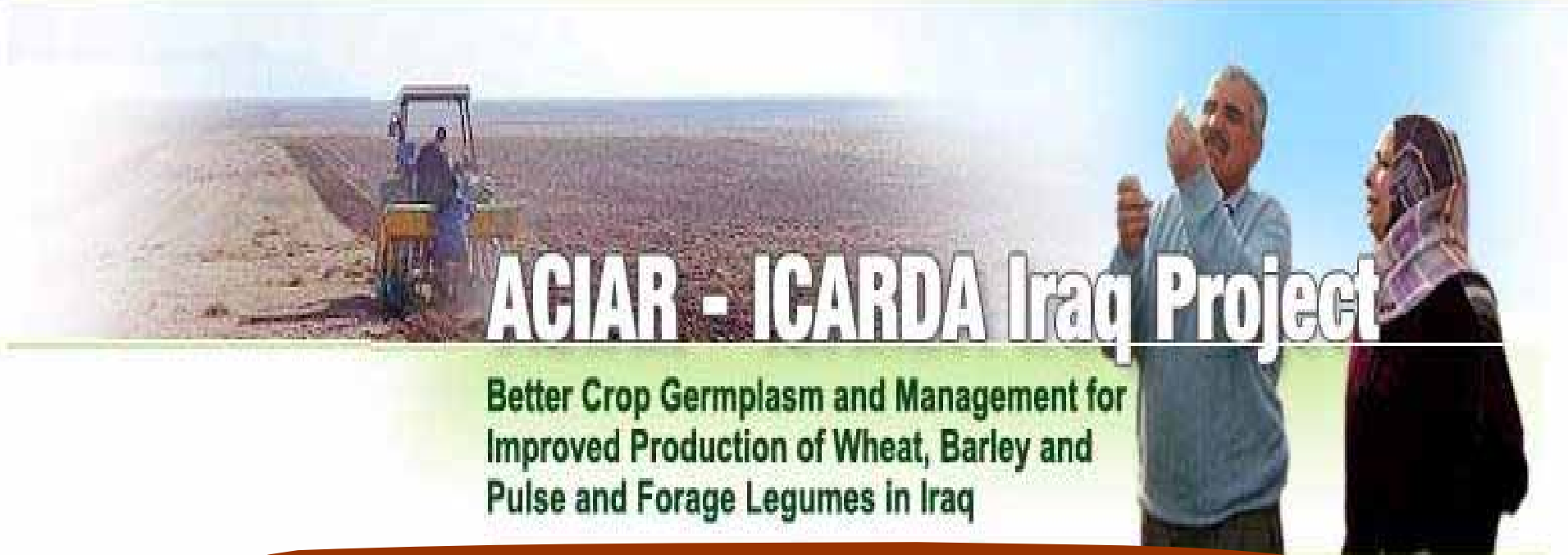




Australian Government
Australian Centre for
International Agricultural Research



Department of Agriculture and Food
Government of Western Australia



ACIAR - ICARDA Iraq Project

Better Crop Germplasm and Management for
Improved Production of Wheat, Barley and
Pulse and Forage Legumes in Iraq

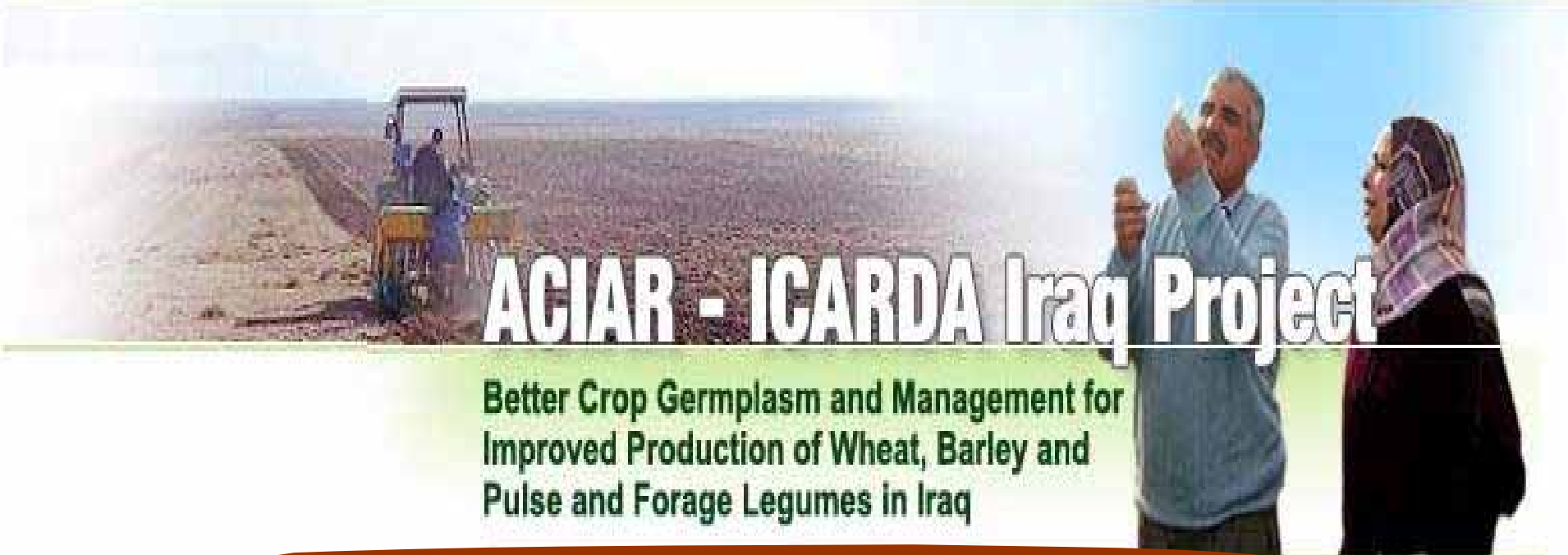
Research Component



Australian Government
Australian Centre for
International Agricultural Research



Department of Agriculture and Food
Government of Western Australia



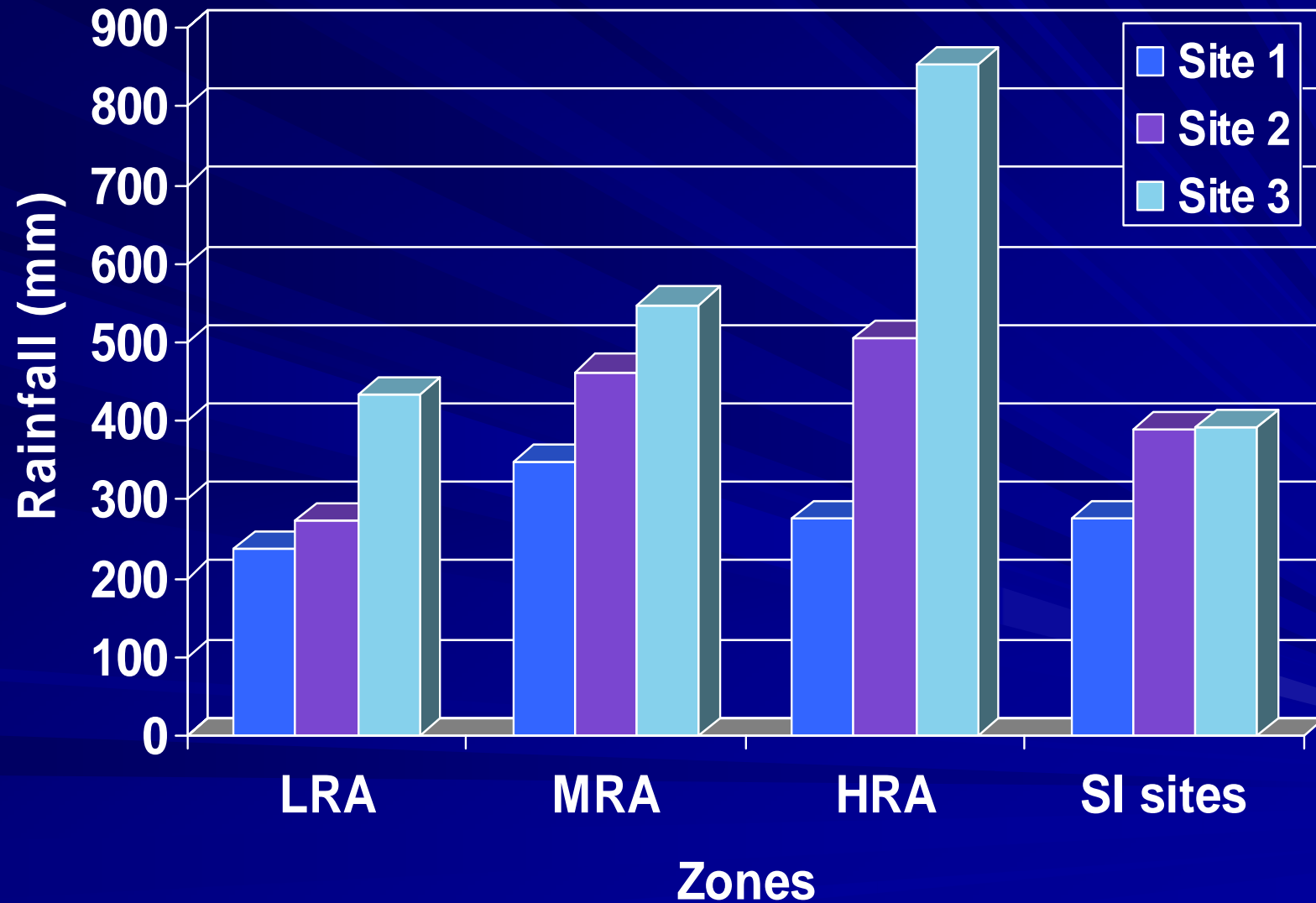
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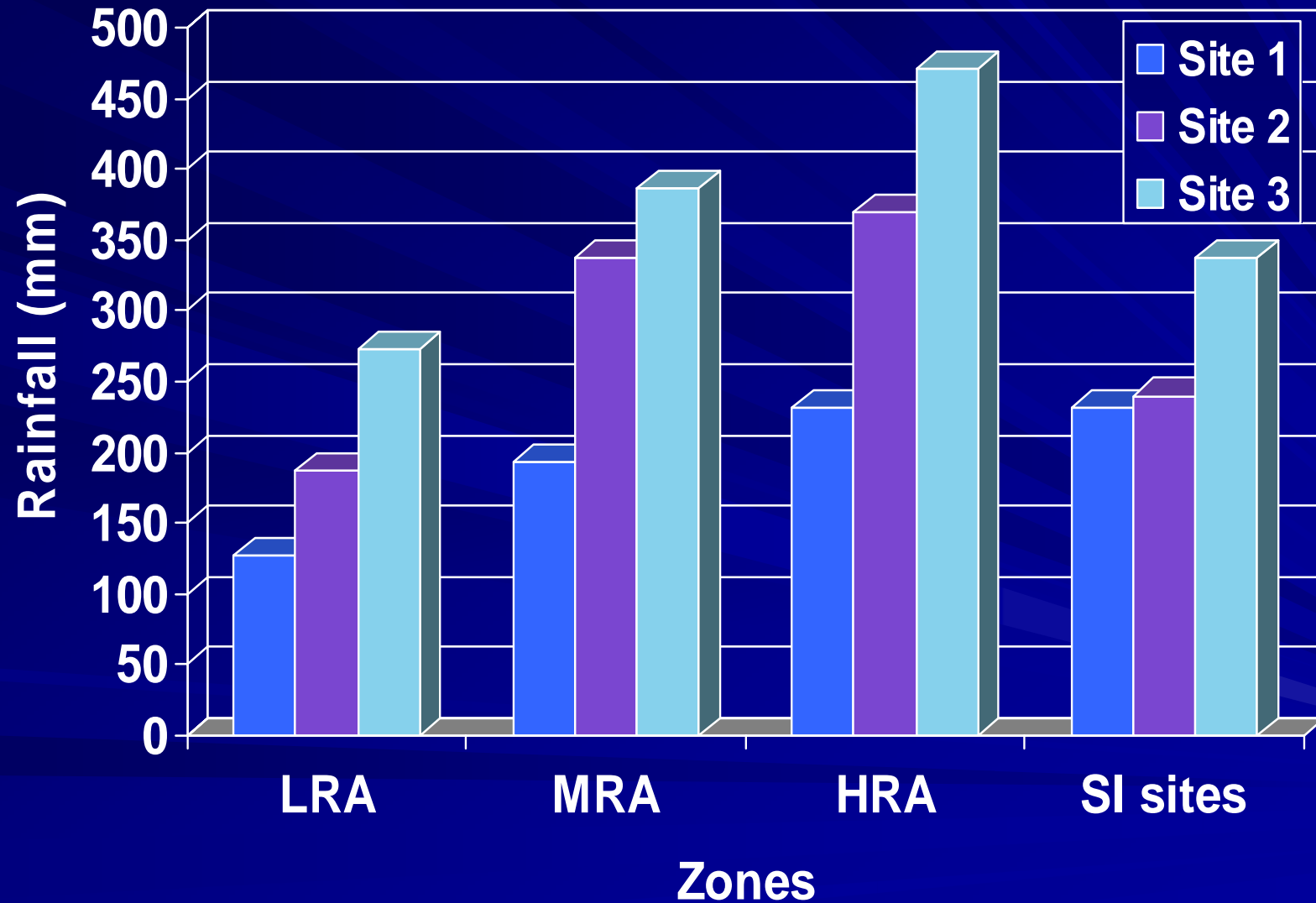
Cereal & Legumes Research Team

Seasonal rainfall across regions (2005-2008)

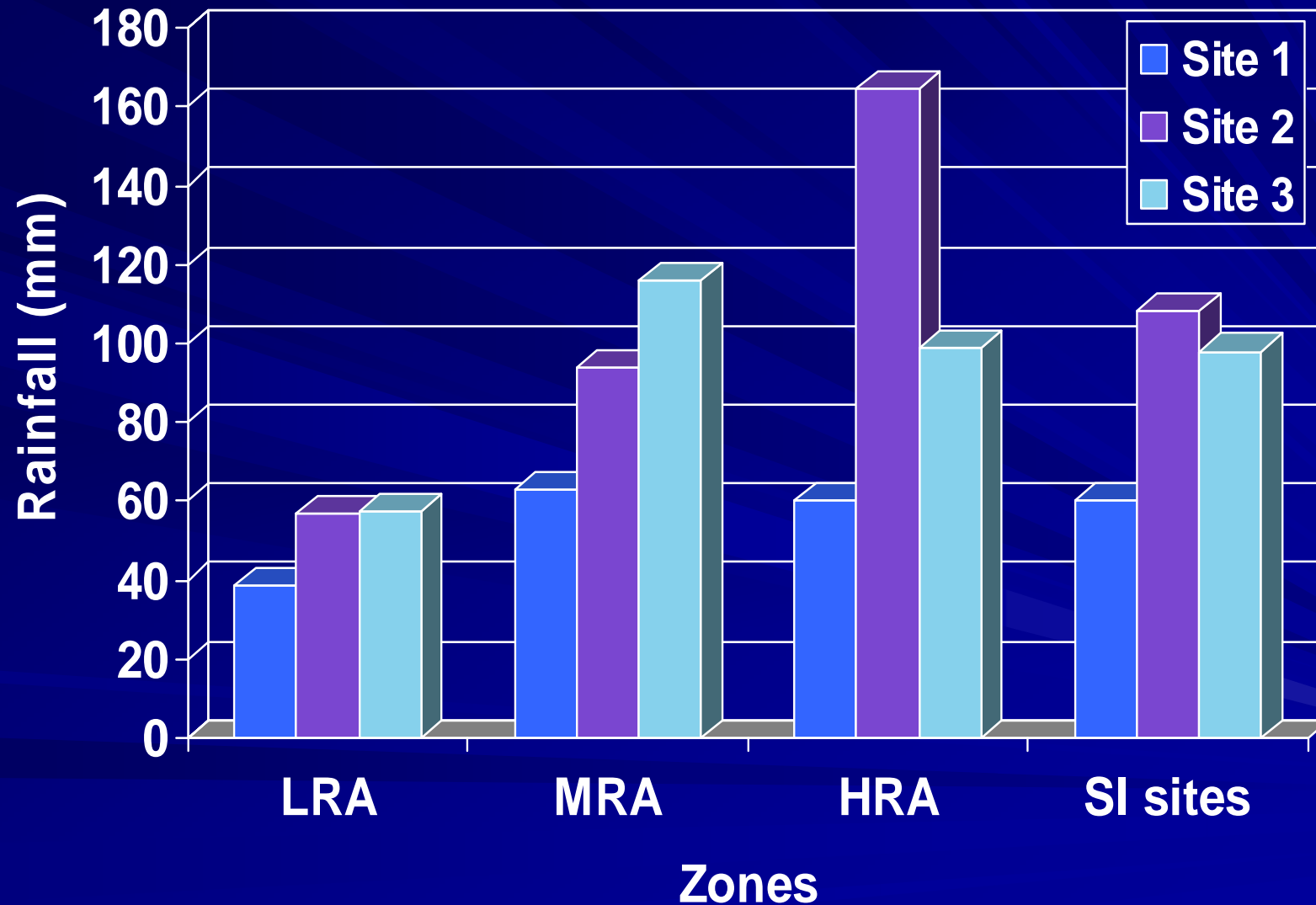
Seasonal Rainfall in Ninevah (2005/06)



Seasonal Rainfall in Ninevah (2006/07)



Seasonal Rainfall in Ninevah (2007/08: Oct-March started on 22-25 Jan)



Cereal Research

2005/06 growing season

- **Barley** (2 trials at Rasheedya):
 - 32 lines selected out of 100 for MRA
 - 46 lines selected out of 100 for LRA
- **Bread wheat** (2 trials at Rasheedya):
 - 30 lines selected out of 81 for MRA
 - 29 varieties from Australia (9), Iraq (4), ACSAD (5), and 2 (USA) were compared and only 6 provided the GY over 700 kg/ha.
- **Durum wheat** (2 trials):
 - 6 lines selected out of 24 for MRA with yield range of 2.06 to 3.61 t/ha vs. 1.0 t/ha of check
 - No lines selected from Durum Observation Nursery for HRA/Irrigated

2006/07 growing season

- **Barley** (2 trials at Rasheedya)
 - 25 lines selected out of 100 for MRA (Obs. Nursery)
 - 15 entries out of 25 provided 800-1100 kg/ha compared to national check with 470 kg/ha grain yield (yield trial)
- **Durum wheat** (1 trial):
 - Durum segregating population of 143 were assessed and several selections were made for next season
- **IPM research for leaf minor on wheat**
 - ZT provided less infestation compared to Chisel and CT for all cultivars

2007/08 growing season

- 3 sets of barley provided by ICARDA for LRA were planted by Research group in Rasheedya.
- 3 sets of barley provided by ICARDA for MRA barley were planted by Mosul University



Legume Research

2005/06 growing season

■ Chickpea (5 trials at Al Kosh):

- 19 lines selected out of 49 of Int. Elite Nursery-winter
- 28 lines selected out of 49 of Int. Elite Nursery-spring
- 20 lines selected out of 41 of Int. nursery for cold tolerance
- 27 lines selected out of 41 of Int. nursery for Ascochyta
- 15 populations selected out of 30 of Int. F4 nursery for Mediterranean region

■ Lentil (3 trials at Rasheedya):

- 17 lines selected out of 64 of Int. Elite Nursery-small seed
- 10 lines selected out of 25 of Int. Elite Nursery-large seed
- 17 lines selected out of 31 of Int. nursery for drought tolerance

■ Faba bean (1 trial at Rasheedya):

- 7 lines selected out of 8 of Int. improved S1 population nursery over the check

2006/07 growing season

■ Chickpea (2 trials at Rasheedya):

- 9 lines selected out of 36 of Int. Elite Nursery-winter (FLIP 93-93C and FLIP 03-113C provided the highest yields)
- 14 lines selected out of 36 of Int. Elite Nursery-spring (FLIP 03-60C and FLIP 01-41C provided the highest yields)

■ Faba bean (1 trial at Rasheedya):

- 7 lines selected out of 8 of Int. improved S1 population nursery (HBP/S0A/2005 gave the highest yield of 895 kg/ha over the local check (410 kg/ha).

■ **Common Vetch: The international observation nursery (16 lines):**

- **Eight lines** were selected and to be tested for the next growing seasons under moderate rainfall area.
- Two cultivars of Lathyrus (*Lathyrus sativus L.*) are Ali-bar and 587 were tested under moderate rainfall area as a new promising forage crop in the region, which can be used for **forage** and **seed production** for animal feeding.
- **Results** of the two growing seasons 2005-2006 and 2006-2007 **showed successful adaptation** to the environment.

Research Report

Comparison between 16 lines of common Vetch(*Vicia sativa* L.) at AL-Rashidiya research station for the growing season 2006/2007 .

Lines	DFLR days	DMAT days	PTHT(cm.)	YLD(2.1m2)	BYLD(2.1m2)	Wt100 seed(gms.)
⊗ 1	124	159	49	329	671	5.95
2	130	162	16	67	221	2.95
3	133	168	58	297	814	4.10
⊗ 4	122	160	42	284	643	5.75
5	135	170	49	176	345	5.20
6	133	167	40	216	695	4.30
⊗ 7	127	160	46	344	801	5.10
8	134	170	41	184	307	4.40
⊗ 9	124	160	39	226	493	5.15
10	134	169	46	232	380	4.85
11	133	169	41	207	446	5.10
⊗ 12	132	161	46	193	398	6.05
13	135	169	41	196	404	5.25
⊗ 14	131	167	39	208	463	5.71
⊗ 15	126	163	42	212	316	6.75
⊗ 16	121	153	30	284	471	5.60

Selected lines	DFLR (days)	DMAT(days)	PTHT(cm.)	YLD(2.1 m²,gms)	BYLD(2.1 m²,gms)	Wt100 seed (gms)
1	124	159	49	329	671	5.95
4	122	160	42	284	643	5.75
7	127	160	46	344	801	5.10
9	124	160	39	226	493	5.15
12	132	161	46	193	398	6.05
14	131	167	39	208	463	5.71
15	126	163	42	212	316	6.75
16	121	153	30	284	471	5.60

DFLR: days from sowing to 50% flowering

DMAT: days from sowing to maturity

PTHT: height of plant (cm.)

YLD: seed yield (2.1m²,gms)

BYLD: biological yield (2.1m², gms)

Legume Demonstrations

Forage Legume Demonstration

Aimed at:

- To increase the productivity of wheat and barley by introducing legumes in crop rotation.
- To introduce forage legumes as vetch for increasing forage productivity .

2005/06 growing season

■ Forage legumes:

- Common vetch (*Vicia sativa* L.)
- CV.IPA2001
- Woollypod Vetch (*Vicia dasycarpa* Ten.)
- CV. Couhak
- Narbon Vetch (*Vicia narbonensis* L.)
- CV. velox.

- **Mixture** of common vetch with local two-row black barley

Limited Rainfall area (< 200 mm):

- Local two-row black barley was mixed with each of common vetch , woollypod vetch and Narbon vetch.
- These activities were cultivated at different locations, which was utilized for sheep grazing at flowering time.

Moderate rainfall Area (200 – 400 mm):

- Cultivation of common vetch at different locations for the purpose of seed production, which contributes to 10% of animal diet.
- Mixture of 75% common vetch with 25% barley for hay making, which is used by farmer in winter season.

Results

2005-2006

On-farm testing

a- Mean of dry matter yields (Kg/ha) of barley/ Vetch mixture and its utilization at three locations under limited rainfall area (200-350mm) for the growing season 2005/2006 .

Characters	Locations		
	Tel – Abta (272mm)	Hatra (237.5mm)	Mahalabia (434mm)
Dry matter	1062 (barley + V.S.IPA2001) 1840 (barley + couhak)	1880 (barley + V.S.IPA2001) 1330 (barley + V.S. 713)	1790 (barley + V.S.IPA2001) 1812 (barley + V.n . Velox)
Utilization	Sheep grazing	Sheep grazing	Sheep grazing

b – Mean of height of plant (cm) and number of branches or tillers / plant of barley/ Vetch mixture .

Characters	Locations								
	Tel – Abta			Hatra			Mahalobia		
	Barley	V.S IPA2001	V.n Couhak	Barley	V.S IPA 2001	V.n Couhak	Barley	V.S IPA 2001	V.n .Velox
Height of plant	40	15	17	50	33	28	50	25	63
No. branches/ plant	4	1	3	4	2	3	5	2	2

V,n .Vicia narbonensis

V . S . Vicia sativa

Barley . two – rowed black (local)

On-farm testing

a- Mean of dry matter and seed yields (Kg/ha) of barley/vetch at two locations under moderate rainfall (350 – 450mm) for the growing season 2005/2006

Characters	Locations	
	Hamdanyia (548mm)	Telkeif (462.5 mm)
Dry matter	4528 (barley + V.S. IPA2001)	5180 (barley + V.S. IPA2001)
Seed yield	1280 (mixture)	600 (mixture) delay in harvesting

b – Mean of height of plant (cm) and number of branches or tillers / plant of barley/ Vetch mixture .

Characters	Locations			
	Hamdanyia		Telkeif	
	barley	V.S.I PA2001	barley	V.S.I PA2001
Height of plant	68	59	74	65
No. branches/ plant	2	2	4	3

V,n .Vicia narbonensis

V . S . Vicia sativa

Barley . two – rowed black (local)

On-farm testing

a- Mean of dry matter and seed yields (Kg/ha) of barley/ vetch mixture at three locations under moderate rainfall (350 – 450mm) for the growing season 2005/2006

Characters	Locations					
	Bashiqa (349 mm rainfall) V.S.IPA 2001 V.n.velox		Hamdanyia (548mm) CV. couhak		Telkeif (462.5 mm) L.S.587 L .S .Ali -bar	
Dry matter	5726	5228	3621		4276	4020
Seed yield	820	700	1700		1080	1040

b – Mean of height of plant (cm) and number of branches / plant

Characters	Location					
	Bashiqa (349 mm) V.S.IPA 2001 V.n.velox		Hamdanyia CV. couhak		Telkeif (462.5 mm) L.S.587 L.S.Ali -bar	
Height of plant	65	75	90		76	62
No. branches/plant	2	1	2		2	2

L.S. Lathyrus sativus , V . S .
Vicia sativa , V . S . Vicia
narbonensis

2006-2007 Growing Season

Limited Rainfall area (< 200 mm):

- The demonstration activities of the second growing season were changed according to the results obtained in the first growing season, 2005-2006.
- Mixture of barley with woollypod vetch and Narbon vetch were cancelled.
- Therefore the remaining demonstration activity was mixture of common vetch with barley only.

Results

2006-2007

Table(1): The amount of rainfall (mm.) and its monthly distribution for the growing season 2006/2007 at different locations:

months	Limited rainfall area			Moderate rainfall area			
	Mahalabia	Tel- Abta	Hatra	Telkief	Hamdanyia	Bashiqa	Mosul centre
October	102	38	33	43	63	19	27
November	3	27	-	40	23	15	10
December	30	17	11	53	30	34	45
January	29	22	23.5	32.5	37	26	23
February	66	61	35	68.5	142	44	81
March	14	13	4.5	34	40	23	31
April	29	9	7	35.5	40	37	34
May	-	-	-	-	46	-	7
	273	187	114	306.5	381	198	258

Source: Ninavah Agriculture Directorate

*

Table(2): Mean of dry matter yield of mixture (kg/ha) , height of plant (cm.) of common vetch and its utilization at three locations for the growing season 2006/2007

Characters	Locations		
	Tell- abta (187mm.)	Hatra (114mm.)	Mahalabia(267mm.)
Dry matter Yield	201	176	350
Height of plant	8	8	12
Utilization	Sheep grazing	Sheep grazing	Sheep grazing

Table (3): Mean of dry matter, biological and seed yields(kg/ha) and height of plant (cm) of vetches and lathyrus at Telkief location for the growing season 2006/2007

Species	Dry matter yield	Biological yield	Seed yield	Height of plant
Vicia sativa L.	891	2905	780	30
Vicia dasycarpa Ten.	658	2611	591	34
Lathyrus sativus	838	3372	856	32

Food Legumes Demonstration

Chickpeas , Fababean , Lentil

The sowing date and seeding rate and fertilizer

Crop	Sowing date	Seeding rate Kg/dounm	Fertilizer Kg/dounm
Winter chickpeas	15/1/2007	30	15 Dap
Spring chickpeas	9/3/2007	30	15 Dap
Fababean	12/1/2007	40	15 Dap
Lentil	18/1/2007	30	15 Dap

The seed yield (kg/dounm) of five cultivars of chickpeas at Alqush location

Cultivars	Planting method	Area /Dounm	Production (Kg)	Seed yield (Kg/ Dounm)
Winter chickpea				
Philip197	Chisel	0.75	100	133
Dijla	Chisel	1.5	165	110
IPA510	Disk	6	2100	350
Ghab 4	Disk	12	3125	260
Local	Disk	12	0	0
Spring chikpea				
Dijla	Disk	1.5	225	150
IPA510	Disk	2	350	175
	Z.T	2	300	150
Ghab 4	Disk	8	1600	200
Local	Disk	8	0	0

Seed yield of two cultivars of faba bean at Al-Sheekhan location

Cultivars	Planting method	Area /Dounm	Production (Kg)	Seed yield (Kg/ Dounm)
Akwadlji	Chisel	4	110	28
	Control	4	120	30
	Con.	2	45	22.5 propagation
ILB 1814	Chisel	1.5	55	37
	Control	1.5	59	39.3

2007-2008 Growing season

- **No** cultivation of **forage legume demonstration** activities under limited and moderate rainfall areas because of dry weather, which dominated the season.
- **As research program**, eight selected lines of common vetch was cultivated on 27th November 2007 at Al-Rasheedia Research station.
- Seeds of these lines were germinated on 25th February.
- There will be **no chance** for the vetch **to complete its life cycle** because of severe drought.

Lessons learnt and implications for research planning (1)

■ Major constraints:

- more man power needed
- better security
- lack of logistics – transportation
- need for movable fences to protect experiments
- better seed storage
- seed production for elite varieties
- market distortion (unfavorable marketing environment due to very low prices of imported produce)
- reluctance to use fertilizers

Lessons learnt and implications for research planning (2)

■ Changes needed for improved efficiency in project implementation:

- change from public to private vehicles for security in project work
- need to concentrate on timely sowing
- timely harvesting to avoid grazing by sheep
- rebuild the poultry industry based on small-seeded faba bean genotypes
- seed containers
- no cold tolerance nursery
- supply of large-seeded chickpea

Thank You...