



## ARIMNet2 Young Researchers Seminar

“How to better involve end-users throughout the research process to foster innovation-driven research for a sustainable Mediterranean agriculture at the farm and local scales.”

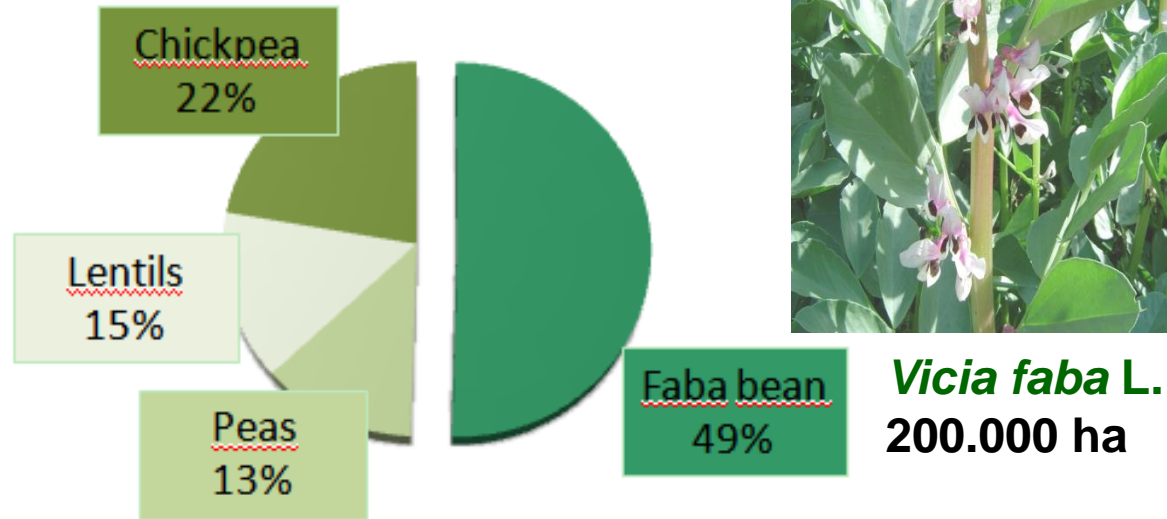
30 May - 3 June 2016, Institut Agronomique Méditerranéen de Montpellier (IAMM), France

**Crop improvement in faba bean (*vicia faba* L.)  
toward drought stress through the exploitation of  
genetic diversity**

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# CONTEXT & CHALLENGES



Acreage (%) of legumes in Morocco for 2015 (MAPM; 2015)



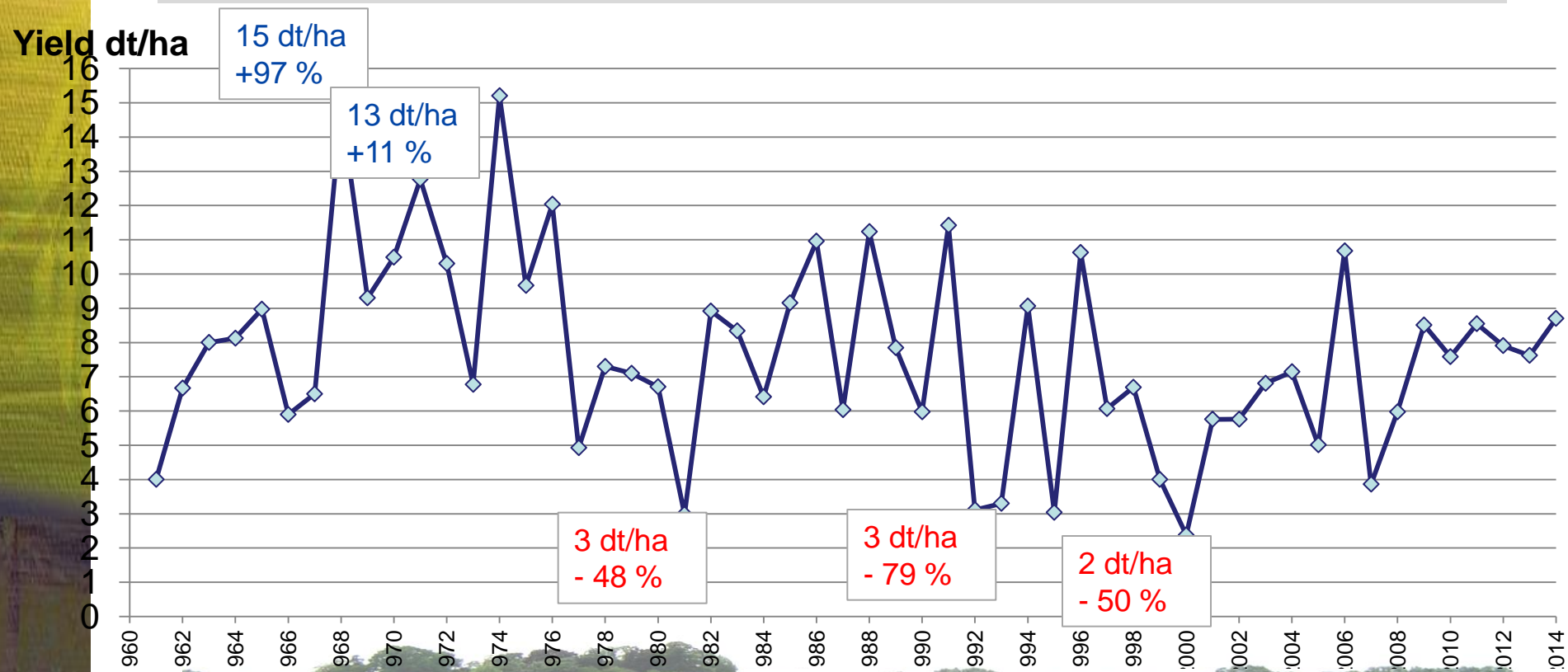
## Morocco is a center of diversity

- High genetic variability and panel of several landraces
- Over 90% of the farmers are cropping traditional populations



# CONTEXT & CHALLENGES

Evolution of faba bean grain yield (dt/ha) across the years in Morocco



- Low yield potential (8dt/ha Morocco; 18 dt/ha World)
- Instability of yield due to biotic and abiotic stresses
- Drought is the major abiotic stress (80 % yield loss)
- Drought is becoming increasingly a structural feature of the Moroccan climate.



# OBJECTIVE & HYPOTHESES

## Objective(s) / Research question(s)

1. Evaluation of a collection of Moroccan landraces through a participatory approach
2. Identification of drought tolerant populations

## Hypotheses

- The Moroccan faba bean landraces contain a genetic diversity toward drought stress
- Drought tolerant Moroccan landraces show a higher tolerance compared to released cultivars
- Existence of a compromise of the level of the tolerance with the level of productivity for given landraces



# METHODOLOGY



**1. Collections of accessions**  
(60 landraces; Taounate and Midelt)

**2. Questionary**  
(Farmers ; Taounate and Midelt)  
Understanding of farmer management practices

**3. Phenotyping**  
Field trials (with and without water stress)  
Controlled conditions (with and without water stress)

**4. Genotyping**  
AFLP analysis for genetic diversity of the landraces

# EXPECTED RESULTS / IMPACT (INNOVATION)

## Farmers

- Identification of drought tolerant populations
- Valorisation of farm based indigenous genetic diversity  
Establishment of the in situ conservation of faba bean genetic diversity

## Breeders

- Implementation of drought tolerant populations as parents in faba bean breeding programs

## Researchers

- Development of inbred lines derived from the populations of interest to identify, through QTL mapping, the genes involved in the drought stress tolerance.



# PROPOSED PARTNERSHIP

## Partners

- Research institution IAV Hassan II
- Extension service in Taounate and Midelt

## Stakeholders

- Farmers community in Midelt and Taounate
- Breeding company of faba bean based in Morocco





