2007/08 Planning Meeting Minutes and Workplan

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

Project reporting and planning meeting
2-6 September 2007
ICARDA, Aleppo, Syria

Contents

1. Items arising from the meeting for action

1. Complete baseline survey report/publication	Drs Shideed, Mohamed , Al-Rawi, Abdullah
2. Complete meeting minutes and 07/08 workplan	Dr Piggin, Pala and ICARDA scientists
3. Complete 06/07 technical report	Dr Pala, Piggin and all scientists
4. Obtain MOA approval to purchase seed cleaners	Drs Bader, Al-Rajbu
5. M/DOA to approve 3 trainees for Australia	Drs Bader, Al-Rajbu and MOA
6. M/DOA to nominate training courses/participants	Drs Bader, Al-Rajbu and MOA
7. Prepare/dispatch R & D seed to Mosul	Dr Niane + ICARDA breeders
8. Advice on success of recent transfer of funds	Drs Bader, Al-Rajbu and MOA
9. Prepare sites and seed for planting	Dr Al-Rajbu and DOA/MOA Ninevah
10. Plant and measure demos/trials as planned	Dr Al-Rajbu/Dr Adary and DOA/MOA
11. Prepare and undertake ACIAR external review	ICARDA/MOA/DOA/Uni Mosul/ACIAR
12. Prepare and submit Phase 2 extension proposal	ICARDA/MOA/DOA/Uni Mosul/ACIAR

2. Meeting Report

2.1 Purpose

The meeting was an agreed activity in the project document and aimed to report on the 2006/07 research and demonstration achievements and develop the workplan for the 2007/08 research and demonstration program. The detailed objectives of the meeting were as follows:

- For research and demonstrations on legumes, cereals, agronomy and the baseline survey:
  - review/evaluate/report 2006/07 activities and results
  - develop 2007/08 workplans

- Review 2006/07 progress and 2007/08 plans for:
    - training
    - capital items
    - finance
    - seed requirements
    - external project review
    - project continuation/extension/Phase 2
- Facilitate exchange of information and experiences through seminars by Australian collaborators on relevant crop-livestock systems in Iraq/Australia

Planned outputs from the meeting were:

- presentations on 2006/07 technical results according to the agreed workplan
- presentations on agreed 2007/08 workplan compatible with:
    - objectives, outputs (Table 3.2), activities (3.3a Flow chart) and budget
- draft reports
    - 2006/07 technical report
    - 2007/08 workplan
- agreed strategy to implement the workplan

2.2 Agenda

The meeting was held over five days at ICARDA. The agenda is in Appendix 1. There were 8 participants from MOA (5 from Baghdad, 3 from Mosul), 19 from DOA Ninevah, 2 from University of Mosul, 3 from Australia and some 20 from ICARDA (see Appendix 2).

Participants were officially welcomed to the meeting by Dr Ahmed El Ahmed, acting-DG, Dr Ahmed Sidahmed, Acting Director of DSIM Program, and Dr Saleh Bader, DG State Board of Research MOA. Dr Piggin gave an overview of background and achievements of the project to date.

Because of the difficulties for collaborators to get together, the first day was spent in working groups preparing and reviewing 2006/07 results and presentations for legumes, cereals, socio-economics, and agronomy. These were presented on the second day and third morning. 2007/08 workplans were prepared/discussed on the third afternoon and fourth day and presented on the fifth morning. The fifth day also was used to review/plan/discuss training (ICARDA and Australia), capital items, finance, seed, the project review and Phase 2, and other issues

Technical reports on results from the demonstrations and research are being prepared. The agreed workplan is detailed below under cereals, legumes and crop management.

2.3 Seminar series

A highlight of the meeting was a series of lunch-time seminars by the Australian participants on various aspects of advanced crop research and development in Australia, to expose, illustrate and discuss diversity in approaches to crop yield improvement, especially to Iraqi scientists who have had opportunities to interact internationally quite curtailed over the last decade. The seminars, each attended by some 50 ICARDA and ACIAR-project scientists, were as follows:

- "Wheat Breeding for Salt Tolerance". Keith Alcock, Director Crop Research, Dept. of Agriculture and Food Western Australia (DAFWA)
- "Recent advances in wheat improvement in the Department of Agriculture Breeding Program". Dr. Robin Wilson, Principal Wheat Breeder, DAFWA
- "Some thoughts on starting new cropping industries based on experience with field pea in Western Australia". Mark Seymour, Senior legume agronomist, DAFWA, and representing the University of Western Australia/CLIMA

2.4 Training

ICARDA-based training

There are 23 places available for short-term training at ICARDA each year. There were in fact 34 trainees attending 7 courses in 2006/07 as follows:

- Automated library and information operations 12-23 Nov 06 (1 trainee)
- Utilization of Expert Systems in Agric Res and Prodn 5-16 Nov 06 (4 trainees)
- Seed Health Testing 19-29 Mar 07 (6 trainees)
- Weed Management 19-29 Mar 07 (3 trainees)
- Variety Management and Seed Quality Assurance 6-17 May 07 (3 trainees)
- Integrated Crop and Livestock Production 8-26 April 07 (10 trainees)
- Water Management for Improved Water Use Efficiency 7 May-7 June 07 (4 trainees)

Thirteen (13) trainees have been nominated to take part in 2007 ICARDA courses (see Appendix 3) on “Cereal Crop Improvement” and “Integrated land Management in Drylands.” There are 10 places available for further courses in 2008. There was discussion at the meeting that some further training should be directed at research station operations, video production and experimental program mechanization. A list of 2008 ICARDA courses once finalized will be sent to MOA/DOA requesting advice on preferred courses and nominated trainees.

Study/training visits to Australia

Difficulties continued in the nomination of three (3) trainees to undertake short-term study tours to Australian partner institutions (University of Adelaide, Department of Agriculture Western Australia, CLIMA/University of Western Australia), it was agreed with ACIAR to postpone the Australian training until the start of the cropping season in May-June 2008. The need for timely (before the end of 2006) agreement on nominations of suitable candidates from MOA/DOA with good English, an MSc/PhD, and expected continuing involvement on crop research was discussed, to allow visa, travel and training preparations to be made. This needs follow-up or the opportunity for this training will be lost.

2.5 Capital items:

In response to MOA/DOA recommendations, the bulk of the capital budget has been allocated to the purchase of ten (10) seed cleaning machines to promote distribution and uptake of improved seed to farmers. The agreed machines from Darbas Engineering in Qamishli in Syria are worth about US$20,000 each (US$15,000 for the unit and diesel generator plus $5000 for an added gravity table) and it is possible to purchase 10 from the available budget of A$347, 669 (about US$257,275 at an exchange rate of A$1 = US$0.74), with US$50,000+ left for transport, training and other items. MOA/DOA officials/engineers inspected and discussed the Syrian-made Darbas

seed cleaning machine with ICARDA and the manufacturer from Qamishli in NE Syria several times during the year. One machine was delivered to Mosul on 13 August 2007 and, once customs clearance is received by the Directorate, it will be tested. DOA/MOA will advise ICARDA immediately it is agreed to proceed with supply of the other nine (9) machines. These will take some time to manufacture.

2.6 Finance

Allocations and expenditure (A$) in the first two years (May 05-May 07) were as follows:

ICARDA/ACIAR						
Better crop germplasm and management for improved of wheat, barley and pulse and forage legumes in I						
CIM/2004/024						
Statement of Expenditures						
End May 2007						
Figures in AUD						
Item	**Total budget**	**Actual Expenditures**				
		1st report May - Oct 05	**2nd report Nov 05 - April 06**	**3rd report May - Oct 06**	**4th report Nov 06 - May 07**	**Cu 1 M**
Personnel			1,950.00	10,765.00	14,183.91	
Supplies & Services	154,740.00	2,474.00	4,696.00	2,076.00	11,700.83	
Travel	150,060.00	26,514.00	11,247.00	54,096.00	44,744.12	
Infrastructure Costs	45,720.00	4,348.00	3,523.00	10,987.00	11,914.69	
Iraq - Supplies and Services	199,500.00		6,500.00	60,000.00		
Iraq - Capital	356,666.00		8,991.00	2,716.00	8,797.71	
UNIV Adelaide	98,000.00	19,000.00	27,000.00		26,000.00	
Dept of Agric West Aust	98,000.00	13,500.00		13,000.00	45,500.00	
Univ West Aust	98,000.00	13,000.00	13,000.00		26,000.00	
Grand Total	**1,200,686.00**	**78,836.00**	**76,907.00**	**153,640.00**	**188,841.26**	
Funds Status	**AUD**	**USD**	**Rate**			
Fund received in July 2005	455,863	351,437	1.30			
Funds received in June 2006	182,137	132,509	1.3745			
Funds received in Nov 2006	107,203	83,713	1.2806			
Funds received in Dec 2006	174,137	135,233	1.2877			
Total receipts	919,340	702,892				
Less cummulative expenditures	498,224					
Balance available end May 07	**421,115.74**					

Difficulties with provision of project funds to Iraq have continued with no transfer possible after the first year allocation of A$60,000 (US$43,754.10) was transferred to the MOA Baghdad Bank via the ICARDA Office in Jordan on 28 June 2006 and received on 6 September 2006. Discussions have continued with Drs Bader/Al Rajbu to follow-up and advise a new

DOA/MOA-agreed system to allow the 2nd payment (A$66,000) and following allocations to support project work.

2.7 External project review and Phase 2

ACIAR and AusAID are amenable to a continuation of the project after June 2008 but this will depend on current achievements and outcomes. ACIAR has indicated it will undertake an external review to evaluate the project and consider future support, possibly in Mar-Apr 08. This would involve 2 reviewers visiting ICARDA for a week, to hear of project progress, achievements, problems and future possibilities from Iraqi, ICARDA and Australian collaborators.

This is a serious technical review which will decide any future support. It will require preparation of a brief progress/achievements report, provision of all significant project reports and documents, and good presentations on demonstrations, research, training and capital equipment provision. The presence and contribution of involved scientists from ICARDA (e.g., Abdallah, Grando, Nachit, Sarker, Malhotra, Bohssini, Kumari, Abang, agronomist), Iraq (e.g., Bader, Rajbu, 2 demo site managers, 2 involved researchers) and Australia (e.g., Coventry, Siddique, Alcock or AgWA rep) would be essential for the success of the review.

If an extension/Phase 2 is recommended and agreed, it would need preparation of a detailed proposal, which would have to proceed through the ACIAR project development cycle (see www.aciar.gov.au), which may take 3-6 months. This would require a project development meeting at ICARDA with Iraqi MOA/DOA, University of Mosul, Australian and ICARDA officials/scientists and development of an agreed proposal. Dr Liz Bailey would need to be involved. It is possible that the project could have a Phase 1 extension beyond June 2008 to continue activity whilst a Phase 2 proposal is being developed and approved.

Objectives for an extension/Phase 2 project were considered and it was suggested it would be technically sound and attractive to build the project around conservation cropping, because of the initial success and interest in zero-tillage and the global importance of sustainability and conservation. Variety testing would continue. Components should be a mix of demonstration/extension, research, training, and capital refurbishment. Possibilities for emphasis discussed included such things as:

- expansion of the project into a second Governorate
- agronomic refinement, verification and promotion of conservation cropping (zero-till, stubble mulching, diverse rotations)
- developing local capacity for design, supply and spread of ZT machinery
- socio-economic analysis of adoption and impact of new technologies
- new approaches to variety improvement, multi-site testing, and data analysis/interpretation (refer to seminars of Drs R. Wilson, AgWA and J. Berger, CSIRO/CLIMA)
- reconsideration of linked modules on research station and genebank refurbishment and seed industry development
- short-term training at ICARDA
- MSc/PhD training of selected Iraqi scientists at ICARDA linked to Australian Universities

3. Summary of project achievements 2005-06
In summary, the achievements for 2005/06 were reported as follows:

3.1 Annual reporting and planning meeting

- results from 2005/06 demonstrations and research trials were:
  - presented and discussed
  - circulated in the "First Technical Report April 2005 - October 2006. ICARDA/DOA-MOA Iraq/University of Adelaide/University of WA-CLIMA, Agriculture WA. 100pp"
- workplans for 2006/07 were:
  - discussed and presented:
    - 35 variety X agronomy demonstrations (24 cereals, 9 food legumes, 2 forages)
    - 37 research yield trials (24 cereals, 7 food legumes, 3 forages, 3 agronomy)
  - circulated in the "Report of the Project Planning Meeting, 1-5 Oct 2006, ICARDA, Aleppo, Syria, 28pp"
- 2 tonnes of ICARDA seed to support the R & D program was sent to Mosul arriving 16 Dec 06. Other necessary seed was saved from the 2005/06 harvest in Ninevah

3.2 Demonstration program

- the agreed program was well implemented across 12 locations with crops compared under farmer, improved tillage, and zero-tillage establishment
- farmer field days/inspections were held at all sites
- there was strong interest in zero-tillage

3.3 Research program - Ninevah

- only part of the planned program of 37 research trials (24 cereals, 7 food legumes, 3 forages, 3 agronomy) could be implemented
- there were reportedly 14 trials undertaken included yield/nursery trials for bread wheat (2), durum wheat (2), barley (3), chickpea (2), lentil (1), faba bean (2), vetch (1) and an agronomy management/rotation trial. Results from some of these were not presented.
- seed increase was undertaken for bread wheat, durum wheat, barley and lentil
- Dr Suaad from Mosul University gave a presentation on research conducted on infestation levels and effect of weed control (Gramoxone, Chevalier, Granstar, Locsan) and insecticides (Diazanon, alpha cypermethrin 50%) on the wheat leaf miner *Syringopais temperatella* Led. On wheat and barley crops in demonstrations in AlHamdania and Tellkief. The insecticide Disez (ULV) was used at 250 ml/dounm on18/5/2007 to control Sunn pest in all wheat plots
- Dr Sa'ad H. Mohamed, Research Head Assistant, MOA Baghdad, gave presentation summarizing results from socio-economic activity and the baseline survey. This included data on yields and net revenue from wheat, barley, pulses and forages from all demonstration locations, illustrating relatively good performance under both chisel and zero-tillage establishment

3.4 Research program - ICARDA

- four trials were conducted comparing zero-tillage and conventional cultivation with wheat, barley, oats, chickpea and lentil. Yields were similar or higher with zero-tillage. The trials were inspected and discussed with several visiting Iraqi scientist and farmer groups
- on-farm demonstration with zero-tillage and stubble mulching were undertaken in Barkoum Village near ICARDA. The Indian zero-till seeder worked well, even on stony soils. A large field day was held and local cooperating farmers were very interested in ZT
- testing of varieties/lines of oats, peas, canola and other oilseeds from Australia with potential for adaptation and use in Iraq continued. Unfortunately, establishment was poor and trials could be harvested
- seed multiplication of promising varieties/lines of oats from Australian collaborators was successful. Mitika and Possum gave the highest yields, producing nearly 1 t/ha

3.5 Capacity building program

- Training
  - The agreed training program for 23 scientists was exceeded with 34 participants in the following courses:

1.	Automated library and information operations	12-23 Nov 2006 (1 trainee)
2.	Utilization of Expert Systems in Ag Res and Prodn	5-16 Nov 2006 (4 trainees)
3.	Seed Health Testing	19-29 Mar 2007 (6 trainees)
4.	Weed Management	19-29 Mar 2007 (3 trainees)
5.	Variety Management and Seed Quality Assurance:	6-17 May 2007 (3 trainees)
6.	Integrated Crop and Livestock Production	8-26 April 2007 (10 trainees)
7.	Water Management for Improved WUE	7 May-7 June 2007 (4 trainees)

- Conferences
  - Dr Suaad R Abdullah, entomologist, Mosul University, supported to attend the 9th Arab Congress of Plant Protection in Damascus, Syria, 19-23 November 2006 (fostering IPM collaboration)
- Farmer visits
  - 8 farmers and 5 DOA staff from Ninevah visited ICARDA and inspected research on crop improvement and soil and crop management including zero-tillage

3.6 Capital purchases

- seed cleaning plants
  - considerable interaction on the purchase of 10 MOA-requested plants including several inspections by DOA/MOA at the manufacturer's factory in Syria. A prototype for testing delivered to Mosul in Aug 2007. Should be available for cleaning of the 2007 harvest
- sub-soilers (deep tillage machines)
  - 2 from Turkey delivered to Ninevah on 29 March 2007

3.7 Major problems 2006/07

- implementation difficult given the political and security situation in Iraq.
  - research activities concentrated at Rashidiya Research Station because of land disputes and security concerns at other stations. Violence in Mosul and project locations made office and field activity difficult and dangerous
- Ninevah Implementation Committee unable to meet in Mosul/Ninevah

  - dangerous to travel/assemble regularly, so coordination and oversight have been through regular visits and interactions at R & D sites
- in-country field visits by ICARDA and Australian collaborators not possible
  - no joint inspections/discussions of trials/demonstrations in the field
- short-term Australian training for three MOA/DOA cropping research/extension scientists in April 07 could not proceed
  - difficulties identifying appropriate staff. New nominees for April 08 were discussed at the meeting with the aim of undertaking the training in 2008
- not possible to transfer 2007 project funds to MOA Iraq
  - documentation/approval difficulties with Capital Bank, Amman. MOA (Dr Salah Bader) and ICARDA. A transfer was finally achieved on 3rd Sept 07
  - nevertheless, the project is running well with MOA money until the transfer can be made

3.8 Publications/reports 2006/07

- Annual Project Report to ACIAR 2005-06. CIM/2004/024 Better crop germplasm and management for improved production of wheat, barley and pulse and forage legumes in Iraq, 1 May 2005-30 June 2006 . ICARDA
- Kasim Khalil Kasim (2006). Review of background information on crop rotation under the rainfall conditions in North of Iraq, MOA/DOA Ninevah, Iraq. June 2006. 5pp.
- Report of the Project Planning Meeting, 1-5 Oct 2006, ICARDA, Aleppo, Syria, 28pp.
- Kamel Shideed, Salem Younis Sultan, Sa'ad H. Mohamed, Watheq Abdul Kahar Al-Rawi, and Emad Yousif Ismael Abdullah (2006). Summary Report of the Baseline Socio-economic Survey Conducted in Ninevah Governorate, July-August 2005. ICARDA/MOA-DOA Iraq. 7pp.
- First Technical Report April 2005 - October 2006 (including Appendix 3 Details of crop management for all crops in alphabetical order of sites). ICARDA/DOA-MOA Iraq/University of Adelaide/University of WA-CLIMA, Agriculture WA. 100pp.
- Pala, M., A. Haddad, and C. Piggin. 2007. Challenges and Opportunities for Conservation Cropping: ICARDA experience in dry areas. Presentation in International Workshop on 'Conservation Agriculture for Sustainable Land Management to Improve the Livelihood of People in Dry Areas' by ACSAD, GTZ and FAO, 7-9 May, 2007, Damascus, Syria. 16pp.

In overview, it was agreed that the technical activities of demonstrations, research and training have proceeded well due to:

- the enthusiasm, industry, flexibility and dedication of Iraqi collaborators
- the strong interest and support of ICARDA and Australian collaborators
- the proximity of ICARDA

3) Workplans for 2007/08

Using the experience of 2006/07, workplans were developed to continue the very successful demonstration program. Discussions were held on difficulties in implementing the research program and agreements made with MOA/Mosul University/DOA to expand the research group, especially with some young scientists, and facilitate the research program. Workplans in accordance with planned personnel and support were developed for the research, socio-economic, and seed production activities in 2007/08. Workplans are detailed below.

For demonstrations and research trials on better crop varieties/lines and crop management technologies, the target locations remain as follows: High Rainfall areas (HRA): Al-Shekhan, Rabiah, Al-Koush; Medium Rainfall Areas (MRA): Al-Hamadaniah, Tel-Kef, Basheeka; Low Rainfall Areas (LRA): Tel-Abta, Al-Hadar, Al-Mahlabiah); Supplementary Irrigation (SI) Rabiah, Al-Namroud, Hmeidat. The locations are detailed in Figure 1.

All demonstration locations are in farmer fields with farmer participation in crop management and technology evaluation. Research trials will be undertaken mainly at Rashidia Research Station in Mosul (MRA) with some at other stations/locations [suggested in the workplan] depending on the security situation and available resources. Research trials will be managed by researchers in consultation with extension officers and farmers with farmer participation in technology evaluation.

3.1) Cereals

Testing locations:

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

3.1.1) Demonstrations

3.1.1a) barley

MRA	**LRA**
1 ha demonstrations in 3 sites	
Rihane-03	Zanbaka
Gezira 1	Local black
• one extra subsoiler treatment in one location under MRA and LRA • 200kg extra seed Zanbaka required	
10X10 m in 1 site (observation and seed production)	
Alanda-01	Zanbaka/SLB22-74
FAT05IN-133*	Yazan
* 4kg seed required	

3.1.1b) durum wheat

HRA	**MRA**	**SI**
1 ha demonstrations in 3 sites		
Cham 3	Omrabia 5	Omrabia 5
Garonia (local)	Garonia (local)	Cham 3
• one extra subsoiler treatment in one location under HRA, MRA and SI • 300kg extra seed required of Cham 3		

10x10m in 1 site (observation and seed production)		
Icasyr2	Fadda98	Lahnhaucan
2kg extra seed required	3kg extra seed required	4kg extra seed required

3.1.1c) bread wheat

HRA	**MRA**	**SI**
1 ha demonstrations in 3 sites		
AboGhraib 3	AbuGhraib 3	Adnanya
Cham 6	Cham 6	Tel Afar 3
• one extra subsoiler treatment in one location under HRA, MRA and SI		
10x10m in 1 site (observation and seed production)		
DAJAJ-5	BABAGA-3	QIMMA-6
ANGI-4	ABOUZIG	IZAZ-11
* 2 kg QIMMA and 4kg IZAZ seed required		

**** Best lines identified will be carried over for further testing next season and seed multiplication**

3.1.2) Research – Promising lines

Nursery and yield trial evaluations will be conducted as follows:

3.1.2a) barley

MRA	**LRA**
Nurseries	
MRA barley nursery (100 entries, 2 row black/6 row white)	LRA barley nursery (100 entries, 2 row, black seeded)
Yield trials	
MRA barley YT specific for Iraq needs (including black seeds) (to be compiled by Drs Cecarelli/Grando/Adary)	LRA barley YT specific for Iraq needs (including black seeds) (to be compiled by Drs Cecarelli/Grando/Adary)
Possible locations	
Research Stations: Al-Rashidya	Farmer Fields: Tel Abta

3.1.2b) durum wheat

HRA	**MRA**	**SI**
Nurseries		
	31st Durum Observation Nursery (240 Entries	31st Durum Observation Nursery (240 Entries

	including Checks)	including Checks)
Yield trials		
	31st Dryland Durum yield Trial- Continental Areas; 24 Entries including checks	31st Dryland Durum yield Trial- Continental Areas; 24 Entries including checks
Durum 05/06 candidates demos		
	Fadda98 Ammar9 Waha OmRabi5 Miki2 Gidara2 Lahnhaucan Beltagy2 **2kg seed of all required**	
Possible locations		
	Research station: Rashidya	Farmer field: Al-Namroud
Seed production		
Cham 3 – 100kg seed required		

3.1.2c) bread wheat

HRA	**MRA**	**SI**
Nurseries		
	CWANA 8th Spring Bread Wheat Observation Nursery (8th SBW-ON) (180 Entries including checks)	CWANA 8th Spring Bread Wheat Observation Nursery (8th SBW-ON) (180 Entries including Checks)
Yield trials		
	CWANA-Temperate Areas 8th Dryland Spring Bread Wheat Yield Trial (CWANA-TA 8th DSBWYT) 24 Entries including checks	CWANA-Temperate Areas 8th Dryland Spring Bread Wheat Yield Trial (CWANA-TA 8th DSBWYT) 24 Entries including checks
	CWANA-Continental /Irrigated Areas 8th Irrigated Spring Bread Wheat Yield Trial (CWANA-CA 8th IRSBWYT) 24 Entries including checks	CWANA-Continental /Irrigated Areas 8th Irrigated Spring Bread Wheat Yield Trial (CWANA-CA 8th IRSBWYT) 24 Entries including checks

Possible locations		
	Research station: Rashidya	Farmer field: Al-Namroud

3.2) Food legumes

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

3.2a) Chickpea

	HRA **(No SI required)**	**MRA** **(with SI as required)**	**LRA**	**Comments**
Demos	Dijla (FLIP 3279) 510 IPA (FLIP 86-05 Ghab 4 (FLIP 93-93) Local cultivar Location: Al Shekhan	Dijla (FLIP 3279) IPA 510 (FLIP 86-05) Ghab 4 (FLIP 93-93) New line (from Dr Malhotra-2 locations) Local cultivar Locations: Al-Kosh, Hamdania, Mahlabiah	.	1.Winter planting: All lines + local (ICM + IPM) 2. Spring planting: All lines + local (ICM + IPM) 3. Spring planting local (with farmer's practice)
Research	FLIP 97-530 (Almaz) FLIP 97-503 (Nafice) FLIP 97-588 FLIP 97-677 FLIP 97-706 FLIP 97-657 3 yield trials with last years selections International nurseries CIEN-LA-2007 Location: Mosul Research Station	FLIP 97-530 Almaz) FLIP 97-503 (Nafice) FLIP 97-588 FLIP 97-677 FLIP 97-706 FLIP 97-657		Seed increase of elite lines for future experimentation, release and dissemination

3.2b) Lentil

	HRA	**MRA**	**LRA**	**Comments**
Demos	-	Baraka (Idlib 1) IPA 98 (Idlib 2)		Three improved lines/varieties and local cultivar planted in

		Idlib 3 Local Locations: Hamdanyia, Telkeif		winter at all locations. ICM and IPM will be used to demonstrate the whole package
Research	-	ILL 590, 6829, 7012*. 7978, 7979, 8090, 9902, 9938, 9939, 9962, 9980, 9998 2 yield trials with last years selections Location: Mosul Research Station		Seed increase of elite lines for future experimentation, release and dissemination

3.2c) Faba bean

	HRA	**MRA**	**LRA**	**Comments**
Demos	Aquadulce ILB 1814 Local cultivar			Each demonstration on 0.5 ha in three locations. ICM and IPM will be used

Research	ILB1814-L-2 ILB1814-L-12 ILB 1814-L-62 ILB 1814-L-63 ILB 1814-L-86 Fiesta, Ascot, Cairo, Farah 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 Location: Mosul Research Station			Seed increase of elite lines for future experimentation, release and dissemination 15 lines with high auto-fertility

3.3) Forage Legumes

	Species	**HRA**	**MRA** Seed + Hay	**LRA** Feed	**Comments**
Demos	*V. sativa*		IPA 2001	IPA 2001	
	V. dasycarpa		Kouhak		
	L. sativus		Ali-bar,#587		
Research	International nurseries		IFLVS Locations: Hamdania, TelKeif, Bashika		Last year's trials

General notes on cereal and legume adaptation demonstrations and research trials:

1. demonstrations will include comparisons of introduced and local varieties under three (3) crop establishment and management technologies: farmer practice, modified tillage, and zero-tillage (see under agronomy below)
2. optimum 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)
3. seed rates: 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)
4. 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
5. in order to demonstrate the beneficial effect of legumes for following cereal crops each demonstration sites should include appropriate cereal and fallow phases of the rotation. This will help to establish appropriate crop rotations and assess the value of legumes in the following season.

3.4) Agronomy/crop management

3.4.1 Demonstrations - tillage/sowing

The testing and demonstration of tillage/sowing options will continue as part of the crop/variety demonstrations in 3 locations in each agro-climatic zone, comparing farmer practice, modified tillage, and zero-tillage for each of the test crop varieties.

With the cereals (barley, wheat, durum wheat), here will be an addition of one extra subsoiler treatment in one location under HRA, MRA, LRA and/or SI as specified under the cereal demonstration workplans above. This would involve initial deep tillage and application of gypsum according to the methodology for the deep tillage treatment outlined below under **3.4.2b Deep tillage**.

Demonstrations with the different crops may be with different farmers to make implementation easier.

Plot size: 0.5ha

Issues addressed	**HRA (no fallow used)**	**MRA (25% fallow used)**	**LRA (50% fallow used)**
Tillage/ sowing **1. Farmer practice** - Late sowing - Non-uniformity of seeds	1. One way disc after harvest of previous crop + broadcast seed and fertilizer + cover	1. One way disc after harvest of lentil + broadcast seed and fertilizer + cover with	1. One way disc after vetch grazing in early May or after barley harvest + broadcast

- Late emergence - Soil degradation **2. Modified tillage** - Better soil structure - Uniform seed distribution - Lower seed rate **3. Zero-tillage** - Better soil structure - Uniform seed distribution - Early emergence - Lower seed rate	with one way disk after rain (~Dec 15) (160 kg seed/ha) 2. Chisel (20 cm)) after harvest of chickpea + Ducks-foot after rain (12 cm) + drill after rain (~ Dec 15) (120 kg seed/ha) 3. Use Roundup or Gramoxone (1 l/ha) after initial rain for weed control if necessary + direct sowing by zero-till drill (~ Early Dec) (120 kg seed/ha).	one way disk after rain (disk drill)(~Dec 15) (160 kg seed/ha) 2. Chisel (20 cm) after harvest of lentil + Ducks-foot after rain (12 cm) + drill after rain (~ Dec 15) (120 kg seed/ha) 3. Use Roundup or Gramoxone (1 l/ha) after initial rain for weed control if necessary + direct sowing by zero-till drill (~ Early Dec) (120 kg seed/ha)	seed + cover with one way disk before rain (disk drill)(~Nov 15) (120 kg seed/ha) 2. Chisel (20 cm) after harvest of vetch + Ducks-foot plow before rain (12 cm) + drill before rain (~ Nov 15) (120 kg seed/ha) 3. Use Roundup or Gramoxone (1 l/ha) after initial rain for weed control if necessary + direct sowing by zero-till drill (~ Early Nov) (120 kg seed/ha)
SI location: The treatments in MRA will be repeated in SI sites			

Recommended management for tillage/sowing demonstrations			
Varieties	The same varieties used for cereal and legume demonstrations	The same varieties used for cereal and legume demonstrations	The same varieties used for cereal and legume demonstrations

Suggested observations/measurements in demonstrations include:

- crop factors (date of sowing, emergence, flowering, maturity; grain and straw yield; grain quality)
- pest/disease incidences monitored
- economics (in consultation with socio-economic team)
- environmental parameters (weather data)
- soil characteristics (chemical and physical) – possibly as part of a MSc study with Mosul University

3.4.2 Research

3.4.2a Conservation tillage (tillage and stubble mulching)

This trial was commenced at Rashadieh in 2006/07 by Dr Adary. There were some modifications including plot sizes of 2x50m^2 with 2 replicates and establishment of the zero-till treatments by hand. This trial will be continued by Dr Adary if manageable.

Consideration will be given to establishing such a trail in another location through Mosul University, with the involvement of post-graduate students.

	HRA	MRA (Loc: Rashadieh)	LRA
Treatments Cereal/legume rotations by two phases - Large plots (10*20 m) - 3 replicates	Nil	1. Conventional mouldboard plow (+/- stubble) 2. Minimum tillage (+/- stubble) 3. Zero tillage (+/- stubble) (Total area: 2 ha)	Nil
Recommended management of conservation tillage trials			
Varieties Fertilizer (wheat) Fertilizer (legume) Weed control (wheat) Weed control (legumes)	Nil	Om Rabia wheat/Idleb 3 lentil 60 kg DAP-18-46%/ha at planting + 30 kg urea/ha as top dressing 50 kg DAP/ha planting Chevalier (20 g ai/ha) early post-emergence Challenge (600 g ai/ha) for broad leaves and Fusilade (0.25 kg ai/ha) for grasses post-emergence 4-6 weeks after sowing	Nil
Moldboard plow at 20-25 cm; minimum tillage with chisel cultivator at 10-12 cm depth; zero-till with Indian ZT seeder			

Suggested observations/measurements in conservation tillage trial:

- soil parameters (soil moisture at planting, flowering and harvest at 0-10cm and 20 cm intervals until 120 cm; nutrients at the same depths; OM 0-10, 10-20 cm; bulk density at 20 cm with 10 cm interval; porosity at 20 cm with 10 cm intervals)
- pest/disease incidence
- crop factors (grain and straw yield and yield parameters at harvest; TDM at flowering; phenology; grain quality)
- economics
- environmental parameters (weather data)

3.4.2b Deep tillage

Aim: To investigate the effectiveness of deep tillage with application of gypsum to overcome soil compaction in Ninevah, Northern Iraq.

This trial could not be established in 2006/07. Consideration will be given to establishing it at Mosul University (3km from Rashadieh) in 2007/08, using the new sub-soilers supplied by the project from Turkey in January 2007. It would be led by researchers from Mosul University and involve MSc/PhD students and collaboration with DOA and MOA.

Experimental Treatments:
Randomized complete block design (RCBD) with 4 replicates

1. nil (control): use normal farmer methods of cultivation
2. deep rip to 40cm only.
3. apply 5 t/ha of gypsum to the soil surface only (incorporate with light cultivation after rain)
4. apply 5t/ha of gypsum to the soil surface and then deep rip to 40cm.

NB: All deep tillage (ripping) treatments should:

a) rip after rain (15-30mm) when the soil moisture is at field capacity
b) break down large clods after ripping with light cultivation
c) apply the 5t/ha gypsum to the soil surface before ripping and before the first rains if possible.

The Indian zero tillage seeder will be used to sow the crop on all tillage treatments (1-4)

Methods:
Agronomy/crop management

A. *Each year*
   - apply complete nutrients to all plots according to soil test
   - sow as soon as practical after the first rains of the season and use the crop appropriate to the sowing time. e.g. wheat (MRA) and barley ((LRA) in November or December; lentil or chickpea in December or January.
   - seed rate should be appropriate for each crop (see recommendation below).
   - weed control by appropriate herbicides (see recommendation below).
   - use the normal rotation at the site. e.g. lentil-wheat-lentil-wheat (because of the need to procure the vibrated sub-soiler from outside Iraq the trial could start with lentil after wheat). Idleb 3 (lentil) and Om Rabia (durum wheat) will be used

B. *After harvest each year*
   - return all crop residues to the soil
   - keep animals off the plot area
   - continue the experiment for 4 years on the same plots BUT only apply the deep tillage and gypsum in the first year. Use zero tillage seeder to sow the plots after application of Roundup each year.

Measurements:

1. depth to compact layer before the experiment and in each plot at sowing each year (use pointed steel rod of about 1 m)

2. test the topsoil (0-10cm) for nutrients each year
3. count plants/m^2 on 3 x 1m rows in each plot, each year
4. measure grain yield mechanically if possible OR by hand from 3x $1m^2$ quadrats per plot.
5. measure yield components and straw yield on 3 x 1m rows per plot

3.4.2c Agronomy trials at ICARDA

In agronomy studies at ICARDA linked to the project, two trials comparing zero-tillage vs. conventional cultivation of wheat, barley, oats, chickpea, and lentil using the Indian zero-till planter and three trials on adaptation/seed increase of Australian-supplied oilseeds, peas and oats will be conducted. These continue zero-till and adaptation research undertaken in 2005/06. These are giving good information on new systems of conservation cropping (zero-tillage, stubble mulching, diverse rotations) and are valuable for inspections and training of visiting Iraqi scientists and farmers. Seed of better-adapted lines will be increased for further testing, including in Iraq.

General notes on optimum management for agronomy/crop management demonstrations and research trials unless otherwise specified by treatments:

Optimum management 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 [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); 2^{nd} 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 120 kg/ha seed rate (lentil and V. narbonensis) and 100 kg/ha (Vicia and Lathyrus spp) and 80 kg/ha (V. dasycarpa)
- fertilizer: 50 kg DAP/ha at planting
- weeding or chemical weed control [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 seed rates of 120 kg/ha (BW), 140 kg/ha (DW) or 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) early post-em for wheat in HRA and MRA); no weed control for barley other than 2,4-D at tillering stage if necessary

3.5) Integrated disease and pest management (IDPM)

It was proposed in 2007/08 to enhance the IDPM component linked into the demonstrations and research trials, under the leadership and coordination of entomologist Dr Suad Abdallah Ardini from the crop protection group at the University of Mosul, with a pathologist, virologist and weed scientist to be identified. Some budget needs to be supplied for this program. The agreed activities were as follows:

- Monitor pest situation in farmers' field and demonstration plots
- Individual IPM training for 5-6 Iraqi junior scientists at ICARDA (virologist, cereal pathologist, legume pathologist, weed scientist, entomologist)
- Send special nurseries (viruses, diseases, insect pests) to IPM coordinator for testing in Iraq by specialists.

3.6) Socio-economics

The socio-economic program is implemented by Dr. Saad H. Mohamed, Dr. Emad Y. Esmaeel, Mr. Watheq A. Abdullah, Mr. Bassam Y. Al-Saieg, Mr. Mahdi S. Kheder with direction from Dr Kamel Shideed. The program follows the list of activities in the Project Document under 3.3. a. Flow chart (Methodologies).

Activity	**2005/2006**	**2006/2007**	**2007/2008**
1.2 Baseline survey and analysis of production constraints/limitations in individual agro-climatic zones	Survey - Data collection, analysis, discussion Constraints identified	Baseline survey report published	

1.8 Monitor demonstrations and jointly evaluate options with farmer groups to identify preferences and/or potential constraints to adoption		Input-output data collected and cost-benefit analyses of demonstrations commenced Farmer preferences recorded and potential constraints identified	Input-output data collected and cost-benefit analyses of demonstrations completed Farmer preferences recorded and potential constraints identified
1.11 Assess potential adoption and impact of technologies based on information from baseline surveys and results from demonstrations		Adoption and impact assessment underway	Adoption and impact assessments completed (questionnaire development, data collection/analysis, interpretation/reporting)
3.1/3.5/3.7 Joint evaluation of options with farmer groups. Identify potential constraints to adoption	Baseline survey (1.2)	Input-output data collected and cost-benefit analyses of research trials commenced Farmer preferences recorded and potential constraints identified	Input-output data collected and cost-benefit analyses of research trials Farmer preferences recorded and potential constraints identified
4.3 Individual training for MOA staff in economic analysis, adoption and impact assessment	Questionnaire Visits to ICARDA for baseline data analysis	Impact assessment workshop, ICARDA 5-9 Nov 06 Visits to jointly discuss/evaluate constraints, adoption and impact	Joint development of adoption and impact assessment survey Impact assessment (analysis/reporting) Visits to ICARDA for analysis/reporting

These activities will be achieved according to the following timetable:

- final production of baseline report Sept/Nov 2007
- economic analysis of the results of three seasons (05/06, 06/07, 07/08)
- adoption and impact assessment
    - questionnaire drafting, pre-testing, finalization Mar 08
    - data collection (farm survey June-July 08
    - data entry and analysis Aug-Sept 08
- results presentation and reporting Nov 08
    - adoption indicators
    - constraints to adoption
    - impact indicators

- sources of inefficiency in crop production under different rainfall zones
- wheat productivity (environmental indicators)
- risk analysis
    - crop
        - wheat (bread , durum)
        - barley
        - chickpea
        - lentils
    - Rainfall Zone
        - S.I
        - HRA
        - MRA
        - LRA
    - varieties
    - tillage system
        - control
        - chisel
        - zero tillage
- risk reducing package (NR, variance)
- stochastic dominance analysis

3.7) Seed supply and production

The Seed Unit is coordinating components to supply seed and equipment and improve seed production capacity in Iraq. These are represented in the Project Document under 3.3. a. Flow chart (Methodologies) as follows:

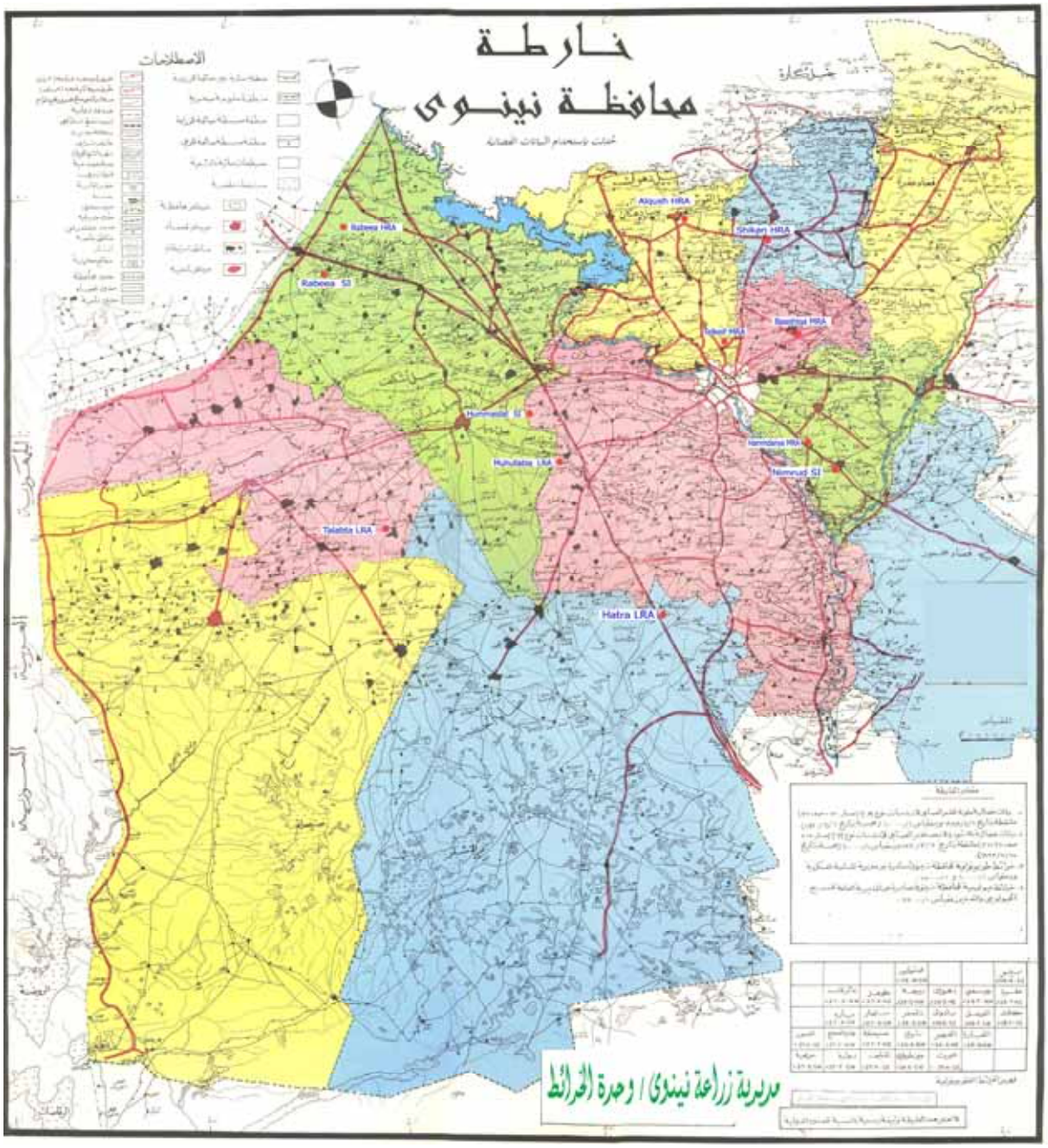
Activity	Time line	Milestone
2.9 Develop capacity at Rabia station to produce seed for research and demonstrations	Yr 1	Equipment purchased and seed quality control in place
4.2 Short-term training courses in seed production & seed quality control	Yrs 1, 2, 3	Iraqis complete training each year

Seed supply for R & D
It was agreed in 2005/06 that DOA Ninevah would save as much seed as possible from demonstrations and trials. This was done carefully with regular inspection to verify purity and most of the seed required for the 2007/08 program is available in Ninevah. ICARDA will supply limited seed (listed in Appendix 4) unavailable in Ninevah for demonstrations and research. The SU will coordinate assembly, testing and dispatch as soon as possible so that it is ready to send to Iraq in Oct/Nov 2007. It will be dispatched by truck to the Directorate of Agriculture, Ninevah Governorate, Mosul, Iraq (Dr Abdul Sattar Al-Rajbu, Director).

Developing capacity for seed production

The Seed Unit will continue to assist with the evaluation of the test seed cleaner delivered in August 2007 and the purchase/supply of the remaining 9 units, once MOA approval is provided to proceed. The SU will also assist with training in seed production and seed cleaner operation in conjunction with the machinery supplier Darbas Engineering in Qamishly, Syria. The purpose is to strengthen the capacity in research stations to produce quality seed for demonstrations and maintaining released varieties.

Figure 1 Locations of demonstrations and research trials in Ninevah, Iraq (2005-08)



Appendix 1 Meeting agenda

International Center for Agricultural Research in the Dry Areas (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

2007/08 reporting/planning meeting
2-6 September 2007
ICARDA Aleppo, Syria

Agenda

Friday/Saturday 31 Aug-1 Sep

Arrival of participants - accommodation at the Planet Hotel

Sunday, 2 September

0800-0900	Transport to ICARDA Tel Hadya and registration	
0900-0930	Official opening	Dr M. Solh Dr Saleh Bader Dr A. Sidahmed
0930-1000	Introduction and program	Dr C. Piggin
1000-1030	Group photo and coffee	
1030-1200	Review of results/presentations - research/demos	All scientists
	- Legume group — Cubero Conference	
	- Cereal group — Ali El-Ali Conference	
	- Socioeconomics group — Clemence Conference	
	- Agronomy group — Taher Obaid Conference	
1200-1300	Lunch	
1300-1700	Continue review/preparation	
1700-1730	Transport: ICARDA –Planet Hotel	

Monday, 3 September

0730-0800	Transport: Planet Hotel-ICARDA
0800-0900	Legume performance reports-research/demos
	- Chickpea
	- Lentil
	- Faba bean
	- Vetch

0900-0930	Coffee	
0930-1100	Legumes performance (cont)	
1100-1200	Cereal performance reports-research/demos - Barley - Bread wheat - Durum wheat	
1200-1300	Lunch	
1300-1400	Seminar: Recent advances in wheat improvement	Dr R. Wilson
1400-1600	Cereal performance (cont)	
1600-1630	Transport: ICARDA-Planet Hotel	

Tuesday, 4 September

0730-0800	Transport: Planet Hotel-ICARDA	
0800-0930	Agronomy performance report	
0930-1000	Morning tea/coffee	
1000-1100	Baseline survey report	
1100-1200	Discussion group-agronomy workplan	Chair: Drs Piggin/Pala
1200-1300	Lunch	
1300-1400	Seminar: Wheat Breeding for Salinity Tolerance	Dr. K. Alcock
1400-1600	Agronomy workplan (cont)	
1600-1630	Transport: ICARDA-Planet Hotel	
1930-2200	Official Dinner	

Wednesday, 5 September

0730-0800	Transport: Planet Hotel-ICARDA	
0800-0900	Discussion group - legume workplan	Chair: Drs Sarker/Malhotra
0900-0930	Morning tea/coffee	
0930-1100	Legume workplan (cont)	
1100-1200	Discussion group - cereal workplan	Chair: Drs Grando/Abdalla/Nachit
1200-1300	Lunch	
1300-1400	Seminar: Some thoughts on starting new cropping industries based on experience with field pea in WA	Dr M. Seymour
1400-1600	Cereal workplan (cont)	
1600-1630	Transport: ICARDA-Planet Hotel	

Thursday, 6 September

0730-0800	Transport: Planet Hotel-ICARDA	
0800-0930	Presentation of workplans - Cereals - Legumes - Agronomy - Socio-economics	

0930-1000	Morning tea/coffee	
1000-1100	Workplan reports (cont)	
1100-1200	Discussion on: - training (ICARDA and Australia) - capital items - finance - seed requirements - project review and continuation - other issues	
1200-1300	Lunch	
1300-1430	Discussion (Cont.)	
1430-1500	Close	Drs Bader, Piggin
1500-1530	Transport: ICARDA-Planet Hotel	

Friday/Saturday 7-8 September 2007

Departure to Baghdad, Mosul and Australia according to transport arrangements

Prepared by: Drs. M. Pala/C. Piggin, DSIPS
Date : 28 August 2007

Appendix 2 Participants

Participants

Annual Reporting/Planning Meeting, Iraq-ICARDA-ACIAR Project (CIM/2004/024), 2-6 September 2007, ICARDA, Aleppo, Syria

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Appendix 3 ICARDA Course Schedule and Training Opportunities 2007

Headquarters Training Courses (Aleppo, Syria)*

Short-term Training Courses for 2007

4-5 February	Economics of seed production
March	Participatory plant breeding and seed supply
18-29 March	Seed health testing
25 March-5 April	Molecular characterisation of small ruminants
08-27 April	Integrated crop and livestock production
29 April-10 May	Integrated pest management of cereal and legume crops
29 April -10 May	Cereal Crop Improvement
6-10 May	Seed bank management for germplasm collection
6-17 May	Variety management and quality assurance
7 May-7 June	Water management for improved WUE in dry areas - water harvesting
17-28 June	Seed health testing
26 August-6 September	DNA molecular marker techniques for crop improvement
21 October-1 November	Using modern ICT in library and information management systems
4-15 November	Utilization of expert systems in agricultural research and production
18-29 November	Water productivity concepts and modeling
***	Integrated land managent in drylands
***	Livelihoods characterization, adoption and IA in Economic and Gender Analysis

Announcements for headquarters training courses, including course description and application procedures, will be sent to the concerned national agricultural research systems throughout the year, a few months before each course commences.

Individual Training

Individual non-degree training: Specialized non-degree training is available for individuals or small groups of candidates if officially requested by their national agricultural research systems.

For additional information, please contact: Human Resources Development Unit (ICARDA)
P.O. Box 5466, Aleppo, Syria. Tel: (963-21) 2225112, 2225012, 2213433, 2213477
Fax: (963-21) 2225105 or 2213490. E-mail: ICARDA @CGIAR.ORG.

Appendix 4 Seed to be dispatched from ICARDA to DOA Mosul Iraq for 2007/08 research trials and demonstrations

Crop	Variety	Quantity (kg)	No of containers	Source	Coordinator	Field	Year	Treated
Barley	LRA-YT, 25 entry, 2 Reps, 3 sets	9	3	Barley	Adonis	A31+B3	2007	Treated
	MRA-YT, 25 entry, 2 Reps, 3 sets	9	3	Barley	Adonis	A31+B3	2007	Treated
Bread wheat	Qimma- 6	2	1	Bread	Alaa	B3	2007	Treated
	IZAZ-11	4	1	Bread	Alaa	B8	2006	Treated
Faba bean	ILB 1814	250	5	Faba bean	Labban	A38+A21	07-06	Treated
Chickpea	Flip 86 -5c	120	3	Seed/Chickpea	Hamadeh	B-6	2004	Treated
	FLIP 97-706	20	1	Seed/Chickpea	Hamadeh	B-8	2007	Treated
	FLIP 87-8	64	2	Seed/Chickpea	Hamadeh	B-2	2004	Treated
Durum wheat	Baltagy2	10	1	Seed/Durum	Hamadeh	B-6	2007	Treated
	Baltagy3	10	1	Seed/Durum	Hamadeh	B-6	2007	Treated
	Younes1	10	1	Seed/Durum	Hamadeh	B-6	2007	Treated
	Omrabi3	10	1	Seed/Durum	Hamadeh	B-6	2007	Treated
	Ammar3	10	1	Seed/Durum	Hamadeh	B-6	2007	Treated
	Azeghar2	10	1	Seed/Durum	Hamadeh	B-6	2007	Treated
	Lahaucan	10	1	Seed/Durum	Hamadeh	B-6	2007	Treated
	Maamouri3	10	1	Seed/Durum	Hamadeh	B-6	2007	Treated
	Adnan2	10	1	Seed/Durum	Hamadeh	B-6	2007	Treated
	IcaRasha1	10	1	Seed/Durum	Hamadeh	B-6	2007	Treated
	Lanhaucan	2	1	Seed/Durum	Hamadeh	B-6	2007	Treated
	Icasyr-2	3	1	Seed/Durum	Hamadeh	B-6	2007	Treated
	Cham -3	300	6	GOSM	Niane	B-6	2007	Treated
	Karonia?	4	1					Treated
Vetch	?	50	1					
Lentil	IPA – 98 (Idleb-2)	480	10	Seed/Lentil?	Hamadeh	B-2	2007	Treated
	Idlib-3	480	10	Seed/Lentil	Hamadeh	B-2	2007	Treated
Total		1897	59					