Framework for an enhanced collaborative partnership U of MN - IAV Hassan II Sustainable Agriculture Systems

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University of Minnesota, August 8th 2014

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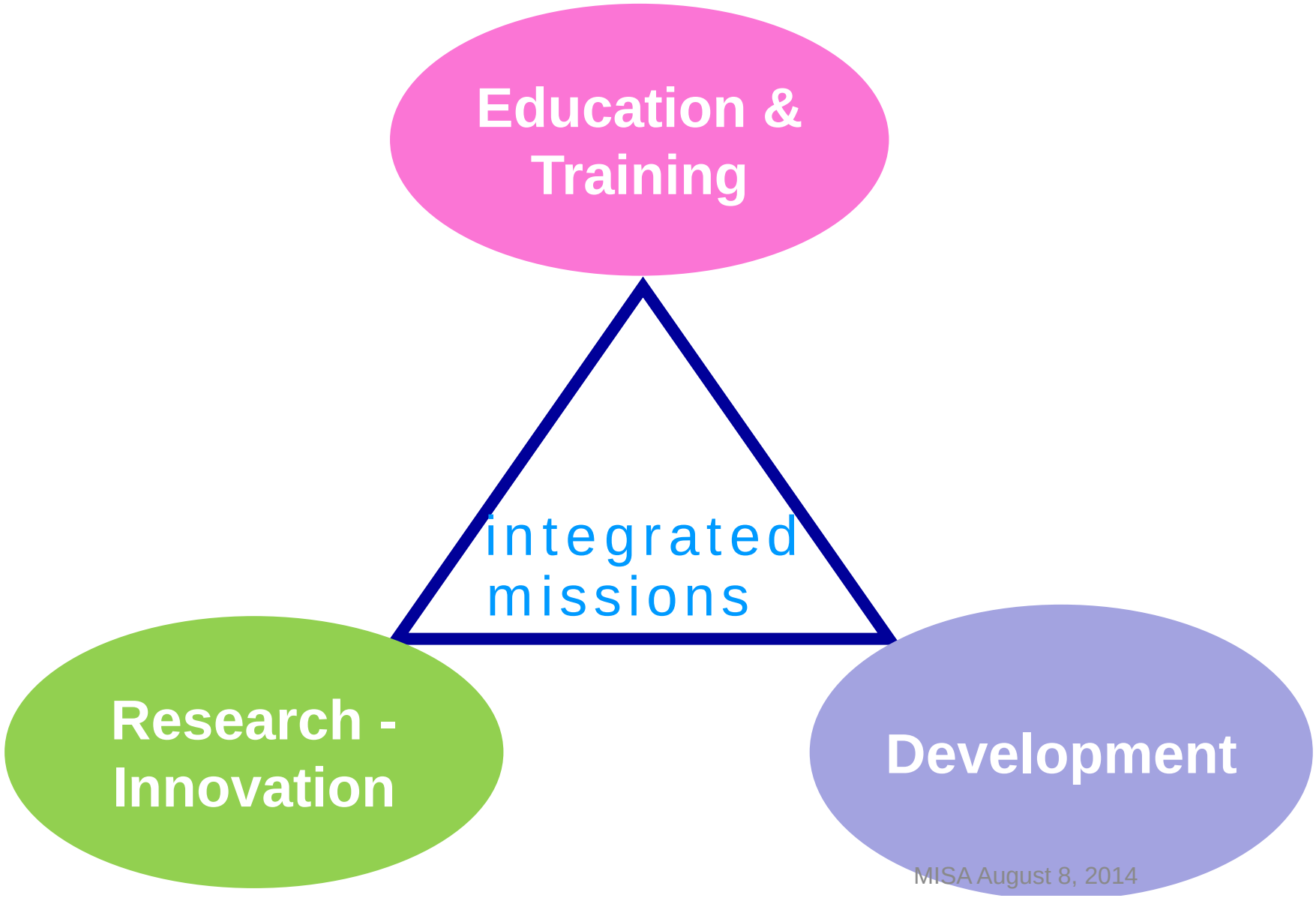
Hassan II Agronomy and Veterinary Institute (IAV)

Professional Interests & on going research programs

Possibilities and perspectives for development

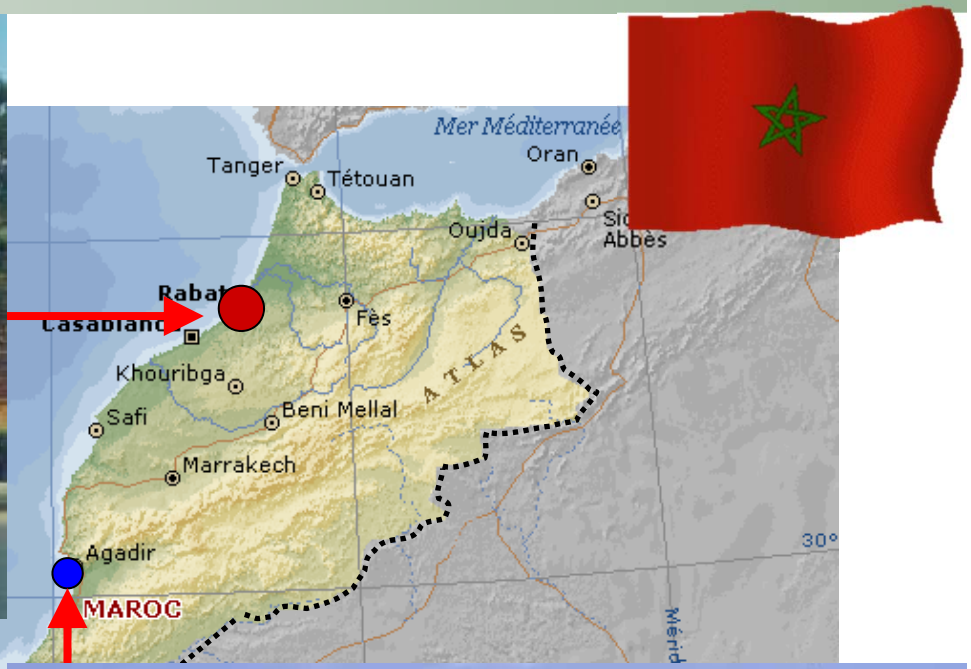
Hassan II Agronomy & Veterinary Institute Rabat, Morocco

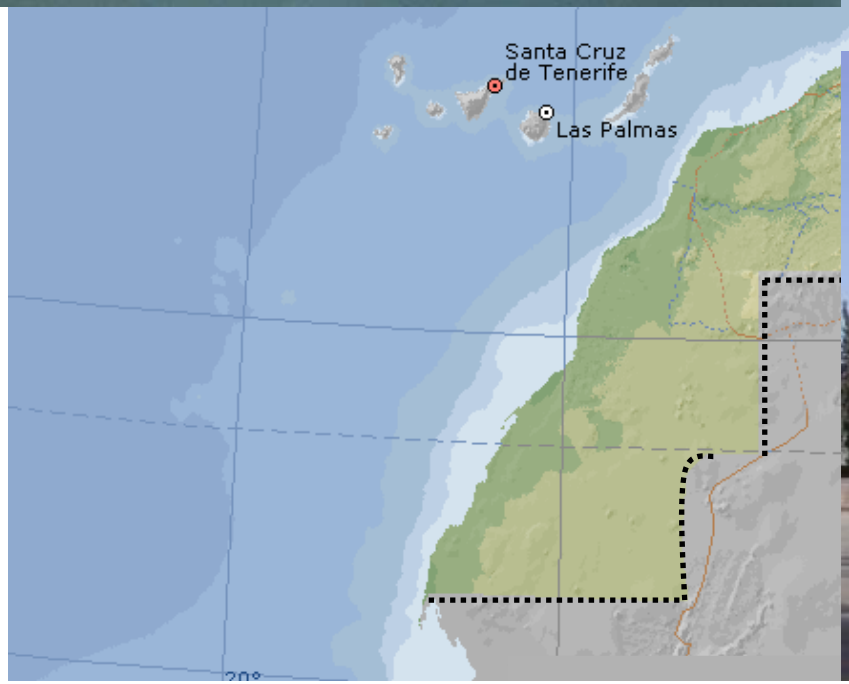
Missions


Education & Training
integrated missions
Research - Innovation
Development

2 Campuses


Campus de Rabat


Mer Méditerranée
Tanger
Tétouan
Oran
Oujda
Rabat
Casablanca
Fès
Khouribga
Safi
Beni Mellal
ATLAS
Marrakech
Agadir
MAROC
30°


Santa Cruz
de Tenerife
Las Palmas
20°


Campus d'Agadir

Six schools

Agronomy

Veterinary Medicine

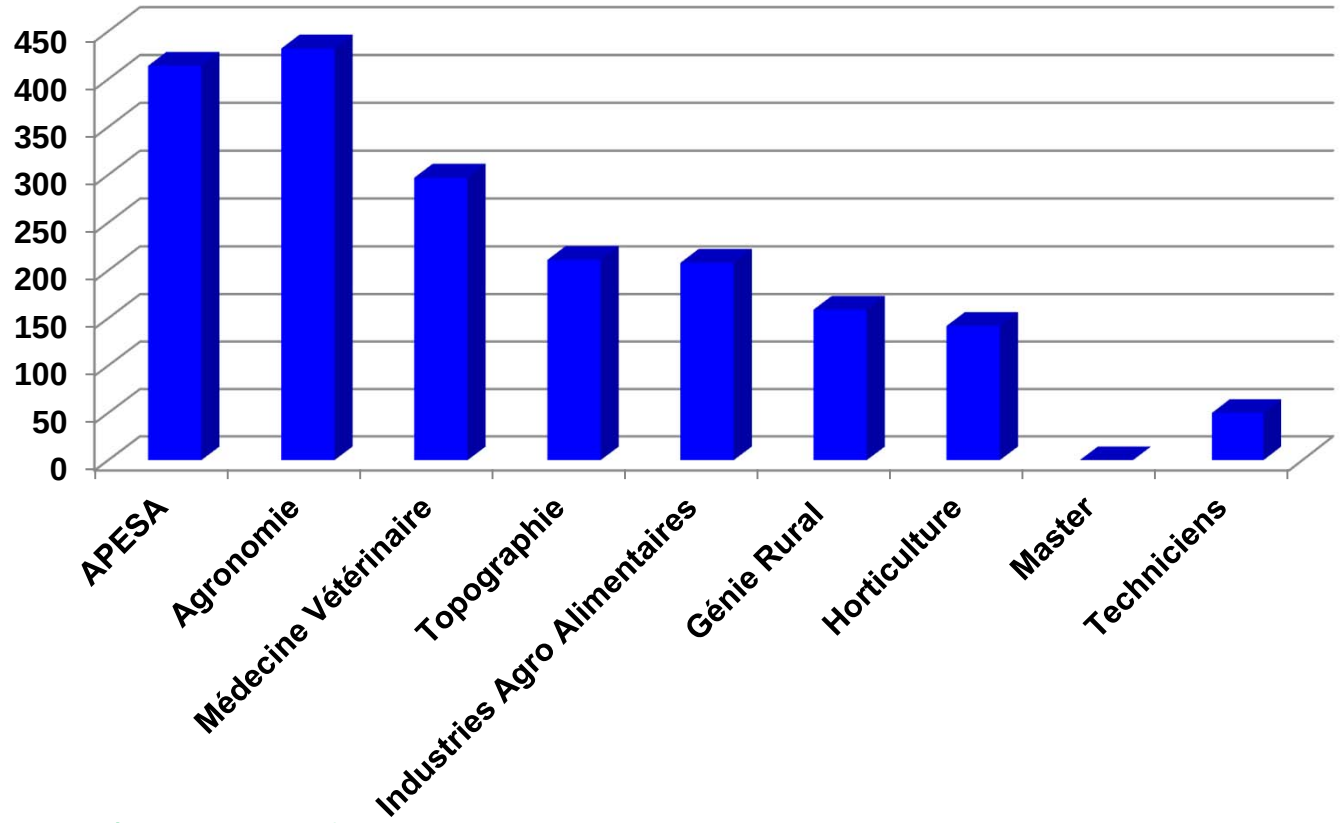
Topography

Food Sciences & Technologies

Ag engineering

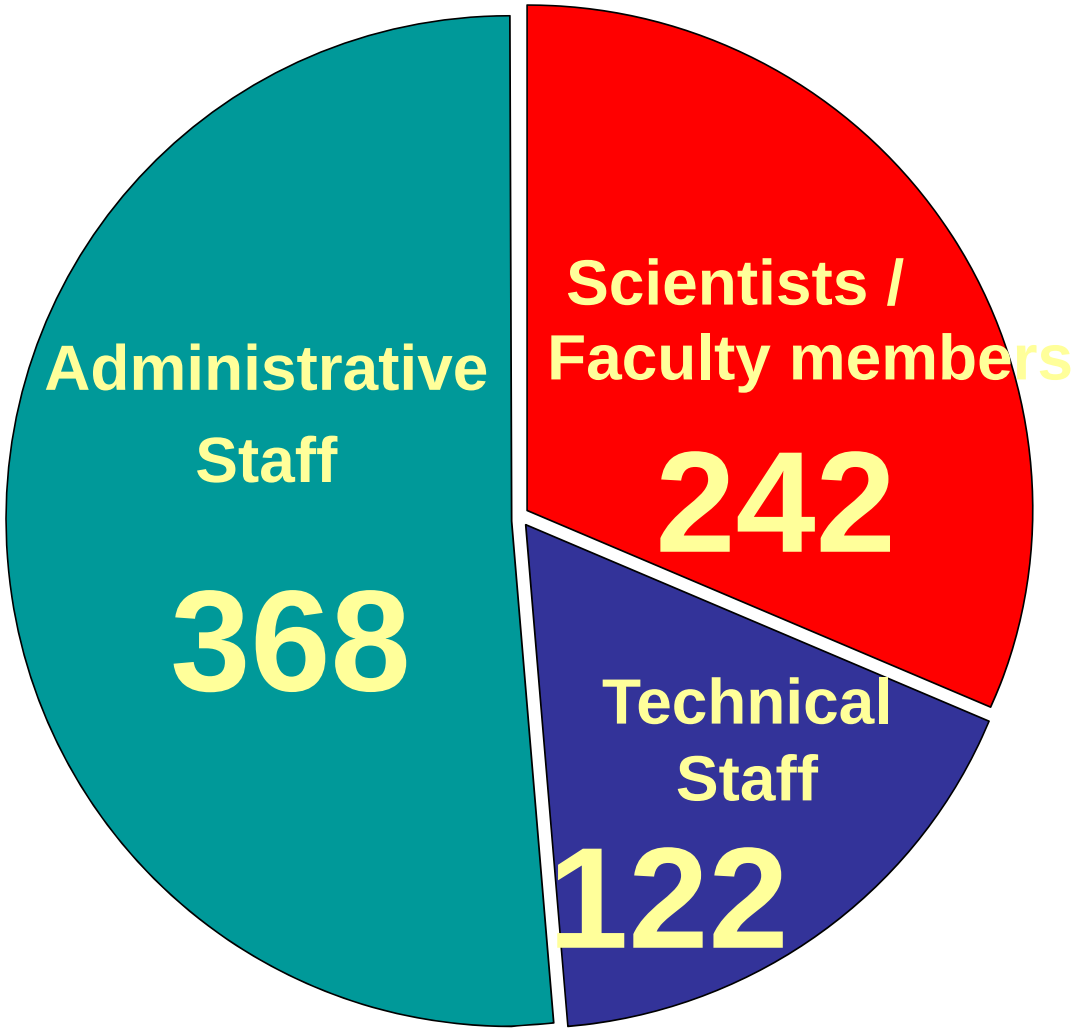
Horticulture

Students 2013-2014

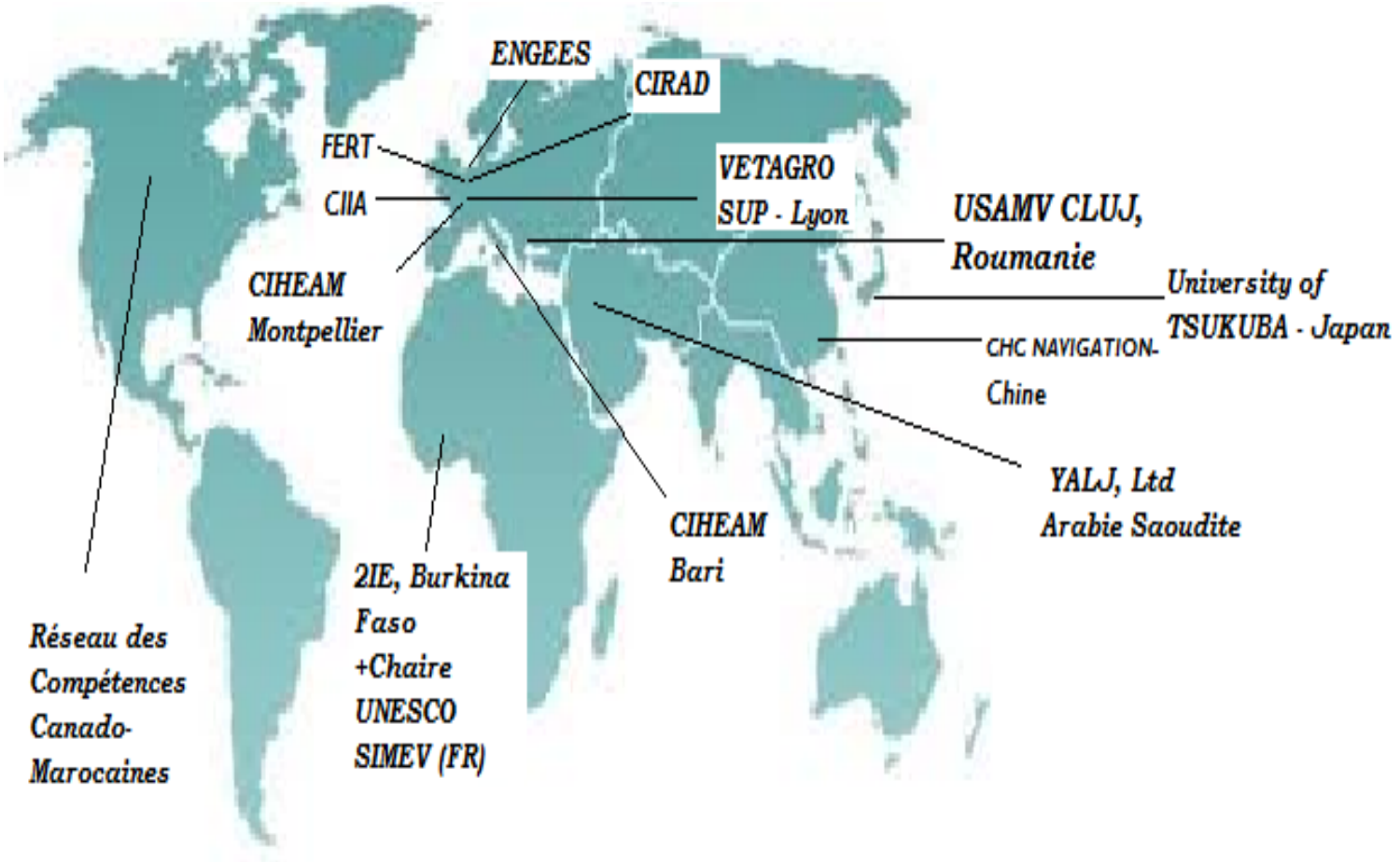


240 PhD Students

Human Resources



Cooperation



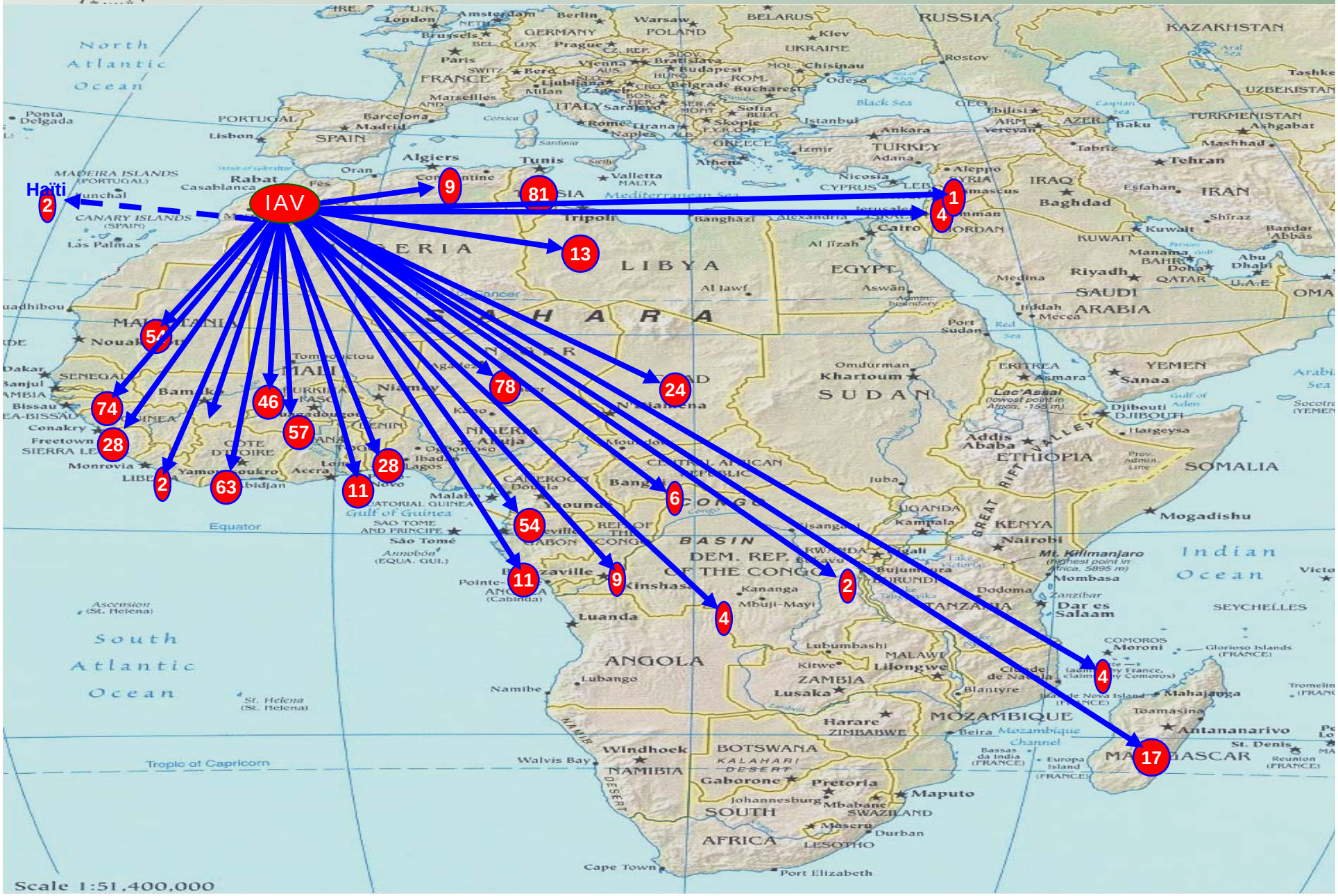
The Minnesota Project

a 20-year partnership between UMn and IAV (1970s - 1990s)

- Granted 132 doctorates and 250 master's degrees to Moroccan students;
- Trained Moroccan agronomists to solve rural development issues using scientific research.

  - ✓ developped technical and professional skills,
  - ✓ increased cross-cultural understanding, and
  - ✓ promoted tolerance and advanced cooperation.

International / African Network



PROFESSIONAL INTERESTS

- N metabolism, field crop nutrition and fertilization,
- Fertilizer Recommendation Programs for Farmers,
- Farming System Research and Development,
- Rural Development, &
- Gender & Development

Activities

Teaching
Training program : Engineering of Crop Production

- ✓ Cropping Practices
- ✓ Field crops
- ✓ Plant Nutrition
- ✓ Metabolisms and Regulations
- ✓ Scientific communication
- ✓ Quality assurance

Research

- ✓ Crop Nutrition laboratory
- ✓ Research unit : Soil fertility and crop Fertilization management

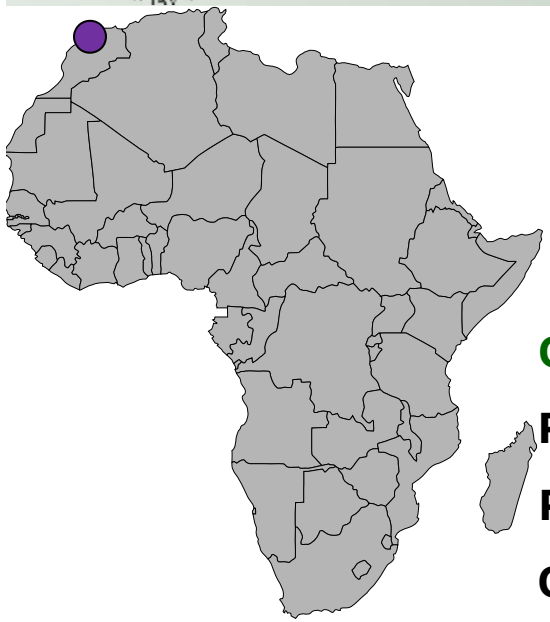
Research / Development

Soybean Research Program

- Large Development of animal production in Morocco,
- Improvement of forage crops stands out as a strategic necessity, and
- Local production of protein concentrates ensures some independence towards the external market

The need for the evaluation of soybean as a new forage crop

Experimental Protocol 2013



Mazaria (COPAG) / Larache

	FASTO	KLAXON
Groupe de maturité	**I**	**000**
Faculté germinative	100%	76%
PMG	173 g	172 g
Couleur des fleurs	Blanchâtres	Violettes
Pilosité	Verte	Fauve
Hile	Noire	Jaune (clair)
Productivité	**Très bon potentiel**	**Très productif**
Teneur en protéines	**40.4**	**41.8**
Résistance à la verse	Bonne tenue à la verse	Intermédiaire
Hauteur de végétation	102 cm	75 à 85 cm

Experimental Protocol 2013

N Treatment	Planting	Onset of flowering
	kg N/ha	
T0 (No inoculation)	0	0
T1	0	0
T2	40 (starter)	0
T3	0	80
T4	40	80

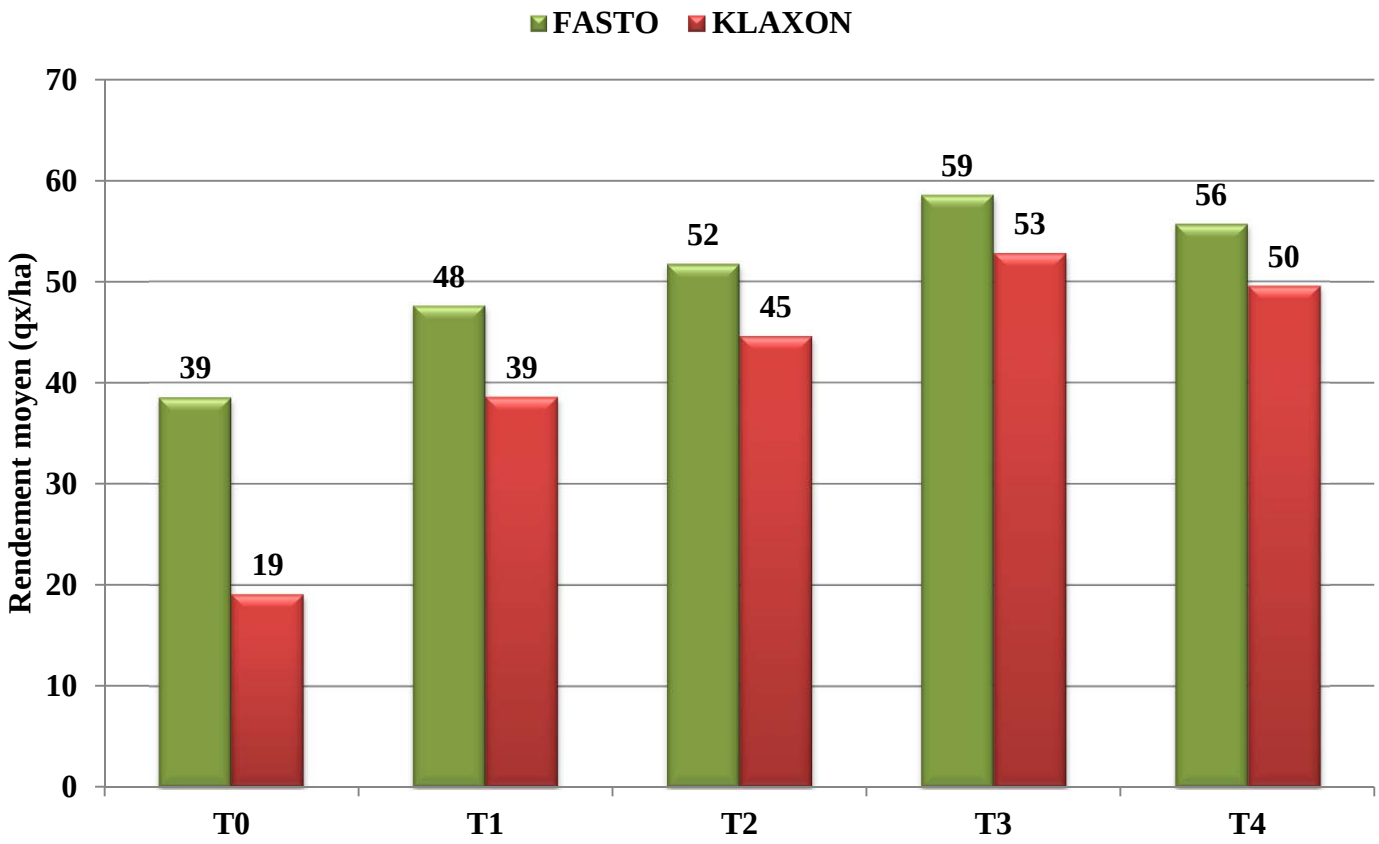
60 kg/ha P & 100 kg/ha K at planting

Experimental Protocol 2013

Experimental Design

T1	T3	T2	T4	T0	Bloc 1
T2	T0	T1	T3	T4	
T4 V1	T1 V1	T3 V1	T0 V1	T2 V1	Bloc 2
T2 V2	T3 V2	T0 V2	T4 V2	T1V2	
T0 V1	T2 V1	T4 V1	T1 V1	T3 V1	Bloc 3
T3 V2	T1 V2	T0 V2	T2 V2	T4 V2	

Results



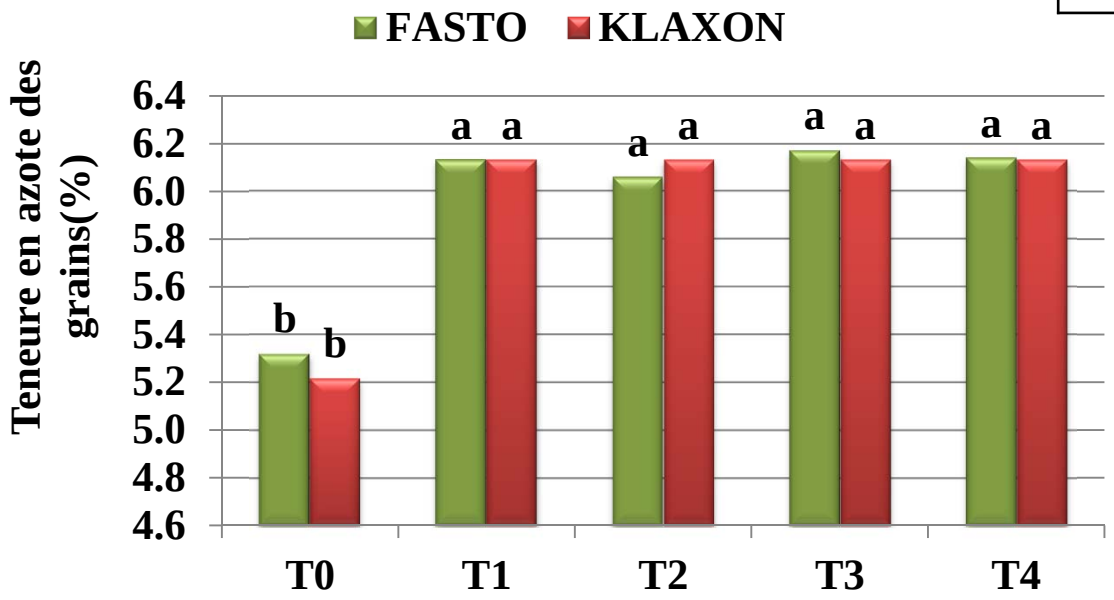
Effect of N treatments on soybean yield for the 2 varieties

Soybean N Assimilation

Traitement	N(%)		Total N (kg/ha)	
	FASTO	KLAXON	FASTO	KLAXON
T0	1.0 (a)	1.1 (a)	231.5 (c)	108.7 (c')
T1	1.2 (a)	0.9 (a)	322.5 (b)	231.3 (b')
T2	1.2 (a)	1.0 (a)	405.3 (a)	316.1 (a')
T3	1.1 (a)	1.0 (a)	444.0 (a)	345.1 (a')
T4	1.2 (a)	1.0 (a)	403.0 (a)	321.8 (a')
Moyenne	1.12	0.98	361.3	264.6

Soybean N Assimilation

	FASTO	KLAXON
NHI (%)	85	87
NRE (%)	82	63



Effect of N treatments on soybean grain N for the 2 varieties

Experimental Protocol 2014

	Maturity Group	Kernel weight (mg)	Productivity (kg/ha)	GPC (%)
Fasto	I	173.0	5900	40.4
Klaxon	0	172.0	5300	41.8
Jake	V	150.9	3600	41.4
Stoddart	IV	135.4	3400	40.7
Lambert	0	137.1		
Williams 82	III	157.3	3700	41.0
MPV4238	IV	176.5	3400	
MN1701CN	I	135.8	3800	
MN0907	0	163.8	3500	35.7
MN1410	I	179.0	4000	35.2

Experimental Protocol2014 / Variety trial

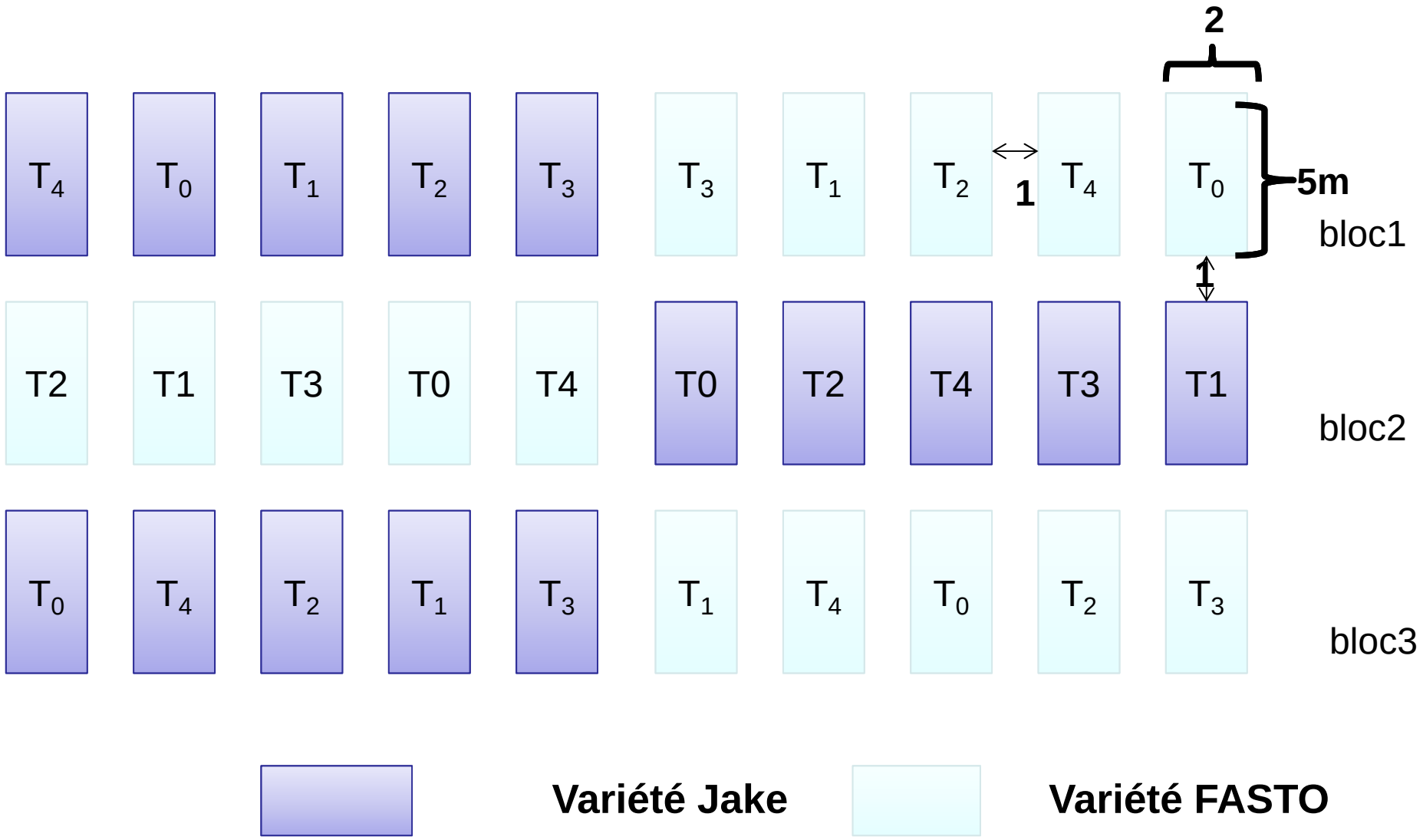
4m

MN0709	LAMBERT	WILLIAMS 82	MN1701 CN	MN 1410	STOD-DARD	KLAXON	NPV4238	FASTO
LAMBERT	WILLIAMS 82	MN1410	MN 0709	STOD-DARD	MN170 1CN	NPV 4238	KLAXON	FASTO
WILLIAMS 82	LAMBERT	MN0709	STOD-DARD	MN1701 CN	NPV 4238	MN 1410	KLAXON	FASTO

6m

3m

Experimental Protocol 2014 / N trial



Experimental Protocol 2014 / N trial

N Treatment	Planting	Onset of flowering
	kg N/ha	
Control (T0)	0	0
T1	0	40
T2	40	0
T3	40	40
T4	40	80

60 kg/ha P & 100 kg/ha K at planting

Soybean 2013

Planting

Soybean 2013

Fertilization

Soybean 2013

Irrigation

Gouteur autorégulant 1l/h

Soybean 2013

Phytosanitary treatments

Soybean 2013

Soybean 2014/ N trial

Soybean 2014 / Variety trial

Quinoa Research Program

Fertilization trial 2013

- Ain Sbit, Romani
- BAC avec 3 replications
- L11

N Treatment	Planting	Early active growth
	kg N /ha	
T1	0	0
T2	0	60
T3	60	0
T4	60	60
T5	60	120

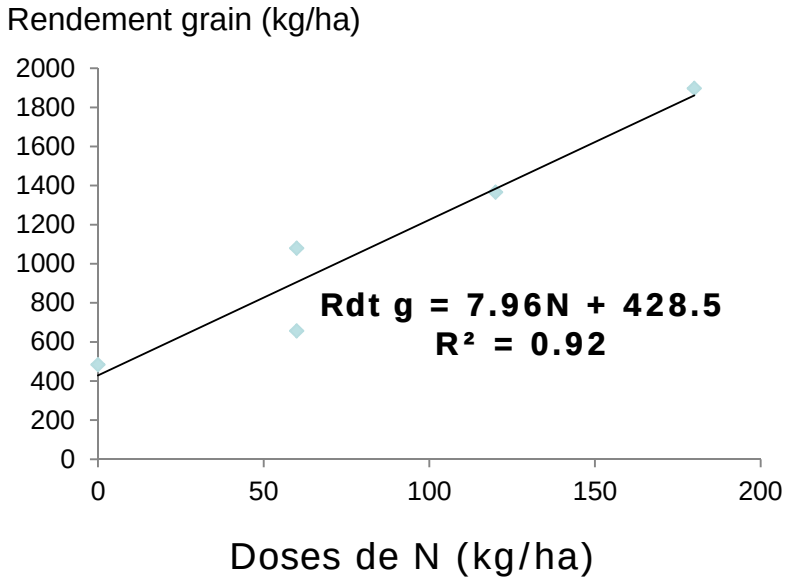
Grain yield

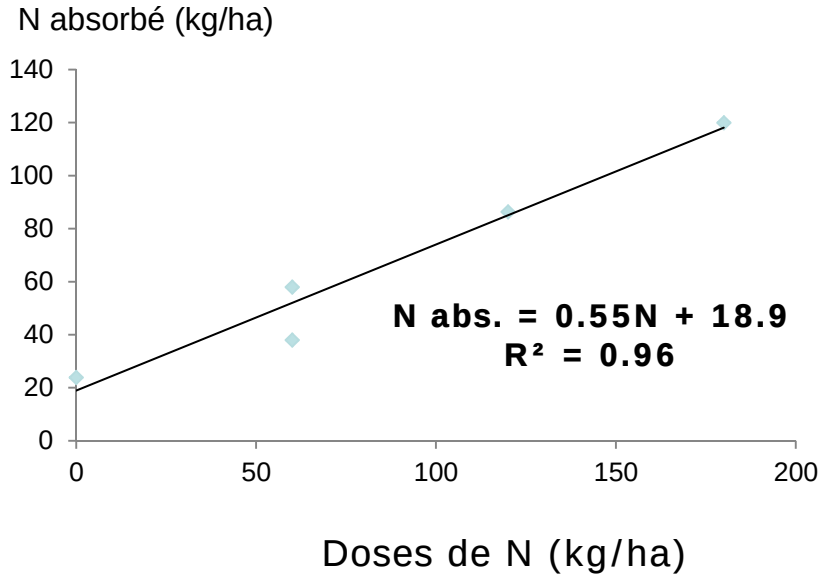
Treatment	Grain yield	TDM	HI (%)
	q/ha		
0 – 0	4.8	13.1	36.9
0 – 60	10.8	27.7	39.0
60 - 0	6.6	19.5	33.7
60 - 60	13.7	36.3	37.7
60 – 120	19.0	51.3	37.0
ANOVA	THS	THS	

N Assimilation

Treatment	N % Grains	GPC (%)	N total Kg/ha	NHI (%)	NUE Kg grain / kg N (uptake)
0 – 0	3.0	18.4	23.8	60.3	20.3
0 – 60	3.2	20.0	58.0	60.2	18.6
60 - 0	3.2	19.9	38.0	55.6	17.3
60 - 60	3.9	24.1	86.3	61.5	15.8
60 – 120	3.6	22.1	119.9	56.4	15.8
ANOVA			THS		

N – grain yield relationship





Quinoa Research Program

Fertilization trial 2014

- Berrechid
- BAC, 3 replications
- Titi & Puno

Irrigation

N Treatment / Irrigated trial	Early active Growth (kg N / ha)
T 0	0
T 60	60
T 120	120
T 180	180

Quinoa 2013

Quinoa 2014

Possibilities and perspectives for development

Research

Research topic	Involved persons from IAV
Soybean production	F. Mosseddaq D. El Hamri (PhD student)
Climate change	Y. Imani O. Lahlou
Water ressources	Y. Imani O. Lahlou
Soil & water conservation	M. Naimi

Research

Research topic	Involved persons from IAV
Gender approach / Integrated Water Resource Management	F. Mosseddaq
Gender approach / Local products / Ecotourism	F. Mosseddaq Y. Imani O. Lahlou
Share IAV experience in Social Sciences	I. Bounadi Ph D Candidate
Possibilities of sharing through eLearning	L. Moughli

Exchange of faculty and students

- PhD program: U of MN Faculty participate in student advising and sit on a review committee
- Ways for students to come both ways for a few months to work with their 'Advisor'
- MAST program

U of MN - IAV - African countries

- Significant population of students from African countries, and
- Several research / Development programs with African countries

IAV will provide strategic entree into many of the African countries

Exemples of on going research programs

Project	Frame work	Period	Partners	Involved persons from IAV
DEWFORA Drought Early Warning and Forecasting in Africa	FP7 EU	Jan 2011 Dec 2013	Deltares (Nederland) Consortium of 19 African & European Institutions	Pr Alaoui Bennaceur Dr Imani Yasmina Dr Lahlou Ouiam
GYGA Global Yield Gap Atlas for Middle East and North Africa	FABRI USAID	Jan 2014 Dec 2015	UNL (Nebraska) INRGREF (Tunisia) NCARE (Jordan) IAV (Morocco)	Pr Ouaattar Said Dr Imani Yasmina Dr Lahlou Ouiam
WEAP Participatory planning for Improving Water Use Efficiency at Basin Level	FABRI USAID	Jan 2014 July 2015	SEI (USA) INRGREF (Tunisia) NCARE (Jordan) CNRST (Morocco)	Pr Ouaattar Said Dr Imani Yasmina Dr Lahlou Ouiam

Exemples of on going research programs

Project	Partners	Involved persons from IAV
Agricultural Machinery use in Africa	JICA & a Consortium of 15 African Institutions	Pr E.H. Bourarach / Ag engeneering School
One Health Program	EU, North Africa Several African Countries	Veterinary School

Thank you

Fatema Mosseddaq,

Production, Protection et Biotechnologies Végétales

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