sydney	Chickpea variety
	W. Hodges - Bogan Gate	Cereal comparison
	B. Neville - Ooma	Early sown wheat variety
		Main season wheat variety
	W. Scott - Bogan Gate	Barley variety
	C. Hodges - Bogan Gate	Main season wheat variety
		Lentil variety
Parkes	R. Umbers - Trundle	Main season wheat variety
		Barley variety
		Canola demonstration

G. Pietsch - Alagala	Main season wheat variety
	Barley variety
	Alternative crop demonstration
	Winter cleaning of pasture demonstration
B. Tanswell - Goonumbla	Early sown wheat variety
	Main season wheat variety
	Canola, chickpea and vetch demonstration
B. Unger - Alectown West	Barley variety
	Grain only oat variety
W. Dunford - Gunningbland	Field pea variety
	Field pea herbicide sensitivity
	Vetch herbicide sensitivity
	Lentil and chickpea demonstration
	Peaola demonstration
	Wheat nitrogen nutrition
	Field pea phosphorus nutrition
	Winter cleaning of pasture demonstration
G. Somers - Goobang	Canola variety
	Canola herbicide sensitivity
	Wheat nitrogen nutrition
	Chickpea and vetch demonstration
G. Hunter - Bogan Gate	Lupin variety
	Vetch demonstration
	Winter cleaning of pasture demonstration
G. Toohey - The Troffs	Grain legume crop comparison
G. Wright - Alectown West	Chickpea variety
	Vetch demonstration
W. Rathbone - Alagala	Winter cleaning of pasture demonstration
J. Kearney - Trundle	Winter cleaning of pasture demonstration
N & S Macaulay - Goobang	Winter cleaning of pasture demonstration

	I. Unger - Alectown	Winter cleaning of pasture demonstration
West Wyalong	A. Maitland - Wyalong	Biological control of Take-all
	L. Woolner - Weethalle	Early sown wheat variety
		Main season wheat variety
		Barley variety
	R. Tait - Weethalle	Grazing and grain oat variety
		Chickpea variety
	P. Wiencke - Girral	Lupin variety
		Field pea variety
	G. West - Lake Cowal	Early sown wheat variety
		Grain only oat variety
	J. Templeton - Naradhan	Early sown wheat variety
		Main season wheat variety

Trial sites 1992

District	Co-operator and locality	Trial Type
Condobolin	D. Fox-Ashwin - Tottenham	Wheat and barley for early sowing
		Main season wheat
		Main season barley variety
		Field pea variety
	I. Davis - Lake Cargelligo	Wheat and barley for early sowing
		Main season wheat
		Oilseed mustard variety
		Pasture species demonstration
	T. Mackin - Tullibigeal	Main season barley variety
		Field pea variety
		Nitrogen fertiliser in wheat
		Pastures species demonstration
		Oilseed mustard demonstration

	Ag. Res. Stn. - Condobolin	Early sown wheat variety
		Main season wheat variety
	D. Carroll - Burgooney	Grain only oat variety
	M. Doyle - Euabalong West	Mixed cereals
		Pasture species demonstration
	M. Jones - Vermont Hill	Mixed cereals
		Pasture species demonstration
		Oilseed mustard demonstration
	A. Larkings - Tullamore	S2 Barley variety
	K. Fair - Lake Brewster	Oilseed mustard variety
		Crop response to C.C.N.
		Pasture species demonstration
		Take-all control in wheat
	Condobolin High School	Winter crop demonstration
Forbes	R. Redfern – Mulyandry	Oats for grazing and grain
	A. Noble - Eugowra	Canola variety
		Canola nutrition
	K. Rawsthorne - Mulyandry	Early sown wheat and barley variety
		Main season wheat variety
		Take-all control in wheat
	L. Neville - Ooma	Wheat and barley for early sowing
		Main season wheat
	W. Hodges - Bogan Gate	Oats for grazing and grain
	C. Hodges - Bogan Gate	Main season wheat
	W. Scott - Bogan Gate	Main season barley variety
	A. McDonald - Warroo	Take-all control in wheat

Parkes	W. Dunford - Gunningbland	Field pea variety
		Grain legume crop comparison
		Herbicide sensitivity in vetch
		Herbicide sensitivity in peas
	G. Somers - Goobang	Canola variety
	G. Hunter - Bogan Gate	Lupin variety
		Herbicide sensitivity in lupins
	R. Jelbart – Alectown	Canola nutrition
	B. Tanswell - Goonumbla	Wheat & barley for early sowing
		Main season wheat
		Canola demonstration
		Pasture species demonstration
		Winter cleaning of pasture demonstration
	J. Kearney - Trundle	Main season wheat
		Main season barley variety
		Winter cleaning of pasture demonstration
	G. Pietsch - Alagala	Main season wheat
		Main season barley variety
		Winter cleaning of pasture demonstration
	N. Macaulay - Goobang	Grain only oat variety
		Grain legume crop comparison
	B. Unger - Alectown	S3 Barley variety
		Chickpea variety
West Wyalong	G. West - Lake Cowal	Wheat for early sowing
		Grain only oat variety
	R. Tait - Weethalle	Oats for grazing and grain
		Chickpea variety
		Pasture species trial

J. Templeton - Naradhan	Wheat & barley for early sowing
	Main season wheat
L. Woolner - Weethalle	Wheat & barley for early sowing
	Main season wheat
	S3 Barley variety
P. Wiencke - Girral	Lupin variety
	Field pea variety
M. Stockman - Gubbata	Take-all control in wheat
M. Manglesdorf - Lake Cowal	Pasture species demonstration

Field Days at Trial Sites

Field days for the farming community were held in October-November each year. The program for each locality was organised co-operatively between the NSW Agriculture District Agronomist and the local farmer group; usually a branch of NSW Farmers or Agricultural Bureau.

Field day sites

District	Organisation	Co-operating Farmers and Year
Condobolin	Top Woodlands Ag. Bureau	Fishpool 1989, 90, 91
		Fox-Ashwin 1992
	Lake Cargelligo	Davis 1989-92
	NSW Farmers Branch	
	Tullibigeal	Mackin 1989-92
	NSW Farmers Branch	
	Local Farmer Group	Doyle, Euabalong West
		1989, 90, 92
	Local Farmer Group	Jones, Vermont Hill
		1989
	NSW Agriculture	Agricultural Research and
		Advisory Station: annually
Forbes	Gunning Gap Agricultural Bureau	Scott, Hodges, Dwyer,
		1989-92

	Mulyandry	Rawsthorne, Redfern
	NSW Farmers Branch	1989-92
	Ooma	Neville 1989-92
	NSW Farmers Branch	
	Lachlan Irrigation Research and Advisory Council (LIRAC)	LIRAC Research Farm
		1989-92
Parkes	Australian Pulse Co-operative	Dunford 1990-92
	NSW Agriculture	Somers 1990-92
	Alectown	Jelbart 1991-92
	NSW Farmers Branch	Unger 1989-92
	NSW Agriculture	Hunter 1990-92
	NSW Agriculture	Tanswell 1989-92
	NSW Agriculture	Kearney 1989-92
		Umbers 1991
	NSW Agriculture Hoechst	Pietsch 1989-92
	Parkes Agricultural Bureau	Macaulay 1992
West Wyalong	West Wyalong Agricultural Bureau	West 1989-92
	Walker's Ag-N-Vet	
	Weethalle	Tait 1989-92
	NSW Farmers Branch	Woolner 1990-92
		Cooper 1989
	Ungarie	Wiencke 1989-92
	NSW Farmers Branch	
	Naradhan, Gubbatta and Kikiora NSW Farmers Branch	Templeton 1989-92
		Stockman 1992