

Linked ICARDA agronomy research 2005-06, 06-07, 07-08

- » zero-till and stubble mulching**
- » alternative crops**

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

Review and planning meeting, ICARDA, 13-17th April 2008

Zero-tillage

Objective: To evaluate alternative crop establishment techniques in Mediterranean environments

2005-06 Large plot demonstrations

- **wheat**
- **chickpea**

- **conventional cultivation**
- **zero-till/stubble retained**

Zero-tillage 2006-07

Objective: To evaluate alternative crop establishment techniques

Trials

- 1. chickpea after wheat (Field C5)****
- 2. oats after wheat (Field C5)**
- 3. wheat after lentil (Field C16)-LT trial****
- 4. wheat, chickpea, barley, lentil rotation (Field B4)-LT trial**

Treatments

- conventional tillage**
- zero-till/stubble retained**



Zero-tillage

Chickpea on wheat stubble 2006-07

Conventional till



17 Sept 2006

Zero-till



Glyphosate 15 Nov 06
Sowing 27/28 Nov 2006
Gesagard 5 Dec 2006
Harvest 14 June 2007



Zero-tillage

Chickpea on wheat stubble 2006-07

Conventional till



7 Feb 2007

Zero-till



8 Jan 2007

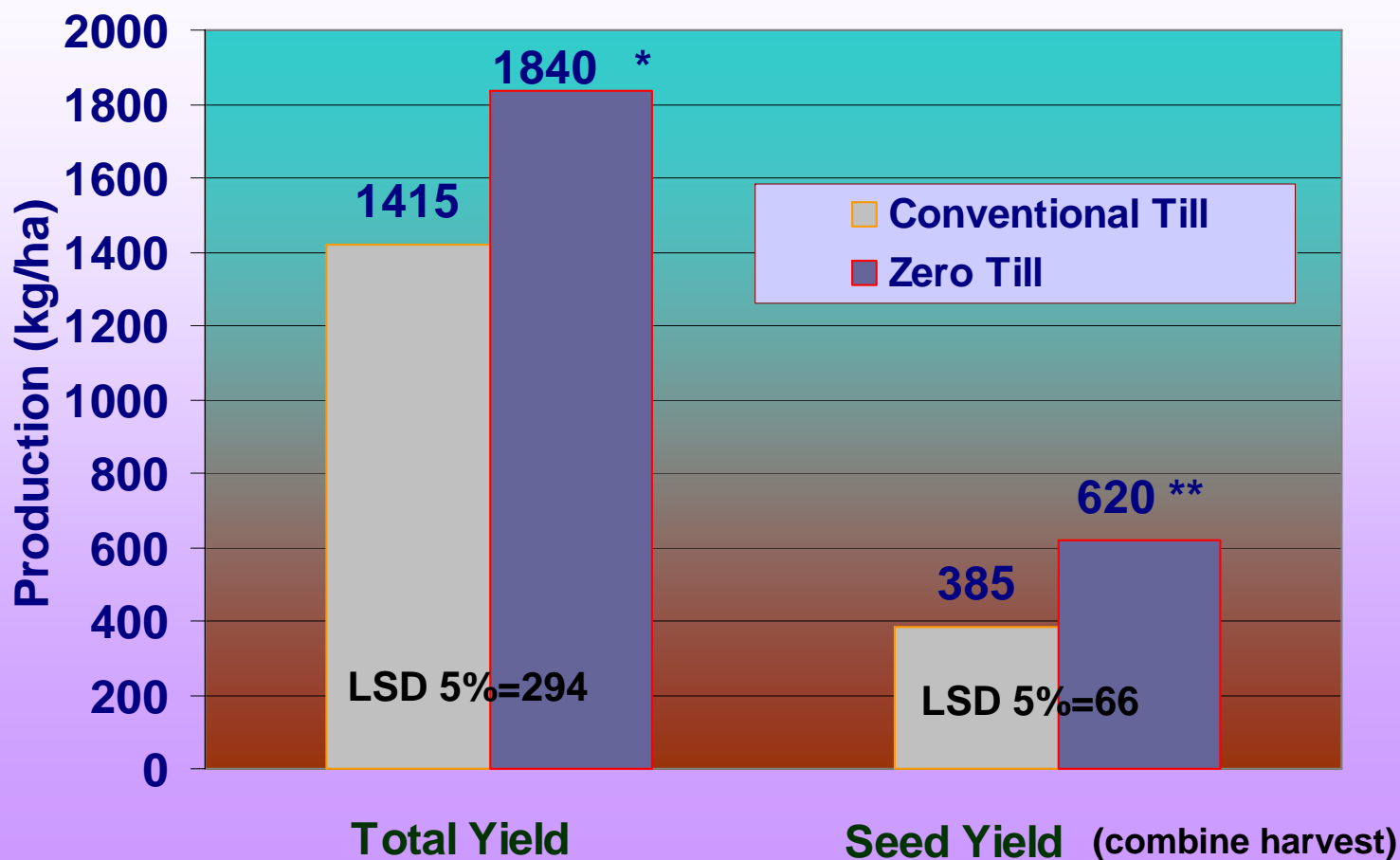
Zero-tillage

Chickpea on wheat stubble

2006-07



Total and Seed Yield of Chickpea under ZT and CT Systems
(C5, 2006-2007, TH)



Zero-tillage

2006-07



Chickpea on wheat stubble +/- monitor* (grain yield kg/ha)

(combine harvest)

	- monitor	+ monitor	Diff
CT	505	270	235
ZT	650	590	60
Diff	145	320	
LSD 5%			93

* Sulfonylurea herbicide for control of broadleaf weeds in cereals

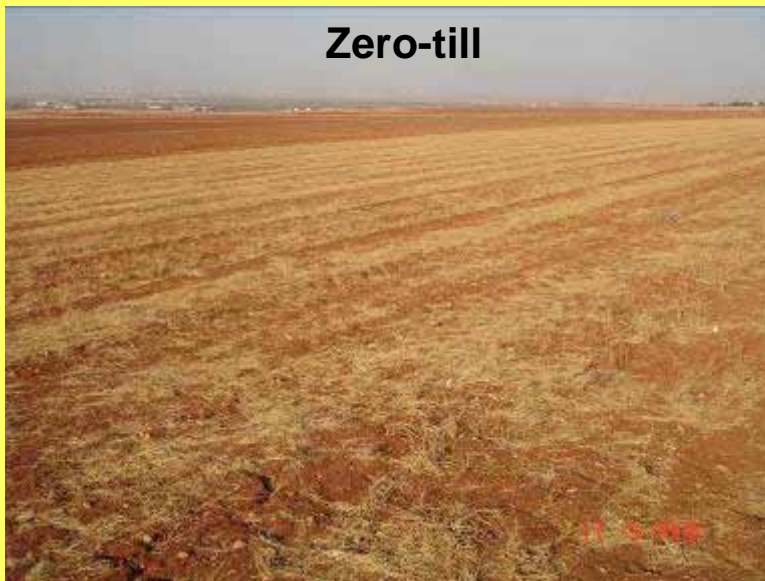
Zero-tillage

Wheat on lentil stubble (C16)

Conventional till



Zero-till



2006-07



Glyphosate 9 Nov 2006

Sowing 10-12 Nov 2006

Harvest 17 June 2007



Zero-tillage

Wheat on lentil stubble (C16)

2006-07



Conventional till

8 Jan 2007



Conventional till

Zero-till

7 Mar 2007



Zero-till

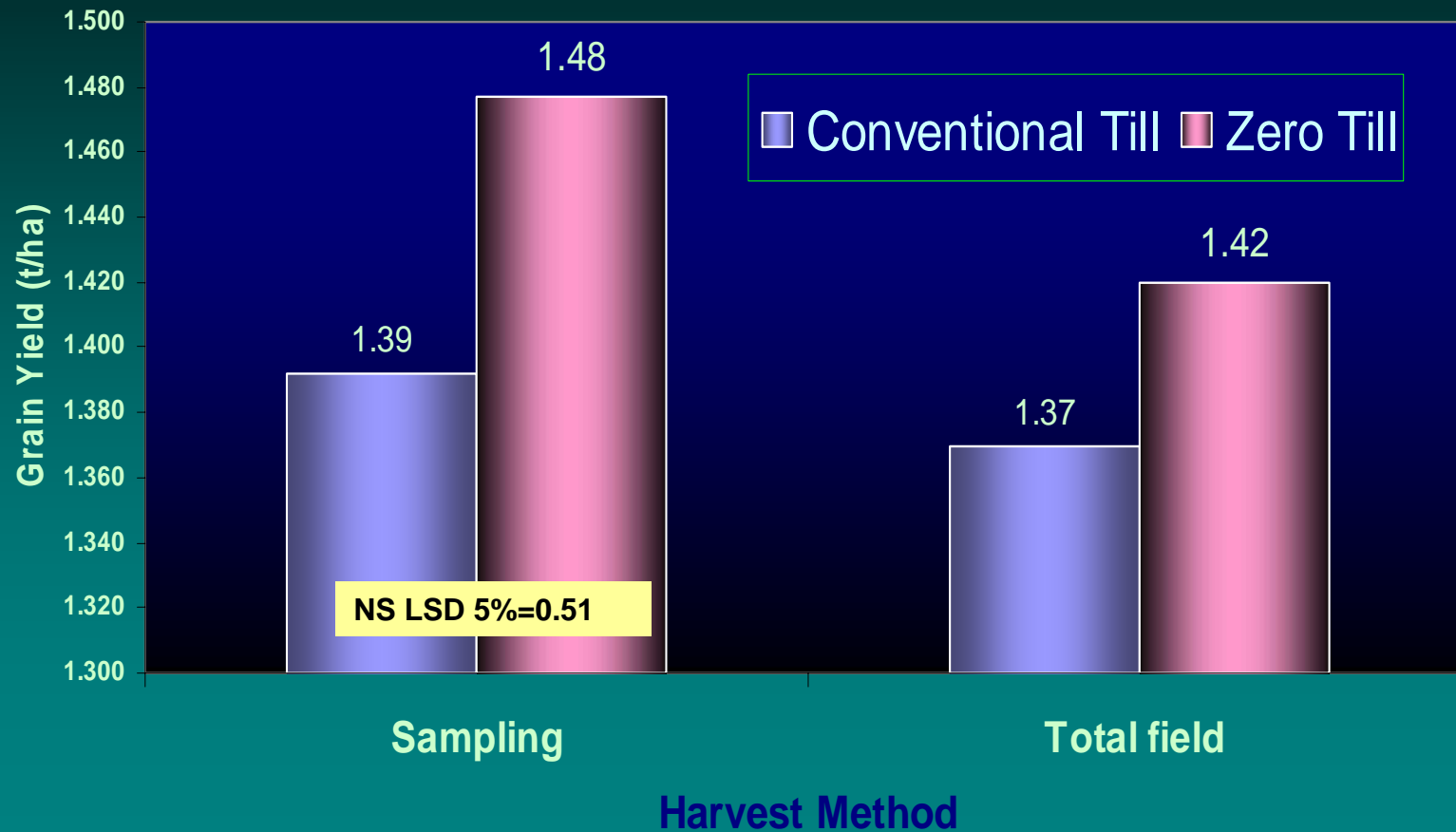




Zero-tillage Wheat on lentil stubble

(C16)
2006-07

Wheat productivity under ZT and CT systems (C16, 2006-2007, TH)



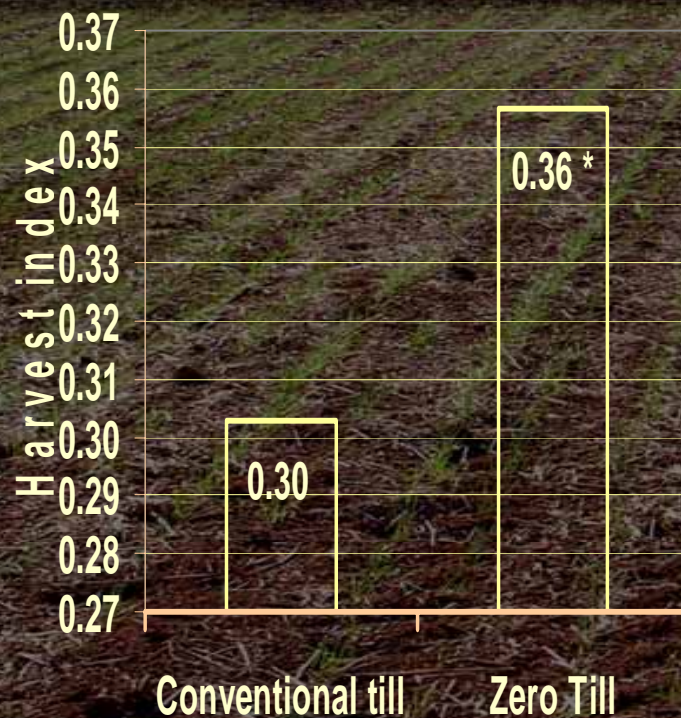
Zero-tillage

Wheat on lentil stubble (C16)

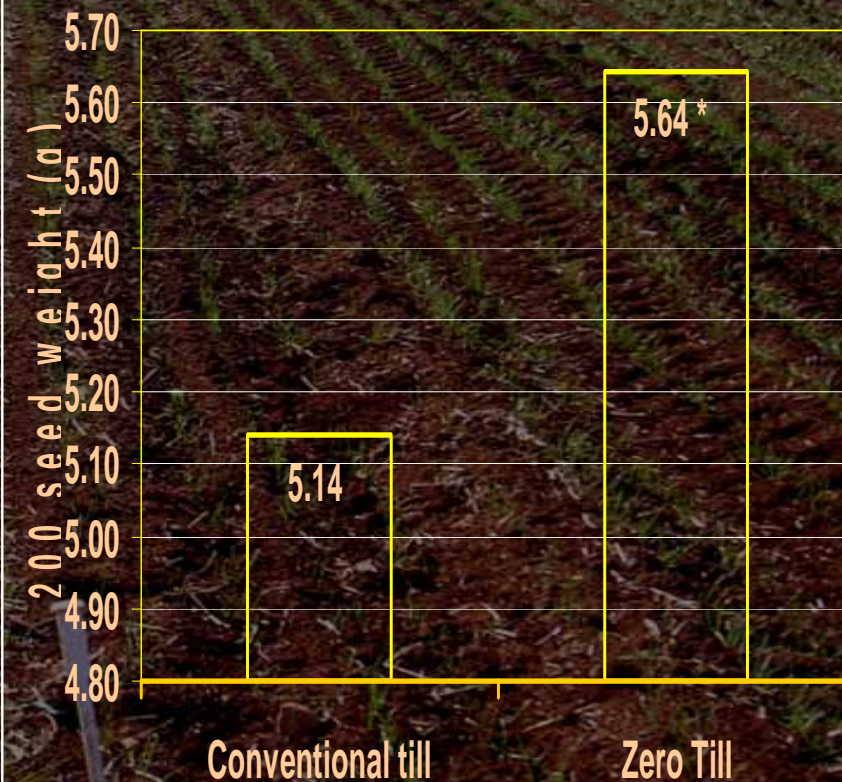


2006-07

Effect of CT vs ZT on harvest index of breadwheat C16, 2006-2007 TH



The effect of CT vs ZT on seed weight of breadwheat C16, 2006-2007 TH



Zero-tillage 2007-08

Objective: To evaluate alternative crop establishment techniques

Trials

- lentil after wheat (C16) – LT trial
- wheat, barley, chickpea, lentil rotation (B4) – LT trial

Treatments

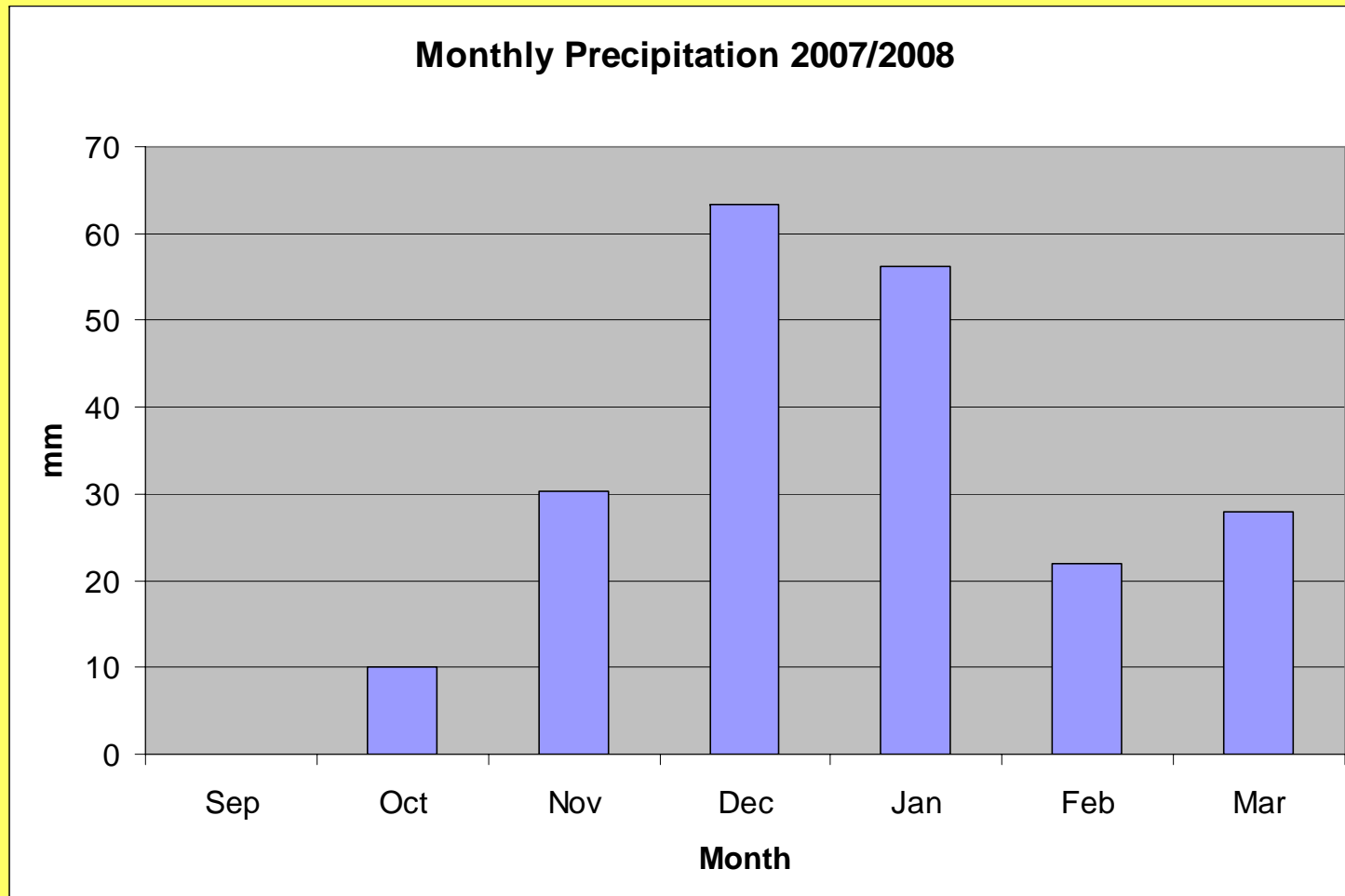
- conventional cultivation
- zero-till/stubble retained

Time of sowing (only C16)

- early
- late

ICARDA rainfall

Total to 10 April = 211mm



Lentil on wheat stubble – C16

2007-08

Zero-till



**Early sowing
28-29 Nov 07**

Conventional till



**Late sowing
23 Dec 07**

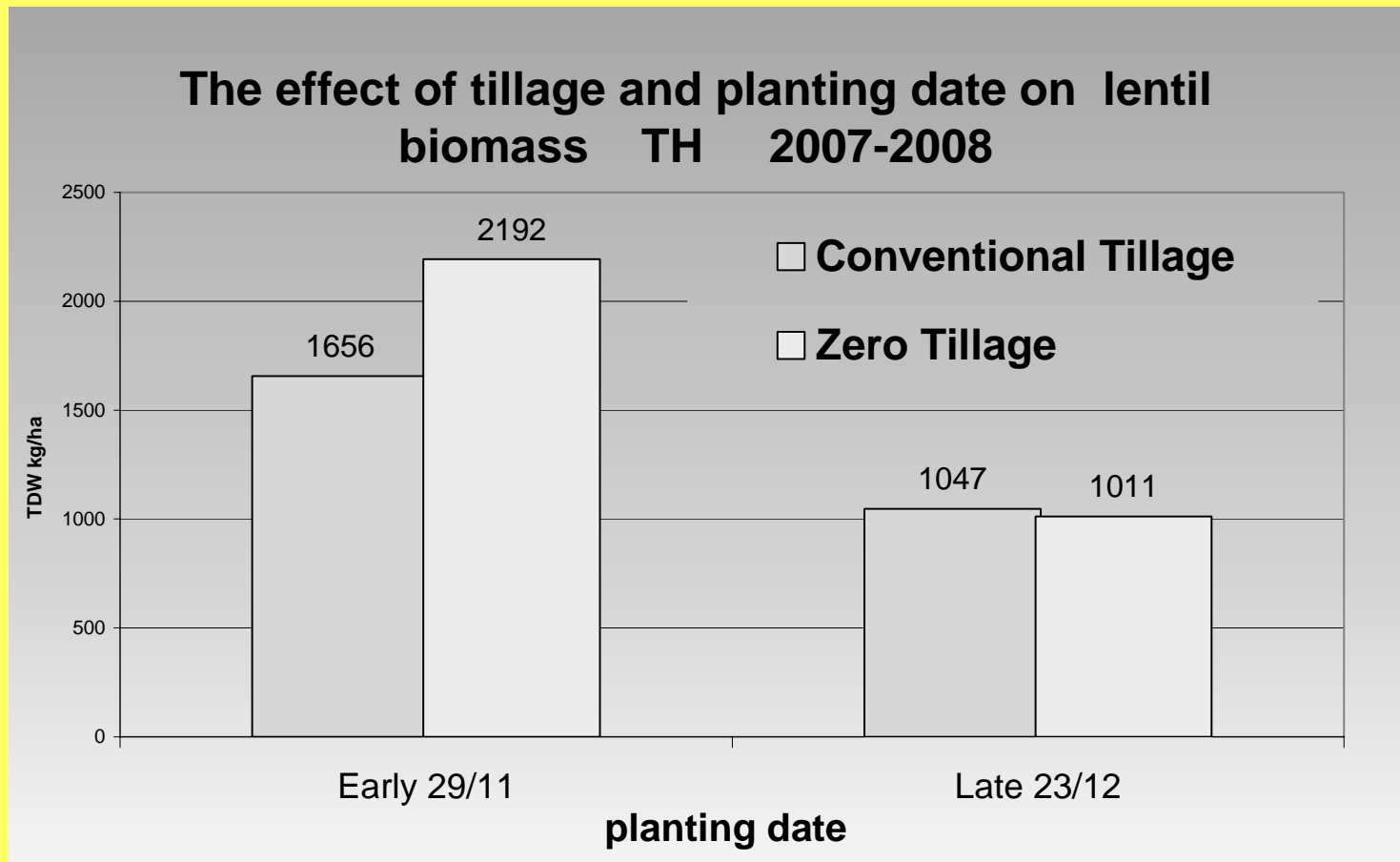




Lentil on wheat stubble – C16

2007-08

5 April 2008



LSD: Within T = 317; T x D = 357



Zero-tillage 4 crop rotation – B4 2007-08

2 April 08

Zero-till



Barley

Wheat

Chickpea

Lentil



Conventional till



1. excellent training and discussion facility with scientists, students, farmers



2. demonstrations and field days



3. local manufacture of ZT seeders

Testing of alternative crops

2005-08

Objective: To evaluate alternative dryland crops for Mediterranean environments

- Oats
- Oilseeds
- Legumes

1 December 2005



Oats

2005-06

- 1. Brusher**
- 2. Carrolop**
- 3. Euro**
- 4. Kangaroo**
- 5. Mitika**
- 6. Possum**
- 7. Wintaroo**
- 8. ICARDA Check**

Grain, feed, forage

Planting date: 30 Nov 2005

Replicates: 4

Fertilizer: 50kg/ha N on 5 March 2006 (tillering)

Harvest date: 5 June 2006

Oats

6 April 2006



Oats

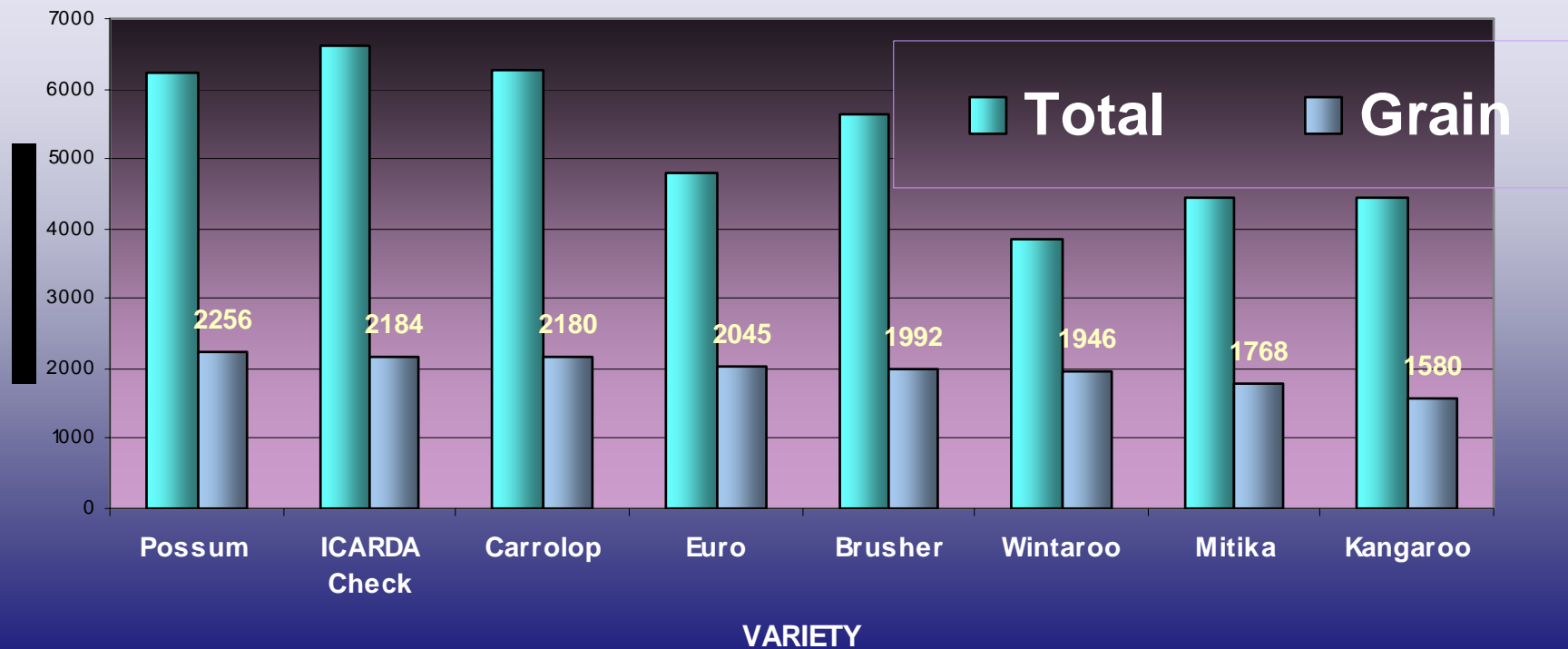
10 May 2006



Oats

2005-06

Total dry matter and grain yield of oat varieties Tel Hadya Syria 2006



Total DM NS (LSD 2178)
Grain yield NS (LSD 538)

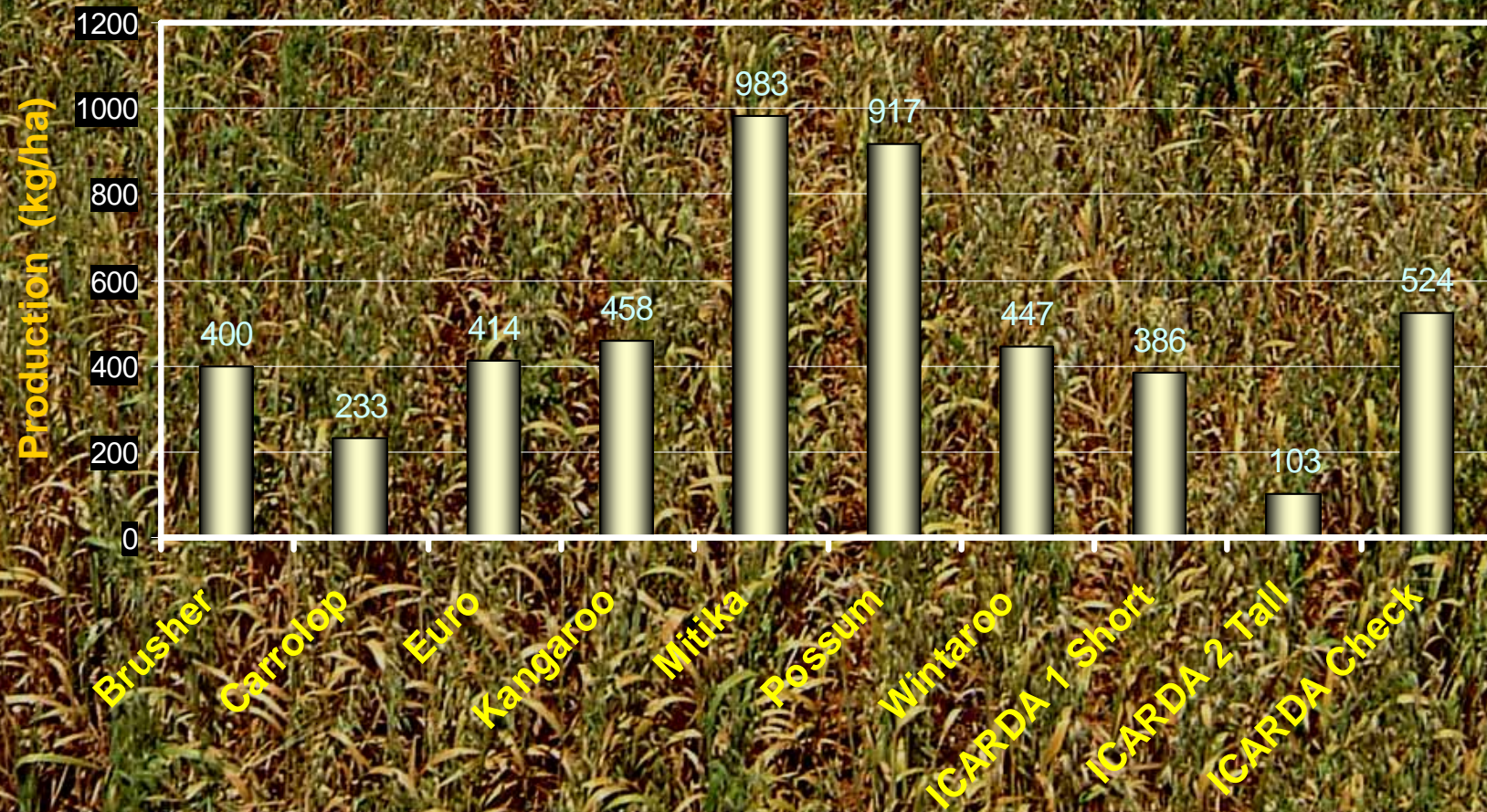
Oats

2006-07

- 1. Variety comparison (4 reps) – very poor emergence**
- 2. Seed production - successful**

Oat seed production 2006-07

Productivity of imported Australian oat varieties at TH, 2006-2007



Oats

2007-08

Continuing

- 1. Variety comparison (4 reps)**
- 2. Seed production**

Sown 6 Dec 2007

Photos 19 Mar 08



Peas

2005-06

- 1. Dunwa**
- 2. Helena**
- 3. Kaspá**
- 4. ICARDA Check**
- 5. Local check**

Grain, feed

Planting date: 30 Nov 2005

Replicates: 0

Harvest date: 20 May 2006

Peas

2005-06

Local peas



Kaspa peas



ICARDA peas



6 April 2006

Peas

20 May 2006

Local peas



Kaspa peas

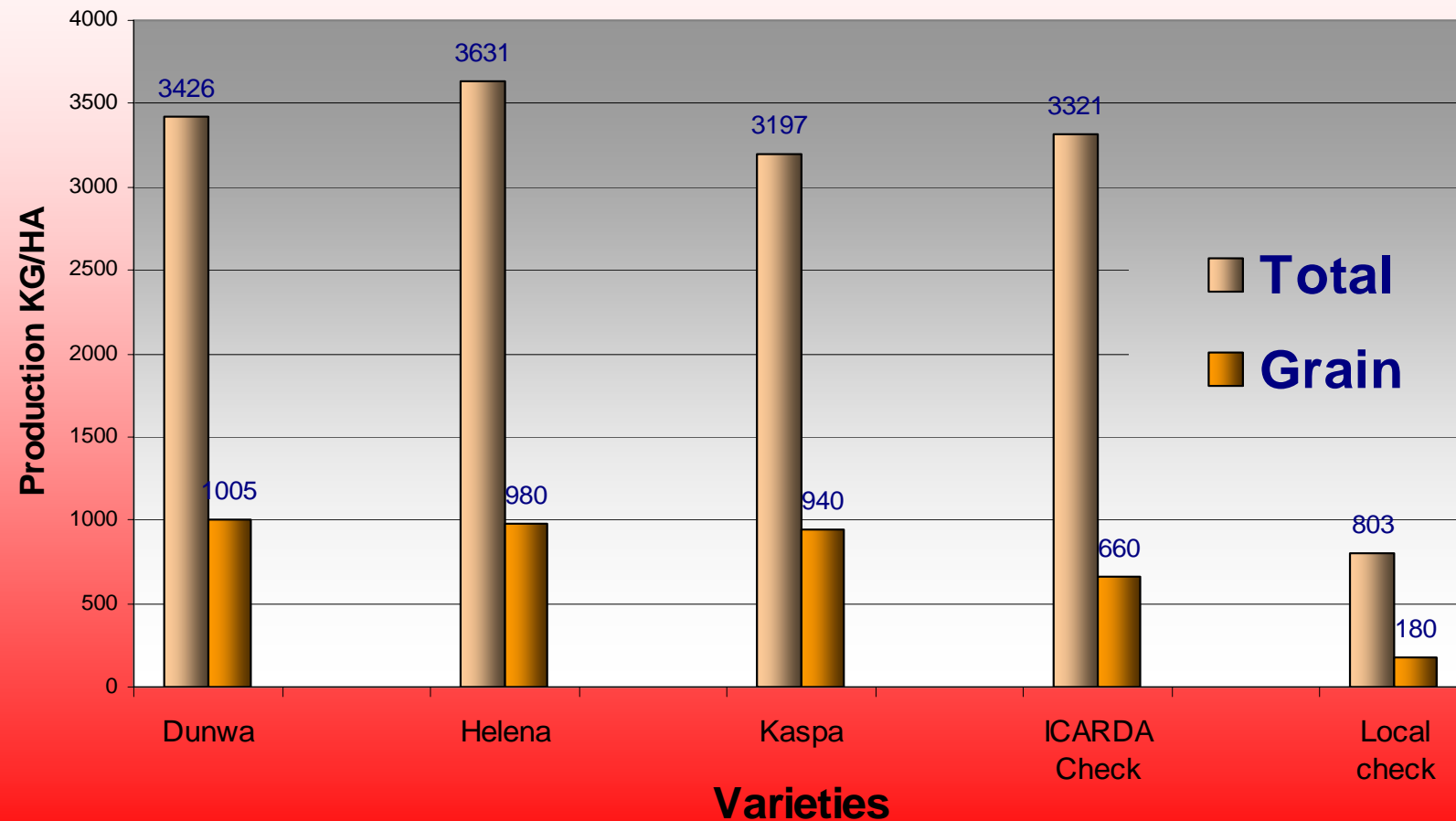


ICARDA peas



Peas

Total biomass and grain yield (kg/ha) of pea varieties Tel Hadya, Syria 2006



Peas

2006-07

Crop failure (Monitor SU residues)

CLIMA supplied more seed

2007-08

Continuing

1. Variety comparison (4 reps)

Sown 7 Jan 08

Photos 2 Apr 08



Dunwa



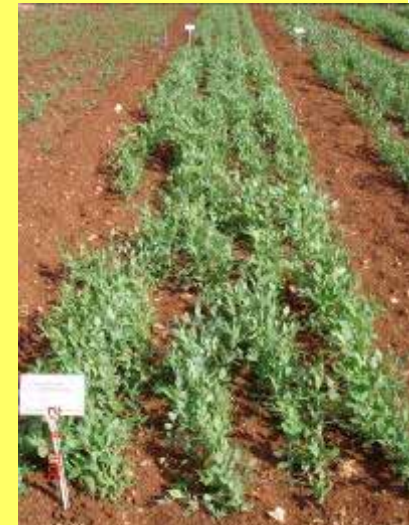
Helena



Kaspa



ICARDA check



Oilseeds

Botanical name	Variety	Common name
Brassica juncea	Sel 21, 4355, 82NO00-67, 82NO00-98	Indian mustard
Brassica carinata	94024.2, 195923.5.2	Ethiopian mustard
Brassica napus	Tramby DB62-OOW2, DB76-OOW6, DB163-OOW2	Canola
Brassica rapa	91182, Pusa Kalyana	Turnip rape
Camelina sativa	4164, 4183	False flax
Camelina alyssinica	337110, 94053	Crambe, Camelina
Sinapis alba	Tliney, 94488	White/English Mustard
Linum usitatissimum	Glenelg, 110637	Linseed, Linola

Uses: oilseed, feed, mustard, soil conditioner (fumigant, macropores)

Planting date: 30 Nov 2005

Replicates: 4

Harvest date: 16-21 June 2006

Oilseeds

10 May 2006



Brassica juncea 82NO00-98



Brassica juncea Sel21

Sinapus alba Tliney

6 April 2006



Oilseeds

10 May 2006



Camelina sativa 4164

Camelina sativa 4183

Linum usitatissimum Glenelg



Oilseeds

6 April 2006

Brassica rapa Pusa Kalyana



Brassica napus DB76-

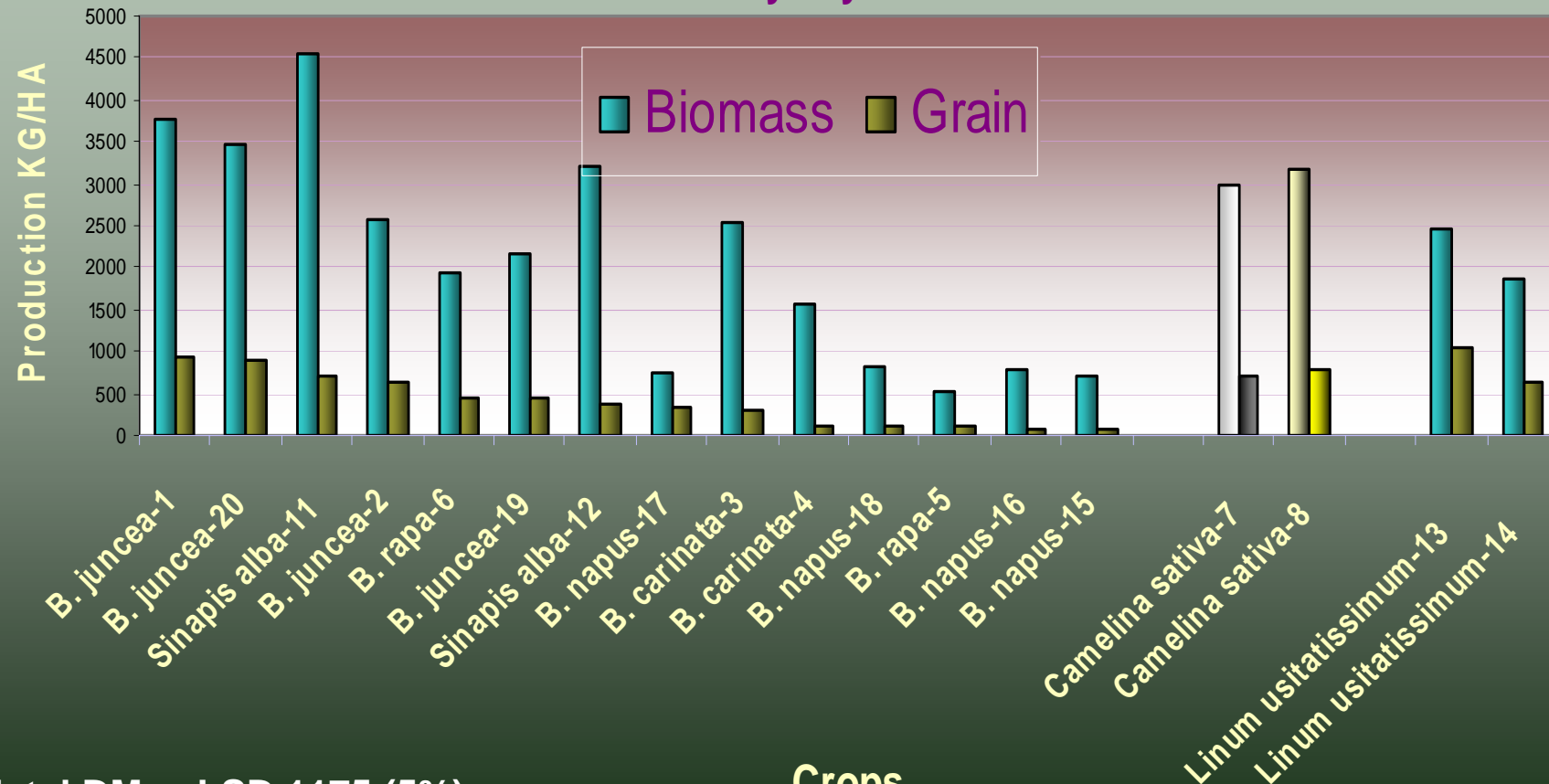


Brassica carinata 94024.2



Oilseeds

Biomass and seed yield of oilseed crops
Tel Hadya Syria 2006



Total DM LSD 1175 (5%)
Grain yield LSD 303 (5%)

Crops

Oilseeds

2006-07

Crop failure (Monitor SU residues)

2007-08

Continuing

Variety comparison (4 reps) – very poor establishment

2005-08 ICARDA agronomy research

- **zero-till and stubble mulching**
 - grain yield: ZT \geq CT in all trials
 - needs more research and promotion
 - very promising and likelihood of uptake high
 - comparable or greater yields
 - lower costs
 - interest from machinery manufacturers and farmers
- **alternative crops (oats, brassicas, peas)**
 - oats and peas showing good potential
 - brassicas difficult to establish
 - all inconsistent and need more research