

Project planning meeting 4-8 Sept 2005, ICARDA, Aleppo, Syria

Minutes and 2005/06 Workplan

Iraq-ICARDA-Australia Project (Better crop germplasm and management for improved production of wheat, barley and pulse and forage legumes in Iraq (ACIAR CIM/2004/024))

Summary of the meeting

A project planning meeting for the Iraq-ICARDA-Australia Project on “Better crop germplasm and management for improved production of wheat, barley and pulse and forage legumes in Iraq” was held at ICARDA on 4-8 September 2005. The project is funded by ACIAR/AusAID as part of the Australian contribution to the rehabilitation of Iraq. It is being implemented in Ninevah Governorate, where ICARDA and Australian groups have been active in the past.

The meeting aimed to develop a detailed workplan for the research and demonstration program in the 2005/06 growing season. There were 7 participants from Iraq (2 from Baghdad, 5 from Mosul), 3 from Australia and some 20 from ICARDA.

After the official opening, when participants were welcomed by Acting ICARDA DG Mr Michel Valat, there were presentations reviewing background information on dryland cropping in Ninivah Governorate and preliminary outcomes from the baseline survey. These were excellent background for the working group sessions which identified the “best bet” varieties/lines and technologies to be tested in the demonstration program and the experimental varieties/lines and technologies to be investigated in the research program of the project. The demonstration and research programs will be implemented by staff of the Directorate of Agriculture in the four important agro-climatic zones with high, medium, and low rainfall and access to supplementary irrigation.

There was great interest in the series of four lunch-time seminars highlighting advances in cropping technologies in Mediterranean areas of Australia in the ICARDA auditorium. These were well attended by some 40-50 scientists from project group and ICARDA. They were designed to expose and discuss new technologies being researched and taken up by Australian farmers which might be of interest for the Iraq project. These seminars were on:

- A decade of research on cool season grain legumes in dryland environments of Australia: Lessons learned - Professor Kadambot Siddique, Director, Centre for Legumes in Mediterranean Agriculture (CLIMA), Uni of Western Australia
- Cereal improvement in Australia – Dr Reg Lance, Barley Breeder, Department of Agriculture Western Australia
- New horizons for farming systems suited to Southern Australia – Dr David Coventry, Professor of Sustainable Agriculture, University of Adelaide
- The benefits and challenges of crop-pasture-livestock integration in Australian agriculture - Professor Kadambot Siddique.

The meeting was very successful and developed agreed workplans which, although ambitious, were considered manageable. Sites and teams to implement the work have been selected in Ninevah and, given the strong commitment by the Iraqi group to the project and the well-discussed and agreed workplans for 2005/06, it is expected that good progress can be made towards identifying and promoting some really useful varieties and technologies cropping farmers in Ninevah Governorate. The tragic loss of the Iraqi project director Dr Awad Abbas following the meeting (mentioned elsewhere in this newsletter) strengthens everyone's resolve to make this project successful. This would be a tribute to Dr Awad and what he would have wanted.

Items arising from the meeting for immediate action

- | | |
|--|---------------------------------|
| 1. Complete baseline survey analysis and report | Drs Shideed, Al-Niami, Abdullah |
| 2. Quote/purchase of seed cleaner and ZT drills | Drs Bishaw, Piggin |
| 3. Canvass surplus R & D equipment at AgWA | Dr Reg Lance |
| 4. MOA to confirm training courses/participants | Dr Saleh Bader |
| 5. Prepare/dispatch R & D seed to Mosul | Dr Bishaw + ICARDA scientists |
| 6. Provide location coordinates/map of sites | Dr Abdul Sattar Al-Rajbu |
| 7. Review of crop literature relevant to Ninevah | Drs Adary, Kasim |
| 8. Bank details and procedures for transfer of funds | Drs Bader, Al-Rajbu and MOA |
| 9. Prepare sites and seed for planting | Dr Al-Rajbu and DOA Ninevah |
| 10. Plant and measure demos/trials as planned | Dr Al-Rajbu and DOA Ninevah |

Meeting Purpose

The meeting was an agreed activity in the project document and aimed to develop the workplan for the research and demonstration program in the 2005/06 growing season. The detailed objectives of the meeting were to:

- review the agricultural and R&D situation and available background information in Ninevah
- present preliminary results of Ninevah baseline survey
- develop detailed workplans for legume, cereal and crop management R & D
- discuss seed production, training and capital requirements
- discuss project operations, finances, reporting
- present seminars of relevance to Iraq on advances in cereal and legume improvement, crop management and crop-livestock interactions in Australia
- discuss MOA desires for develop strategies and proposals to assist with rehabilitation of seed production, plant genetic resource, and research station infrastructure and facilities
- agree on the timing of the second annual planning meeting

Planned outputs from the meeting were:

- agreed detailed workplan compatible with:
 - objectives, outputs (Table 3.2), activities (3.3a Flow chart) and budget
 - resources
 - prevailing situation in Iraq
- an understanding and strategy to implement the workplan
- identification of responsible persons for activities and outputs (reporting)

The Meeting

The meeting was held over five days at ICARDA. The agenda is in Appendix 1. There were 7 participants from Iraq (2 from Baghdad, 5 from Mosul), 3 from Australia and some 20 from ICARDA (see Appendix 2).

After the official opening, when participants were welcomed by Acting ICARDA DG Mr Michel Valat, there were presentations on the background and preliminary outcomes of

the baseline survey. These were excellent background for the working group sessions, especially for the Australians who did not attend the July pre-planning meeting.

Discussion group sessions were then held to identify the “best bet” varieties/lines and technologies to be demonstrated under Objective 1 and the experimental varieties/lines and technologies to be investigated under Objectives 2 and 3. The agreed workplan is detailed below under cereals, legumes and crop management.

Seminar series

A series of 4 lunch-time seminars highlighting advances in cropping technologies in Mediterranean areas of Australia were held over four days (Sunday-Wednesday) in the ICARDA auditorium. These were well attended by some 40-50 scientists from project group and ICARDA. They were designed to expose and discuss new technologies being researched and taken up by Australian farmers which might be of interest for the Iraq project. Details were as follows:

- A decade of research on cool season grain legumes in dryland environments of Australia: Lessons learned - Professor Kadambot Siddique, Director, Centre for Legumes in Mediterranean Agriculture (CLIMA), Uni of Western Australia
- Cereal improvement in Australia – Dr Reg Lance, Barley Breeder, Department of Agriculture Western Australia
- New horizons for farming systems suited to Southern Australia – Dr David Coventry, Professor of Sustainable Agriculture, University of Adelaide
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Baseline survey

There has been excellent progress with the baseline survey under the leadership of Drs, Al-Naimi, Abdullah and Shideed. Some 260 farmers were surveyed using the questionnaire designed at the July meeting. The MOA socio-economics group in Baghdad assisted with analysis, which has only been partially completed. Dr Al-Naimi gave a detailed report of the survey outcomes to date. The survey analysis and report will be completed as soon as possible under the guidance of Drs Shideed, Salem Al-Naimi and Emad Abdullah and will be a valuable background resource in implementing and evaluating the project.

Budget and finance

It was decided in the July 05 inception/planning meeting to transfer some Iraq funds in the budget from Capital Items to Operating Expenses. Following further consideration in Baghdad, the Iraqi group advised that they would now prefer to revert to the original budget. This means there will be A\$356,660 for capital items and refurbishment and \$66,500 per year (for a total of \$199,500 over 3 years) for operating expenses. The MOA will provide details to ICARDA of the project bank account and procedures for transfer of funds.

Capital items/refurbishment

It was agreed that \$356,660 would be allocated as per the budget for capital items and refurbishment. Priorities were discussed and agreed as follows:

1. Seed cleaning machine (1 t/hr)
2. Research plot seed drill (Wintersteiger?)
3. Zero-till seed/fertilizer drill.

ICARDA will investigate prices and arrange purchase in conjunction with the MOA Iraq. Realistically, it is unlikely that much of this could be available in Iraq for the 2005/06 cropping season.

Dr Reg Lance suggested that there might be some surplus crop research and demonstration equipment and machinery available through the Department of Agriculture in Western Australia. Reg will investigate and interact on this.

Training

The training plan provides for 23 trainees per year to make short-term visits to ICARDA and for one study visit per annum to CLIMA, DAWA or UniAdelaide. Training needs were discussed in relation to the courses offered at ICARDA, with the Iraqi delegation indicating they would be interested to send trainees to participate in courses 4 to 24 in the list in Appendix 3. This will be confirmed by the MOA in writing to ICARDA.

MOA-ICARDA Memorandum of Understanding

The signed MOA-ICARDA agreement was delivered by the Iraq delegation to ICARDA.

Best bet varieties/lines and technologies for research and demonstration

The best bet varieties/lines and technologies for testing in demonstrations and research trials which were identified and agreed on are listed below for the 4 agro-climatic zones – high rainfall areas (HRA), medium rainfall areas (MRA), low rainfall areas (MRA), supplementary irrigation (SI). These have formed the basis for calculating seed requirements (Appendix 4) – and it was agreed that the involved scientists and the Seed Unit would prepare and assemble all the seed required from ICARDA and despatch it by road to Mosul by mid-October, under the coordination of Dr Zewdie Bishaw. The seed requirements are detailed in Appendix 3.

In the first meeting of the project collaborators in Ninevah on 29 July 2005, relevant divisions were asked to prepare plots in farmer's fields with an area of no less than 200 dunum (50ha) and prepare a list of farmers who want to participate in the implementation of the project. This area will be the site of the demonstrations and research trials in each of the locations listed below. Soil samples were collected from these sites and handed to the MOA laboratory for soil analysis (Minutes of Project meeting, Ninevah, 4 August 2005). The Ninevah Directorate group also indicated that research and extension teams had been assigned for each Agricultural Division and will work together to implement the project.

As far as possible given conditions in Iraq, the trials and demonstrations will be sown after rains in Nov-Dec and follow the following guidelines:

Demonstrations

- All demonstrations in farmer fields
- Farmer participation in technology evaluation (Farmers Field Schools or Farmers Interest Groups)
- 3 locations per environment (HRA: Al-Shekhan, Rabiah, Al-Koush; MRA: Al-Hamadaniah, Tel-Kef, Basheeka; LRA: Tel-Abta, Al-Hadar, Al-Mahlabiah); SI (Rabiah, Al-Namroud, Hmeidat). It was agreed it would be very useful if the locations and coordinates of these locations could be provided on a map by the MOA Iraq.
- Areas of up to 1ha per treatment (adjusted depending on available land)
- Farmers' input in management together with research/extension team

Research

- 3 research stations/sites – one in each zone [Rashidia (MRA), Tel Afer (LRA), suitable farmers field (HRA)]
- Farmer participation in technology evaluation
- Researcher's management with extension and farmer guidance

Variety/line testing

1) Cereals

Testing locations:

	HRA	MRA	LRA	SI
Barley		x	x	
Bread wheat	x	x		x
Durum wheat	x	x		x

1.1 Demonstrations

1.1a) barley

MRA	LRA
Rihane-03	Zanbaka
Furat 1	Tadmor
Gezira 1	Local
Local	

1.1b) durum wheat

HRA	MRA	SI
Waha	Omrabia 5	Omrabia 5
Cham 3	Cham 5	Cham 3
Garonia (local)	Garonia (local)	Garonia (local)

1.1c) bread wheat

HRA	MRA	SI
AboGhraib 3	AboGhraib 3	Cham 4
Cham 6	Adnanya	AboGhraib 3
Cham 4	Tel Affer 3	Adnanya
	Cham 6	Cham 6
	IPA 99	Tel Affer 3

1.2 Research – Promising lines

Nursery evaluations will be conducted as follows:

1.2a) barley

MRA	LRA
MRA barley nursery (100 entries, 2 row black/6 row white) - Telkef, Hamadaniah (farmer fields) - Rashidya, Namroud (research stations)	LRA barley nursery (100 entries, 2 row, black seeded) – Al-Hadar, Tel Abta (farmer fields)

1.2b) durum wheat

HRA	MRA	SI
CWANA favorable areas DW SN (140 entries + checks) - Al-Koush (farmer field)	CWANA dryland DW SN - Rashidya (research stn)	CWANA favorable areas DW SN (140 entries + checks) - Al-Namroud (research stn)

1.2c) bread wheat

HRA	MRA	SI
CWANA low latitude SBW SN (140 entries + checks) - Al-Koush (farmer field)	CWANA Dryland SBW SN (81 entries + checks) - Telkef, Hamadaniah, Basheeka (farmer fields) - Rashidya, Namroud (research stations)	CWANA low latitude SBW SN (140 entries + checks) - Al-Namroud (farmer field)

2) Food legumes

Varieties and lines for demonstrations and research trials are specified below. All varieties mentioned in HRA and MRA could be tested under SI.

2.a) chickpea

	Seed to be provided by ICARDA (Kg)	HRA (No SI required)	MRA (with SI as required)	LRA	SI
Demos	50 400 2000	Dijla (FLIP 3279) 510 IPA (FLIP 86-05) Ghab 4 (FLIP 93-93)	Dijla (FLIP 3279) IPA 510 (FLIP 86-05) Ghab 4 (FLIP 93-93)		
Research	Will be increased 2005 season at ICARDA 20 kg each line from ICARDA Based on Terbol Harvest ICARDA to provide	Aust. lines FLIP 97-530CLIMAS (Almaz) FLIP 97-503 CLIMAS (Nafice) On-farm lines (SYRIA)-AB lines FLIP 97-588 FLIP 97-677 FLIP 97-706 FLIP 97-657 Combined (AB& FW) Gaby Khalaf to provide list and arrange seed multiplication at ICARDA during 2005. Lines will be available for 2006. Chickpea international stress nurseries (FW,AB, Cold, Drought) and adaptation trials (CIEN winter and spring). Two sets for at least one site	FLIP 97-530 CLIMAS (Almaz) FLIP 97-503 CLIMAS (Nafice) On-farm lines (SYRIA)-AB lines FLIP 97-588 FLIP 97-677 FLIP 97-706 FLIP 97-657 Combined (AB& FW) Gaby Khalaf to provide list and arrange seed multiplication at ICARDA during 2005. Lines will be available for 2006.		

2.b) lentil

	Seed to be provided by ICARDA (Kg)	HRA	MRA	LRA	SI
Demo	100 500 100		Baraka (Idlib 1) IPA 98 (Idlib 2) Idlib 3	Baraka (Idlib 1) IPA 98 (Idlib 2) Idlib 3	
Research	5 5 5 5 kg for each line		Baraka Idlib 3, IPA 98 (Idlib 2) ILL 590, 6829, 7012*, 7978, 7979, 8090, 9902, 9938, 9939, 9962, 9980, 9998	Baraka Idlib, 3, IPA 98 (Idlib 2) ILL 590, 6829, 7012*., 7978, 7979, 8090, 9902, 9938, 9939, 9962, 9980, 9998	

*old seed - germination test will be done at ICARDA and clean seed will be provided.

** lentil international nurseries from 2004 are already with Iraq for 2005

2.c) faba bean

	Seed (kg) to be provided by ICARDA	HRA	MRA	LRA	SI
Demos	80 80	Aquadulce ILB 1814			
Research	5 kg each 200 seeds per variety 200 seeds per line ICARDA to provide	<p>ILB1814 selections: ILB1814-L-2 ILB1814-L-12 ILB 1814-L-62 ILB 1814-L-63 ILB 1814-L-86</p> <p>Aust. varieties : Fiesta, Ascot, Cairo, Farah</p> <p>15 lines with high auto-fertility Sel 97/ Lat 97 92-1 Sel -F6 / 1431 / 2003 Sel -F6 / 1432 / 2003 Sel -F6 / 1433 / 2003 Sel -F6 / 1434 / 2003 -2 Sel -F6 / 1435 / 2003 Sel -F6 / 1438 / 2003 -1 Sel -F6 / 1438 / 2003 -2 Sel -F6 / 1441 / 2003 -2 Sel -F6 / 1443 / 2003 Sel -F6 / 1444 / 2003 Sel -F6 / 1445 / 2003 Sel 97 Lat 97 95-1 Sel 97 Lat 97 / 95 -3 Sel 97 Lat 97 97-2</p> <p>3 international faba bean nurseries 2006 (CS, AB, improved populations) will be provided (2 sets of each for 2 locations)</p>			

3) Forage legumes – Vicia

	Seed (kg) provided by ICARDA	Species	HRA Seed	MRA Seed + hay	LRA Feed (grazing)	SI
Demos	(Iraq) 50 150	<i>V. sativa</i>	715-Baraka #2220	IPA 2001 #713	IPA 2001 #713	
	150	<i>V. dasycarpa</i>		Kouhak	Kouhak	
	150	<i>V. narbonensis</i>		Velox	Velox	
	50 50	<i>L. sativus</i>		Ali-bar #587	Ali-bar #587	
Research	3 sets each	International nurseries		IFLVS IFLVE IFLALS	IFLVS IFLVE IFLALS	

General notes on cereal and legume adaptation trials and demonstrations:

1. All demonstration (3 per zone) and research trials (at least 1 per zone) will be conducted in the agro-climatic zones identified
2. In order to demonstrate the beneficial effect of legume to the following cereal crops each demonstration sites should include appropriate cereal and fallow phase of the rotation. This will help to establish appropriate crop rotations and assess the value of legumes in the following season
3. Demonstrations should include comparisons of new varieties and farmers varieties with improved and local packages if possible.
4. Sowing dates: chickpea (last week of December); lentil (last week of November); faba bean (early November); forage legumes (last week of November), cereals (mid-December).
5. Seed rate: chickpea (120 kg/ha); lentil (120 kg/ha); faba bean (120 kg/ha); forage legumes (*V.sativa* 100kg/ha; *V. dasycarpa* 80 kg/ha; *L. sativus* 100 kg/ha; *V. narbonensis* 120 kg/ha), barley (120 kg/ha), durum wheat (140 kg/ha), bread wheat (120 kg/ha).
6. Plot size for demonstrations (0.5 to 1 ha) will be decided by Iraqi scientists based on the availability of land at each site. The international nurseries have clear instructions on the number of rows and row length etc in the package.

4) Crop management

Crop management demonstrations may be large in area and it may not be possible to run them in 3 locations in each agro-climatic zone. It is planned that there will be at least one in each zone and more if appropriate and manageable.

4.1 Demonstrations

Issues addressed	HRA (no fallow used)	MRA (25% fallow used)	LRA (50% fallow used)
1. Tillage/sowing			
<p>1. Farmers' practice</p> <ul style="list-style-type: none"> - Late sowing - Non-uniformity of seeds - Late emergence - Soil degradation 	<p>1. Moldboard after harvest of chickpea + broadcast seed and fertilizer + cover with one way disk after rain (~Dec 15) (160 kg seed/ha)</p>	<p>1. One way disk after harvest of lentil+ broadcast seed and fertilizer + cover with one way disk after rain (~Dec 15) (160 kg seed/ha)</p>	<p>1. One way disk after vetch grazing in early May + broadcast seed + cover with one way disk before rain (~Nov 15) (120 kg seed/ha)</p>
<p>2. Modified Tillage:</p> <ul style="list-style-type: none"> - Better soil structure - Uniform seed distribution - Early emergence [For (a) and (b)] - Lower seed rate [For (a) and (d)] - Less pest incidence [For (a) and (b)] 	<p>2.a. Chisel (20 cm) after harvest of chickpea + Ducks-foot plow before rain (12 cm) + drill before rain (~ Nov 15) (120 kg seed/ha at 4-5 cm seed depth for all)</p> <p>2.b. The same as (a) above with 160 kg seed/ha</p> <p>2.c. Chisel (20 cm)) after harvest of chickpea + Ducks-foot after rain (12 cm) + drill after rain (~ Dec 15) (120 kg seed/ha)</p> <p>2.d. The same as (c) above with 160 kg seed/ha</p>	<p>2.a. Chisel (20 cm) after harvest of lentil + Ducks-foot plow before rain (12 cm) + drill before rain (~ Nov 15) (120 kg seed/ha)</p> <p>2.b. The same as (a) above with 160 kg seed/ha</p> <p>2.c. Chisel (20 cm) after harvest of lentil + Ducks-foot after rain (12 cm) + drill after rain (~ Dec 15) (120 kg seed/ha)</p> <p>2.d. The same as (c) above with 160 kg seed/ha</p>	<p>2. Chisel (20 cm) after harvest of vetch + Ducks-foot plow before rain (12 cm) + drill before rain (~ Nov 15) (120 kg seed/ha)</p> <p>3. One way disk after harvest of vetch + drill before rain (~ Nov 15) (120 kg seed/ha)</p>
Recommended management for tillage/sowing demonstration			
Varieties	Abu Graib 3 or Cham 6 (Bread wheat)/Ghab 4	Waha or Om Rabia 5 (Durum wheat)/Idleb 3	A. Aswad (Barley)/IPA 2001
Fertilizers	100 kg DAP + 90 kg Urea at planting + 90 kg Urea/ha as top dressing	60 kg DAP + 30 kg Urea at planting + 30 kg Urea/ha as top dressing	Nil
Weed Control	Chevalier (20 g ai/ha) as early post-em	Chevalier (20 g ai/ha) as early post-em	Nil

Issues addressed	HRA (no fallow used)	MRA (25% fallow used)	LRA (50% fallow used)
2. Fertilizers for wheat in HRA and MRA and barley for LRA Issues with fertilizers: -Availability - Limited production with mostly import - LRA is not fertilized	1. Recommended (100 kg DAP-18-46% / ha + 90 kg urea-46% at planting + 90 kg Urea/ha as top dressing) 2. Recommended (100 kg DAP-18-46% / ha at planting + 90 kg urea/ha as top dressing) 3. Half the recommended package under 1. (50 kg DAP/ha + 45 kg urea at planting + 45 kg urea/ha as top dressing) 4. None	1. Recommended (60 kg DAP-18-46% / ha + 30 kg urea46% at planting + 30 kg Urea/ha as top dressing) 2. Recommended (60 kg DAP-18-46% / ha at planting + 30 kg urea/ha as top dressing) 3. Half the recommended package under 1. (30 kg DAP/ha + 15 kg urea/ha at planting + 15 kg urea/ha as top dressing) 4. None	1. Recommended (50 kg DAP-18-46% / ha + 15 kg urea46% at planting + 15 kg Urea/ha as top dressing) 2. Recommended (50 kg DAP-18-46% / ha at planting + 15 kg urea/ha as top dressing) 3. Half the recommended package under 1. (25 kg DAP/ha + 8 kg urea/ha at planting + 8 kg urea/ha as top dressing) 4. None
Recommended farmer management for fertilizer trials			
Tillage	Moldboard after harvest of chickpea + + Ducks-foot after rain (12 cm) + drill after rain (~ Dec 15) (120 kg seed/ha)	Chisel after harvest of lentil + Ducks-foot after rain (12 cm) + drill after rain (~ Dec 15) (120 kg seed/ha)	Chisel after harvest of vetch + Ducks-foot after rain (12 cm) + drill before rain (~ Nov 15) (120 kg seed/ha)
Varieties	Abu Graib 3 or Cham 6 (Bread wheat)/Ghab 4	Waha or Om Rabia 5 (Durum wheat)/Idleb 3	A. Aswad (Barley)/IPA 2001
Weed Control	Chevalier (20 g ai/ha) as early post-em	Chevalier (20 g ai/ha) as early post-em	Nil
3. Weed Control (Wheat)	-/+ herbicides (Chevalier: 20 g ai/ha)	-/+ herbicides (Chevalier: 20 g ai/ha)	Nil
Herbicide application will be imposed on farmers' fields with monitoring of management practices (tillage, variety, fertilizer use at each zone)			
4. Weed Control (Food legumes)	1. mechanical control (pair row planting) 2. hand weeding 3. chemical (Challenge + Fusilade) 4. control	1. mechanical control (pair row planting) 2. hand weeding 3. chemical (Challenge + Fusilade) 4. control	
Recommended farmer management for weed control trials			
Tillage	Moldboard after wheat	Chisel after wheat (20 cm)	

Issues addressed	HRA (no fallow used)	MRA (25% fallow used)	LRA (50% fallow used)
	(20 cm) + cultivator (10-12 cm) after rain + planting by drill (end December; 120 kg seed/ha)	+ cultivator (10-12 cm) after rain + planting by drill (end November; 100 kg seed/ha)	
Varieties	Chickpea (Ghab 4)	Lentil (Idleb 3)	

4.2 Research

Conservation tillage Cereal/legume rotations by two phases - Large plots (15*30 m) ? - 4 replicates - Plant protection staff should be involved throughout the exp period	1. Conventional disk (+/- stubble) 2. Conventional mouldboard plow (+/- stubble) 3. Minimum tillage (+/- stubble) 4. Zero tillage (+/- stubble) 5. Zero tillage (+/- stubble) (1st yr : 7.5-10 t/ha gypsum + Deep tillage by Chisel at 20 cm)	1. Conventional disk (+/- stubble) 2. Conventional mouldboard plow (+/- stubble) 3. Minimum tillage (+/- stubble) 4. Zero tillage (+/- stubble) 5. Zero tillage (+/- stubble) (1st yr : 7.5-10 t/ha gypsum + Deep tillage by Chisel at 20 cm)	1. Conventional disk (+/- stubble) 2. Conventional mouldboard plow (+/- stubble) 3. Minimum tillage (+/- stubble) 4. Zero tillage (+/- stubble) 5. Zero tillage (+/- stubble) (1st yr : 7.5-10 t/ha gypsum + Deep tillage by Chisel at 20 cm)
Recommended management of conservation tillage trials			
Varieties	Wheat/chickpea (Abu Graib/ Ghab 4)	Wheat/lentil Om Rabia/Idleb 3	Barley/lentil A. Aswad/Idleb 2
Fertilizer (wheat)	100 kg DAP-18-46% / ha at planting + 90 kg Urea/ha as top dressing	60 kg DAP-18-46% / ha at planting + 30 kg Urea/ha as top dressing	50 kg DAP-18-46% / ha at planting + 15 kg Urea/ha as top dressing
Fertilizer (legume)	50 kg DAP/ha planting	50 kg DAP/ha planting	50 kg DAP/ha planting
Weed Control (wheat)	Chevalier (20 g ai/ha) as early post-em (for wheat)	Chevalier (20 g ai/ha) as early post-em	Nil for barley
Weed control (legumes)	Challenge (600 g ai/ha) for broad leaves and Fusilade (0.25 kg ai/ha) for grasses as post-em 4-6 weeks after sowing	Challenge (600 g ai/ha) for broad leaves and Fusilade (0.25 kg ai/ha) for grasses as post-em 4-6 weeks after sowing	Nil for legume (if needed slight hand weeding)
Conventional disk at 10 cm; Moldboard plow at 20 cm; Minimum tillage is with ducks-foot			

cultivator at 12-15 cm depth			
Long-term Crop rotation trials	After the review	After the review	10 vetch and 5 barley varieties to be identified for the mixture combinations to be studied in a replicated trial at Tel Afer station (Because of its complexity Dr Ali Moneim suggests that we plan for it in detail this year and implement in 2006/07)
Sowing date and seed rate	After the review	After the review	After the review

Long-term Crop Rotation Trials:

- Findings and conclusions from previous rotation research need to be reviewed so that an informed plan for 2006/07 research can be developed. Drs Adary and Kasim agreed to undertake the review with assistance from young researchers in Mosul.
- Cropping pattern changes with time as the market needs changes, so research needs to anticipate for what farmers could do later.

Suggested measurements in tillage trial at Research Stations:

- Soil parameters (soil moisture at planting, flowering and harvest at 0-10cm, 20 cm interval until 120 cm; nutrients at the same depth, OM 0-10, 10-20 cm, Bulk density at 20 cm with 10 cm interval, porosity at 20 cm with 10 cm interval)
- Pests/diseases incidences
- Crop factors (Grain and straw yield and yield parameters at harvest; TDM at flowering; phenology; grain quality)
- Economics
- Environmental parameters (weather data)

Suggested measurements in demonstrations:

- Crop factors (date of sowing, emergence, flowering and maturity; grain and straw yield; grain quality)
- Pests/diseases incidences to be monitored
- Economics (in consultation with survey team)
- Environmental parameters (rainfall)

Consolidated crop management practices recommended for demonstrations:

IDCM package for Chickpea:

- Moldboard after harvest of wheat (20 cm) + cultivator (10-12 cm) after rain + planting by drill
- HPR (Ghab 3 or 4)
- Seed treatment (Vitavax)

- Planting at end December with 120 kg/ha seed
- Fertilizer: 50 kg DAP/ha at planting
- Weeding (or Chemical weed control by Challenge (600 g ai/ha) for broad leaves and Fusilade (0.25 kg ai/ha) for grasses as post-em 4-6 weeks after sowing)
- 1 foliar spray 4 weeks after emergence (Chlorathalonil)
- 2nd spray if wet front

Optimum Management for Lentil and Vetch:

- Chisel after harvest of wheat (20 cm) + cultivator (10-12 cm) after rain + planting by drill
- HPR (Idleb 2 in LRA; Idleb 3 in MRA)
- Seed treatment (Vitavax)
- Planting end November with 100 kg/ha seed rate
- Fertilizer: 50 kg DAP/ha at planting
- Weeding [or Chemical weed control by Challenge (600 g ai/ha) in lentil and Basagran (500 g ai/ha) in vetch for broad leaves and Fusilade (0.25 kg ai/ha) in both crops for grasses as post-em 4-6 weeks after sowing]

Optimum Management for Cereals:

- Mouldboard plow after harvest of wheat (20 cm) + cultivator (10-12 cm) after rain + planting by drill (in HRA)
- Chisel after harvest of wheat (20 cm) + cultivator (10-12 cm) after rain + planting by drill (in MRA and LRA)
- HPR (Bread wheat: Abu Graib3 or Cham 6 for HRA; Durum wheat: Waha or Om Rabia 5 for MRA; Barley: A. Aswad for LRA)
- Seed treatment (Vitavax)
- Planting after rain in December with 120 kg/ha seed rate (BW), with 140 kg/ha (DW), with 120 kg/ha (Barley)
- Fertilizer: 100 kg DAP-18-46% / ha at planting + 90 kg Urea/ha as top dressing (HRA); 60 kg DAP-18-46% / ha at planting + 30 kg Urea/ha as top dressing (MRA); 50 kg DAP-18-46% / ha at planting + 15 kg Urea/ha as top dressing (LRA)
- Weed control: Chevalier (20 g ai/ha) as early post-em (for wheat only in HRA and MRA), and no weed control for barley (if needed just apply 2,4-D at tiller stage)



Appendix 1

International Center for Agricultural Research in the Dry Areas
(ICARDA)

ICARDA

Iraq-ICARDA-ACIAR Project (CIM/2004/024) Better crop germplasm and management for improved production of wheat, barley and pulse and forage legumes in Iraq

2005/06 workplan meeting

4-8 September 2005

ICARDA Aleppo, Syria

Agenda

Friday/Saturday 3-4 September 2005

Arrival of participants - accommodation at the Amir Palace Hotel

Sunday 4 September 2005

0800-0830	Transport: Amir Palace Hotel to ICARDA Tel Hadya	
0830-0900	Registration	
0900-0930	Official opening	Mr Michel Valat Dr Saleh Bader
0930-1030	Group photo and coffee	
1030-1100	Meeting program and plans	Dr C Piggin
1100-1200	Agricultural and R&D situation in Ninevah	Dr Adnan Adary
1200-1300	Lunch	
1300-1400	Seminar: Grain legumes R&D in Australia	Dr K Siddique
1400-1500	Review of background information on crop improvement and management in Ninevah	Dr A Adary
1500-1530	Coffee	
1530-1700	Review of background information (cont)	
1700-1730	Transport: ICARDA-Amir Palace Hotel	

Monday 5 September 2005

0800-0830	Transport: Amir Palace Hotel - ICARDA	
0830-1000	Preliminary results from baseline surveys	Dr Salem Al-Naimi
1000-1030	Coffee	
1030-1200	Baseline survey results (cont)	
1200-1300	Lunch	
1300-1400	Seminar: Cereal improvement in Australia	Dr R Lance
1400-1500	Discussion group – legume workplan	Drs A El-Moneim, B Bayaa, K Siddique

1500-1530 Coffee
 1530-1700 Legume workplan (cont)
 1700-1730 Transport: ICARDA-Amir Palace Hotel
 1900-2100 Official project dinner (Yasmeen House)

Tuesday 6 September 2005

0800-0830 Transport: Amir Palace Hotel - ICARDA
 0830-1000 Discussion group – cereal workplan Dr S Grando,
 O Abdullah, R. Lance
 1000-1030 Morning tea/coffee
 1030-1200 Cereal workplan (cont)
 1200-1300 Lunch
 1300-1400 Seminar: New farming system horizons in Australia Dr D. Coventry
 1400-1500 Discussion group – crop management workplan Drs M Pala,
 D Coventry
 1500-1530 Coffee
 1530-1700 Crop management workplan (cont)
 1700-1730 Transport: ICARDA-Amir Palace Hotel

Wednesday 7 September 2005

0800-0830 Transport: Amir Palace Hotel - ICARDA
 0830-0930
 0930-1000 Morning tea/coffee
 1000-1100 Seed requirements/production Dr Z Bishaw
 1100-1200 Discussion: training and Capital item requirements
 1200-1300 Lunch
 1300-1400 Seminar: Crop-livestock integration in Australia Dr K Siddique
 1400-1500 Visit to IPM laboratory Dr M Bohssini
 1500-1530 Coffee
 1530-1700 Discussion - project operations, management,
 finances and reporting, seed production,
 training, capital items

Thursday 8 September 2005

0800-0830 Transport: Amir Palace Hotel - ICARDA
 0830-1000 Presentation of workplans
 - cereals Dr O Abdullah
 - legumes Dr A Monheim
 - crop management Dr M Pala
 1000-1030 Morning tea/coffee
 1030-1150 Workplan reports (cont)
 1150-1200 Close
 1200-1300 Lunch

Friday/Saturday 9-10 September 2005

Departure to Baghdad, Mosul and Australia according to transport arrangements

Appendix 2 Participants

Name/Title	Institution	Address	Fax/Tel/Email
<u>Iraq</u>			
Dr. Awad Issa Abbas Director General	The State Board for Agricultural Extension and Cooperation, MOA	P.O. Box 28552, Abu Graib, Baghdad	Off: 009641-5112040 Res: 00964-1-5150431 Mob: 00964 7901881214 awadabbas2003@yahoo.com
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Dr. Imad Yousif Abdullah Lecturer/Assistant Prof	University of Mosul, College of Agriculture and Forestry	Mosul, Ninevah	Res: 00964-60-510916 imadismail@yahoo.com
<u>Australia</u>			
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Dr David Coventry	Chair, Sustainable Agricultural Production	Soil and Land Systems, School of Earth and Environment Sciences, The University of Adelaide, Roseworthy Campus, SA, 5371 Australia	Phone: 61 (0)8 83037954; Mob 0417 874534 Fax: 61 (0)8 83037730 david.coventry@adelaide.edu.au
Dr Reg Lance	Senior Plant Breeder - Barley	Department of Agriculture - Western Australia	Phone (08) 9368 3502 Fax (08) 9474 2840 rlance@agric.wa.gov.au

		Locked Bag No. 4 Bentley Delivery Centre 6983 Western Australia	
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Appendix 3 Possible training courses at ICARDA in 2005 and 2006

JICA / ICARDA –funded training courses for Iraq:

1. Water Management for Improved Water-use Efficiency in the Dry Areas (6 weeks)
2. Integrated Crop and Livestock Production (3-weeks)
3. DNA Molecular Marker Techniques for Crop Improvement (2 weeks)

JICA / ICARDA – funded training courses / workshops for Afghanistan:

4. Seed Enterprise Development and Management (November 13-24, 2005)
5. Legume Crops Improvement (2 weeks)
6. Seed Processing, Storage and Marketing (2-weeks)
7. Cropping systems and Integrated pest Management (2 weeks)
8. Seed Health Testing (2-weeks)
9. Agricultural Information Management, Experimental Design and Data Analysis (2 weeks)
10. Forage & Pasture Seed Production (2 weeks)
11. Workshop on Liberalization of National Seed Sector (one week)
12. Workshop on Participatory Plant Breeding and Implications for Seed Industry Development (one week)
13. Workshop on Small Scale Seed Enterprise Development (one week)
14. Workshop on Plant Variety Protection and Implementations for Seed Industry Development (one week)

Other Course:

15. Utilization of Expert Systems in Agricultural Research and Production (2 weeks)
16. Automated Library and Information Management
17. Experimental Designs, Data Analysis and Field Plot Techniques
18. Scientific writing and Data Presentation
19. Seed Bank Management
20. Natural Resources Management
21. Ago-ecological characterization
22. Geographic Information Systems and remote Sensing
23. Crop Improvement
24. Integrated Pest Management

Information supplied by:

Dr. Samir El-Sebae Ahmed, Head, Human Resources Development, ICARDA

Appendix 4. Seed Issues and Role of SU in Iraq-ICARDA-Australia (ACIAR) Project

The following are the seed issues with implications for the Seed Unit. The SU in coordination with MP4 and crop improvement programs of MP2 will take overall responsibility for arranging the dispatch of seed to Iraq. All seed for demonstration and research should be prepared and delivered to the SU as soon as possible so that it is ready to send to Iraq before mid-October 2005. It will be dispatched by truck to the Directorate of Agriculture, Ninevah Governorate, Mosul, Iraq (Dr Abdul Sattar Al-Rajbu, Director).

1. Project objectives

The project document specifies seed-related activities under Objective 2 Activity 2.1 and Objective 4 Activity 4.1, namely capacity building in seed production and quality control and purchase of equipment.

Objective	Activity	Time line	Milestone
2. Introduce, evaluate and select improved germplasm of wheat, barley and pulse and forage legumes	2.1 Develop capacity at Rabia station to produce seed for research and demonstrations	Yr 1	Equipment purchased and seed quality control in place
4. Enhance the capacity of Iraqi research and extension program	4.1 Short-term training courses in seed production & seed quality control	Yrs 1, 2 and 3	Iraqis complete training each year

2. Seed supply for R & D

It was agreed that ICARDA will provide large quantities of seed of cereals and legumes for demonstrations and research as specified in the workplans and Tables 2.1 and 2.2.

3. Capacity building

Selected Iraqi collaborators will participate in existing or specially designed seed courses. The purpose is to strengthen the capacity in research stations to produce quality seed for demonstrations and maintaining released varieties.

4. Rehabilitation of facilities

The Seed Unit is obtaining costing for a seed cleaning machine based as requested by MOA staff at the meeting. It is expected that the budget should be adequate for a machine with a capacity of 1 t/hr. The results of enquiries will be communicated in due course.

5. Long-term seed sector development

Despite an impressive list of recommended varieties in Iraq, the adoption and diffusion of recommended varieties is still limited (e.g. Waha (Cham 1)- 20.4%; Corfila (Cham 3?)- 22.1%, Garonya – 23.6%). The major seed source is from informal sector (government = 8.5% and farmer saved = 91.5%). It will be important to develop a medium to long-term strategy for seed sector development if the results of research and demonstration are to be extended and adopted widely by farmers.

Table 4.1 Amount (kg) of seed available for demonstrations with ICARDA Seed Unit (SU) and Crop Improvement Programs

Crop/Variety	Quantity available with SU					Quantity to be supplied and responsibility
	QS	CS	BS	PBS	BS	
Barley						
Tadmor	0	0	0	150	26	360 kg (BIP)
Rihane 03	800	0	350	2100	15	360 kg (SU)
Zambaka	0	0	0	1650	6	360 kg (SU)
Furat 1	0	0	0	0	0	400 kg (GOSM-BIP)
Bread wheat						
Cham 4			2050	215	55	840 kg (SU)
Cham 6			1050	50	53	360kg (Iraq)
Durum wheat						
Waha (Cham 1)	100	0	0	150	63	Available if requested
Cham 3	0	0	150	50	24	50 kg requested (SU)
Cham 5	0	25	0	600	76	420 kg (SU)
Omrabi 5	30	0	0	0	12	Available if requested
Faba bean						
Aquadulce	10	0	0	0	15	80 kg (FBIP)
ILB 1814	0	0	0	0	0	80 kg (FBIP)
Chickpea						
Ghab 4 (FLIP-93-93)	0	50	1400	0	12	2000 kg (SU/CIP)
Dijla (FLIP 3279)	0	0	0	0	0	50 kg (SU/CIP)
IP510 (FLIP86-05)	155	0	0	0	0	400 kg (SU/CIP)
Lentil						
Idlib 1 (Baraka)	0	0	0	150	14	100 kg (SU/LIP)
Idlib 2 (IPA 98)	1100	0	1000	0	9	500 kg (SU/LIP)
Idlib 3	950	0	1000	0	4	100 kg (SU/LIP)
Idlib 4	0	0	0	100	4	Available if requested
Vetch						
<i>V. dasycarpa</i> var. <i>Kouhak</i>	0	0	0	0	0	150 kg (SU/FIP)
<i>V. narbonensis</i> var. <i>Velox</i>	0	0	0	0	0	150 kg (SU/FIP)
<i>L. sativus</i> var. <i>Ali-bar</i>	0	0	0	0	0	50 kg (SU/FIP)
<i>L. sativus</i> # 587	0	0	0	0	0	50 kg (SU/FIP)
<i>V. sativa</i> # 713	0	0	0	0	0	150 kg (SU/FIP)
<i>V. sativa</i> #2220	0	0	0	0	0	50 kg (SU/FIP)

Table 4.2 Amount (kg) of seed available for research with ICARDA Seed Unit (SU) and Crop Improvement Program

Crop	Breeding lines/materials	Quantity available with SU (kg)	Quantity to be supplied to Iraq (kg)	Responsibility
Barley	MRA- 2+6 row& b+w (100 entries) LRA-2 row & black (100 entries)		4 sets 2 sets	BIP
Bread wheat	HR/IR-SBWSN (140 entries) MR/LRSBSN (86 entries)		2 sets 5 sets	BWIP
Durum wheat	HR/IRDWSN (140 entries) MRDWSN (100 entries)		2 sets 1 set	DWIP
Faba bean	Fiesta, Ascot, Cairo, Farah ILB1814 selections (L-2, L-12, L-62, L-63, L-86) 3 international nurseries (CS, AB & improved populations) C.S/Sel 97 latha97 92-1, Sel F6/1431/2003, Sel F6/1432/2003, Sel F6/1433/2003, Sel F6/1434/2003-2, Sel F6/1435/2003, Sel F6/1438/2003-1, Sel F6/1441/003-2, F6/1443/003, F6/1444/003, F6/1445/003, Sel 97 lat 970 95-1, Sel 97 lat 97 905-2, Sel 97 lat 970 95-3		200 seeds each 5 kg per line 2 sets of each 200 seeds each	FBIP FBIP FBIP FBIP
Chickpea	FLIP 97-530 CLIMA(Almaz) FLIP 97-503 CLIMA(Nafice) On-farm lines (SY)-AB lines FLIP 97-588 FLIP 97-677 FLIP 97-706 FLIP 97-657 Combined (AB& FW) (Gabi to provide the list and arrange seed increase at ICARDA 2005) Chickpea international stress nurseries (FW, AB, Cold, Drought) and adaptation trials (CIEN winter and spring)	255 kg 220 kg 310 kg 250 kg	Seed increase at ICARDA (2005) 20 kg each line Based on Terbol Harvest 2 sets of each of 6 nurseries	CIP SU/CIP CIP CIP
Lentil	Baraka (Idlib 1) Idlib 3 IPA 98 (Idlib 2) ILL 590, 6829, 7012*, 7978, 7979, 8090, 9902, 9938, 9939, 9962, 9980, 9998	150 kg 1000 kg 1000 kg *1500/30 kg	5 kg 5 kg 5 kg 5 kg each line	LIP LIP LIP LIP
Forage legumes	International nurseries IFLVS, IFLVE, IFLLS		3 sets of each	FIP