UNDER THE AUSPICES OF THE MINISTRY OF AGRICULTURE AND FISHERIES MOROCCO

Ministère de l'Agriculture et de la Pêche Maritime

2016 International Conference on PULSES

FOR HEALTH, NUTRITION AND SUSTAINABLE AGRICULTURE IN DRYLANDS

Marrakesh, Morocco, 18-20 April, 2016

CONFERENCE PROGRAM & ABSTRACT BOOK

ICARDA
Science for Better Livelihoods in Dry Areas

INRA

FONDATION OCP

IFAD
Investing in rural people

Food and Agriculture Organization of the United Nations

CGIAR RESEARCH PROGRAM ON Grain Legumes

INTERNATIONAL COMMITTEE

Dr. Mahmoud Solh (ICARDA), Chair
Prof. Mohamed Badraoui (INRA), Morocco
Dr. David Bergvinson (ICRISAT), India
Dr. Khalida Bouzar (IFAD), Near East and North Africa Region
Mr. Dost Muhammad (FAO), Regional Office for Near East
Mr. Nawfel Roudies (Fondation OCP), Morocco
Dr. Masum Burak (GDAR), Turkey
Dr. B.B. Singh (ICAR), India
Dr. Asnake Fikre (EIAR), Ethiopia
Dr. Fred Muehlbauer (USDA/ARS), USA
Dr. Doug Cook (UC-Davis), USA
Prof. Kadambot Siddique (University of Western Australia), Australia
Prof. Diego Rubiales (CSIC), Spain
Dr. Marie Hélène Jeuffroy (INRA), France
Dr. Michael Baum (ICARDA), Morocco
Dr. Shoba Sivasankar (ICRISAT), India
Dr. EL Gharous Mohamed, Mohamed VI Polytechnic University, Morocco
Dr. El Mejahed Khalil, Mohamed VI Polytechnic University, Morocco

LOCAL COMMITTEE

Dr. Rachid Dahan, INRA, Chair
Dr. Shiv Kumar Agrawal, ICARDA
Dr. Mohamed El Mourid, ICARDA
Dr. Rachid Mrabet, INRA
Dr. Mohamed El Asri, INRA
Ms. Nezha Mouchfi, INRA
Prof. Ahmed Bamouh, IAV- Hassan II
Dr. Hind Hamma, Fondation OCP
Mr. Rouini Imadeddine, Fondation OCP
Ms. Hassina Moukhariq, Fondation OCP
Dr. Ashutosh Sarker, ICARDA
Dr. Sripada M Udupa, ICARDA
Dr. Seid Ahmed Kemal, ICARDA
Dr. Ahmed Amri, ICARDA
Dr. Moustapha El-Bouhssini, ICARDA
Dr. Mohammed Karrou, ICARDA
Ms. Oumekaltoum Essahli, ICARDA

SCIENTIFIC PROGRAM COMMITTEE

Dr. Ahmed Amri, ICARDA
Dr. Mustapha El-Bouhssini, ICARDA
Dr. Seid Ahmed Kemal, ICARDA
Dr. Mohammed Karrou, ICARDA
Dr. Sripada M Udupa, ICARDA
Dr. Shiv Kumar Agrawal, ICARDA
Dr. Somanagouda B Patil, ICARDA

CONTENTS

AGENDA

Date/Time	Activity	Speaker
April 17, 2016		
17:00-19:00	*Evening registration*	
April 18, 2016		
08:00-08:50	*Registration*	
08:50-10:00	***Conference Opening Ceremony***	
08:50-09:30	*Welcome addresses*	- *Ministry of Agriculture and Fisheries, Morocco* - *FAO* - *Fondation OCP* - *IFAD* - *CRP-GL* - *BOT-ICARDA* - *ICARDA*
09:30-10:00	***KN01:*** *Soil Health and Environmental Management for Sustainable Agricultural Production Systems*	*Rattan Lal, The Ohio State University, USA*
10:00-10:30	***Coffee Break***	
10:30-12:00	***Session 1, Plenary: Global Pulses Scenario – Production, Consumption and Trade*** ***Chair: Périn Saint Ange, Associate Vice-President, IFAD*** ***Co-Chair: Andrew Jacobs, Director of AGT Foods, GPC***	
10:30-11:00	***KN02:*** *Global pulses consumption, production and trade scenario: Trends and Outlook*	*Pramod K Joshi, IFPRI*
11:00-11:30	***KN03:*** *Opportunities for enhancing pulses production to bridge demand-supply gap*	*Mahmoud Solh, ICARDA*
11:30-12:00	***KN04:*** *Status and prospects of pulses in Morocco*	*Nabil Chaouki, Ministry of Agriculture, Morocco*
12:00-13:30	***Panel discussion: Opportunities for bridging demand-supply gap in pulses***	*Representatives from Government, FAO, IFAD, CRP-GL, ICARDA, NARS leaders, private sector(GPC), farmers*
13:30-14:30	***Lunch***	
	CONCURRENT SESSIONS 2 & 3	
14:30 – 16:00	***Session 2: Pulses – Global Health, Nutrition and Gender*** ***Chair: Riccardo Del Castello, Communication for Development officer, FAO*** ***Co-Chair: Nawfel Roudies, Director, ADP, Fondation OCP***	
14:30-15:00	***KN05:*** *Potential of pulses in the context of global health challenges*	*Dilrukhi Thavarajah, Clemson University, USA*
15:00-15:15	***OP01:*** *Alleviating micronutrient deficiency through iron fortification of lentil dal*	*Rajib Podder, University of Saskatchewan , Canada*
15:15-15:30	***OP02:*** *Lupins – a protein crop able to perform in drylands*	*Federico Andreotti, Wageningen University Netherlands*
15:30-15:45	***OP03:*** *Lentil - A dietary solution to Arsenic poisoning in Bangladesh*	*Judit E.G. Smits, University of Calgary, Canada*
15:45-16:00	***OP04:*** *The role of women and the youth in pulses value chains*	*Esther Mwihaki Njuguna, CRP-GL, Kenya*

14:30-16:00	***Session 3: Innovations in Pulses Genomics*** ***Chair: Fred Muehlbauer, Research Geneticist, WSU*** ***Co-Chair: Michael Baum, Director, BIGM, ICARDA***	
14:30-15:00	***KN06:*** *Pulse genomics comes of age*	*Rajeev K Varshney, ICRISAT*
15:00-15:15	***OP05:*** *A role for genetics in the era of vast sequence datasets*	*Noel Ellis, New Zealand*
15:15-15:30	***OP06:*** *The lentil genome – from the sequencer to the field*	*Kirstin Bett, University of Saskatchewan, Canada*
15:30-15:45	***OP07:*** *Genome-wide SNP identification, linkage map construction and QTL mapping of mineral nutrients in pea*	*Rebecca McGee, USDA, USA*
15:45-16:00	***OP08:*** *Deploying genome sequence information for pigeonpea improvement*	*Rachit K Saxena, ICRISAT*
16:00-16:30	***Coffee break and Poster Session***	
	CONCURRENT SESSIONS 4 & 5	
16:30-18:00	***Session 4: Pulses and Natural Resource Management*** ***Chair: Andrew Noble, Deputy Director General (Research), ICARDA*** ***Co-Chair: Abdallah Aboudrar, ENA-Meknes***	
16:30-17:00	***KN07:*** *The next step to increase legume nitrogen fixation: Host plant improvement*	*Thomas R Sinclair, NCSU, USA*
17:00-17:15	***OP09:*** *A plus for pulses: symbiotic nitrogen fixation for sustainable intensification in the drylands*	*Rachid Serraj, CGIAR-ISPC, Italy*
17:15-17:30	***OP10:*** *Soil health, the missing link in sustainable pulses production*	*Ashok K Patra, ICAR-IISS, India*
17:30-17:45	***OP11:*** *Interaction of nitrogen fixation and water use efficiency in chickpeas*	*Carola Blessing, University of Sydney, Australia*
17:45-18:00	***OP12:*** *Phenotypic and genotypic diversity for tolerance to environmental stresses in Rhizobia nodulating lentil and chickpea in Morocco*	*Imane Thami-Alami, INRA, Morocco*
16:30-18:00	***Session 5: Pulses Genetic Resources: Conservation and Utilization*** ***Chair: Shoba Sivasankar, Director, CRP Grain Legumes*** ***Co-Chair: Janny van Beem, GCDT***	
16:30-17:00	***KN08****: Plant genetic resources for climate resilient crop cultivars for food and nutrition*	*Hari D Upadhyaya, ICRISAT*
17:00-17:15	***OP13****: Approaches for efficient conservation and mining of temperate pulses genetic resources*	*Ahmed Amri, ICARDA*
17:15-17:30	***OP14****: Walking on the wild side – expanding genetic diversity for future lentil breeding*	*Bert Vandenberg, University of Saskatchewan, Canada*
17:30-17:45	***OP15****: Mining natural genetic variation from old and new germplasm collections for chickpea breeding*	*R Varma Penmetsa, UC-Davis, USA*
17:45-18:00	***OP16****: Molecular approach for studying genetic diversity and population genetic structure of Asiatic Vigna accessions*	*Aditya Pratap, IIPR, India*
20:00-22:30	***Gala dinner***	

April 19, 2016		
08:30-11:00	***Side Event: Practical Issues in Pulses Production and Marketing in Morocco Organizer: Moroccan Society of Agronomy and Horticulture (SMAHo)***	
08:30-11:00	***Session 6, Plenary: Opportunities for Enhancing Pulses Production Chair: Mahmoud Solh, Director General, ICARDA Co-Chair: Rachid Dahan, Secretary General, INRA***	
08:30-09:00	***KN09:*** *Opportunities and limitations of multidimensional crop improvement in grain legumes to support increased productivity in mixed crop livestock systems*	*Michael Blummel, ILRI*
09:00-09:15	***OP17:*** *Rice fallow – an opportunity for horizontal expansion of pulses*	*Masood Ali, ICAR, India*
09:15-09:30	***OP18:*** *Varietal and seed use of faba bean in Ethiopia: implication for the national seed system*	*Dawit Alemu, EIAR, Ethiopia*
09:30-09:45	***OP19:*** *Increased adoption of modern technologies and competiveness of legumes value chain players through the Private Public Partnership*	*Mphatso Dakamau, AICC, Malawi*
09:45-10:00	***OP20****: Plant-pollinator inter-play in pulses in the context of ecosystem health*	*María José Suso, CSIC, Spain*
10:00-10:15	***OP21****: Ensuring seed security and production of rainfed pulses in semi-arid tropics*	*Ch Ravinder Reddy, MSSRF, India*
10:15-10:30	***OP22****: Pulses suitability assessment for sustainable productivity of drylands of Morocco*	*Rachid Moussadek, INRA, Morocco*
10:30-10:45	***OP23****: Adoption and impact of improved legume varieties in rotation on cereal yield, household income and food self-sufficiency in the Ethiopian highlands*	*Solomon Tiruneh, AARI, Ethiopia*
10:45-11:00	***OP24:*** *Spatial big data analytics for intensification of pulses*	*Chandrasekhar Biradar, ICARDA*
10:30-11:00	***Linking FAO event on Soils & Pulses (Rome) and ICARDA/IFAD event on Pulses (Marrakesh)***	***Eleonora Lago (IFAD) & Mahmoud Solh (ICARDA)***
11:00-11:30	***Coffee break***	
	CONCURRENT SESSIONS 7 & 8	
11:30-13:00	***Session 7: Innovation in Pulses Breeding Chair: Bert Vandenberg, Professor, University of Saskatchewan Co-Chair: Clare Coyne, Research Geneticist, USDA***	
11:30-12:00	***KN10:*** *Enhancing genetic gains through innovations in breeding approaches*	*William Erskine, University of Western Australia, Australia*
12:00-12:15	***OP25****: Transgenics – a way forward for managing key stresses in pulses*	*NP Singh, IIPR, India*
12:15-12:30	***OP26:*** *Exploitation of heterosis for a major breakthrough in pulses*	*CV Sameer Kumar, ICRISAT*
Á12:30-12:45	***OP27:*** *Breeding pulses for nutritional quality with emphasis on bio-fortification*	*Ashutosh Sarker, ICARDA*
12:45-13:00	***OP28:*** *Association mapping for flowering time in lentil*	*Jitendra Kumar, IIPR, India*

11:30-13:00	***Session 8: Innovation in Productivity Management*** ***Chair: Mohamed Badraoui, Director General, INRA*** ***Co-Chair: Masood Ali, Formerly Director, IIPR***	
11:30-12:00	***KN11:*** *Innovations in productivity management of pulses*	*KHM Siddique, University of Western Australia, Australia*
12:00-12:15	***OP29****: Exploring management options to increase pulses production by using simulation models*	*Hélène Marrou, SupAgro, France*
12:15-12:30	***OP30****: Integration of pulses for a more productive cereal systems with lower environmental footprints*	*Yashpal Singh Saharawat, ICARDA*
12:30-12:45	***OP31****: Innovation platform approach and agricultural food legumes value-chain improvement in Morocco*	*El Houssine El Mzouri, INRA-Morocco*
12:45-13:00	***OP32****: Innovative techniques for pulses improvement and adoption of newer technologies with reference to climate change*	*Om Gupta, JNKVV, India*
13:00-14:00	***Lunch time***	
	CONCURRENT SESSIONS 9 & 10	
14:00-15:30	***Session 9: Innovation in Abiotic Stress Management*** ***Chair: Prof. KHM Siddique, Director, Institute of Agriculture, UWA*** ***Co-Chair: Prof. Ahmed Bamouh, Professor, IAV-Hassan II***	
14:00-14:30	***KN12:*** *Impact of high temperature stress on pulses*	*PV Vara Prasad, KSU, USA*
14:30-14:45	***OP33****: Dissecting water saving traits in pulses: efforts and future trends*	*Michel Ghanem, ICARDA*
14:45-15:00	***OP34****: Faba bean improvement towards drought stress through the exploitation of genetic diversity*	*Lamiae Ghaouti, IAV Hassan II*
15:00-15:15	***OP35****: Combined effect of drought and heat stresses is more profound than their standalone effects in chickpea*	*Srinivasan Samineni, ICRISAT*
15:15-15:30	***OP36:*** *Pigeon pea success story in Eastern and Southern Africa: achievements and prospects*	*Ganga Rao NVPR, Kenya*
14:00-15:30	***Session 10: Innovation in Biotic Stress Management*** ***Chair: Rebecca McGee, Research Geneticist, USDA, USA*** ***Co-Chair: Seid K Ahmad, Legumes Pathologist, ICARDA***	
14:00-14:30	***KN13:*** *Integrated management of parasitic weeds to reclaim pulses area in Mediterranean region*	*Diego Rubiales, CSIC, Spain*
14:30-14:45	***OP37****: Management of soil-borne diseases for sustainable pulses production*	*Weidong Chen, USDA, USA*
14:45-15:00	***OP38****: Integrated pest management of food legume insect pests in North Africa, West and Central Asia*	*Mustapha El-Bouhssini, ICARDA*
15:00-15:15	***OP39****: Foliar diseases in food and forage legumes*	*Eva Madrid, Max Planck Institute, Germany*
15:15-15:30	***OP40****: Combating wilt susceptibility in chickpea – a success story and challenges ahead*	*Deep Ratna Saxena, RVSKVV, India*
15:30-16:00	***Coffee break and Poster session***	

16:00-19:00	***FAO Side Event: International Year of Pulses, Regional Dialogue for Africa*** ***Riccardo Del Castello, FAO*** ***Contd….. on April 20, 2016***	
16:00-18:00	***Panel Discussion: ICARDA Research Strategy***	***Kamel Shideed, ICARDA***
20:00-22:00	***Dinner***	
April 20, 2016		
08:30-13:00	***Session 11: Toward Sustainable Food Production Systems in Drylands*** ***Chair: Kamel Shideed, Assistant Director General (IC), ICARDA*** ***Co-chair: Mohamed El Gharous, PM6P***	
08.30-8.40	*Introduction*	*Kamel Shideed, ICARDA*
08:40-10:00	***A: Knowledge Sharing – Country Successes, Lessons Learnt & Challenges Ahead*** *(7 minute lightening presentations by country NARS and project leads)*	
08:40-09:25	*India-Morocco Food Legumes Initiative*	*SA Patil, Advisor, Fondation OCP, India*
	Morocco	*Dahan Rachid, INRA*
	India	*Ch Ravinder Reddy, MSSRF*
	Bangladesh	*Mohd Omar Ali, BARI*
	Nepal	*Yam Pandey, NARC*
09:25-10 :00	*Strengthening Wheat-Legumes Systems in West Asia & North Africa*	
	Egypt	*Mohamed Solomon, FCRI*
	Sudan	*Gamal Elkheir Khalifa Ismaeel, ARC*
	Tunisia	*Mohamed Salah Gharbi, INRAT*
	Morocco	*Hamida Hilali, INRA*
	Ethiopia	*Asnake Fikre, EIAR*
10:00-10:30	***Coffee break***	
10:30-12:00	***B. Achieving Diversification & Sustainable Intensification of Cereal Based Systems with Pulses***	
10:30-11:30	*Thematic Roundtables: Facilitated by Andrea Gros and Rajita Majumdar, ICARDA*	
11:30-11:50	*Presentation on roundtable outcomes*	
12:00-13:00	***Joining Hands on a Practical Path Forward: Science, Policy, Institutions & Markets*** ***Chair: Philippe Ellul, CGIAR Consortium***	
12:00-12:20	*Call for votes and recommendations*	
12:20-12:30	*Concluding Remarks*	*Philippe Ellul, CGIAR Consortium*
12:30-13:00	*Media Q&A/Open floor*	
	Vote of Thanks	
13:00-14:00	***Lunch***	


good for planet, good for people
2016
International
Conference on
PULSES
FOR HEALTH, NUTRITION AND
SUSTAINABLE AGRICULTURE
IN DRYLANDS

Theme 7
Country successes, lessons learnt and challenges (knowledge sharing event)

PP174: Agroforestry systems in Morocco, grain legumes and olive trees in Saïs region: Moulay Driss Zerhoun case study

Asmae Amassaghrou[1*], Ahmed Bouaziz[1], Rachid Razouk[3], Mohamed Karrou[2], Karim Barkaoui[3], and Khalid Daoui[3]

[1]Institut Agronomique et Vétérinaire Hassan II, Rabat, Morocco; [2]International Center of Agricultural Research in the Dry Areas, Rabat, Morocco; [3]Institut National de Recherché en Agronomie (INRA), Morocco.
*(amassaghrou.asmae@gmail.com)

Agroforestry systems based on grain legumes such as faba bean, chickpea and lentil are expected to benefit the production of olive while improving the soil fertility, because legumes have the ability to fix atmospheric nitrogen (N) symbiotically. In Morocco, intercropping of legumes and olive trees has a long tradition in oasis and mountains areas, where land resources, soil fertility and water are scarce; but this system has received a little research attention aiming at the assessment and improvement of its performance in the context of climate change, more drought and land degradation. The main objectives of this work were: i) to determine the importance of agroforestry systems in Saïs region, Morocco, ii) to identify the main reasons and farmers motivations underlying these association types, iii) to catch local knowledge and iv) finally to better understand the role of legumes in the system. In the first step, socio-economic and technical data were collected from 45 households-farms randomly chosen in Moulay Driss Zerhoun area. The information collected was used to analyze determinants of intercropping legume use intensity. Since the species grown between olive trees are mainly legumes and forages, the surveyed farmers believe that these crops do not affect the olive trees production because they do not compete too much with a tree for water and nutrients, because legumes provide nitrogen to the olive trees. The survey showed also that farming techniques of intercropping legumes with trees are not well mastered by farmers. In fact, the farmers do not take into account the whole system (crop and trees) when managing their fields, especially when they supply fertilizers. In our sample, organic fertilization is the most practiced in the area, 76% of the farmers apply different amounts of organic manure which ranged from 25 to 40 Kg/tree; on intercropping plots and the rest 24 % of farmers bring mineral fertilizers for legumes and olive trees. Grain yield is not interesting compared to the potential of the area; in intercropping grain yield of faba-bean is 0.5 ton/ha while in monoculture it can reach 1.5 ton/ha, chickpea 0.3 ton/ha and lentil 0.5 ton/ha. Studies demonstrated also that, mixed crops are generally more productive and ensure higher economic net return than monoculture. However the selection of appropriate legume species and the development of targeted and innovative agronomic practices are important to improve more the system efficiency and maximize the ecosystem services.

PP175: Determinants of farmers' decision on utilizing cereal and legume residue as feed and soil mulch in the Ethiopian highlands

Ashraf Alkhtib*, Jane Wamatu, Girma Kassie and Barbara Rischkowsky

International Center of Agricultural Research in the Dry Areas (ICARDA), Addis Ababa, Ethiopia.
*(a.alkhtib@cgiar.org)

Crop residues (CR) are dual purpose resources in mixed crop-livestock systems of the Ethiopian highlands. They serve as animal feed, income sources and inputs for soil and water conservation. However, multiple uses are two competing functions. Characterization of the determinants of use

intensity of cereal crop residue (CCR) and legume crop residue (LCR) help in designing strategies for more efficient utilization. Data on CR utilization were collected from 160 households in two highland regions in Ethiopia using a structured questionnaire and were analyzed using multivariate Tobit model. The results showed that farmers prefer using LCR to CCR for feed. The proportion of LCR used as feed was increased by education level of the farmer, livestock extension service, density of small ruminants and CR production from the previous season. Distance of farm plots from residences of the farm households decreased the use of CCR and LCR as feed. The use of LCR as feed increased when women participated in decision making on CR utilization. The proportion of LCR and CCR used for mulch was positively affected by the education of the farmer, the distance between the homestead and the cultivated land, extension service, awareness about mulch, the slope of cultivated land, farmer-to-farmer extension and CR produced in the preceding season. Better utilization of CR could be achieved by maximizing the use of LCR as feed and optimizing the use of CCR as mulch. Increasing the awareness among farmers about the use of CCR as mulch and the superiority of the LCR over CCR as feed could optimize the utilization of CR in the household. That could be achieved by conducting on-farm trials which show the difference in feeding value between CCR and LCR, livestock and crop extension provision, and encouraging informal social networks. More livestock extension on the feeding value of LCR should be provided to the farmers who cultivate sloppy plots. Encouraging the culture of labor exchange among the farmers could result in increased labor availability on the farms. This would facilitate the transport and storage of LCR and increase its use as feed.

PP176: Food legume crop in Algeria, situation and prospect: A case of lentil

Gaad Djouher

National Institute for Agriculture, Algeria. *(gaad_djouher@yahoo.fr)

Food legumes play an important and diverse role in the farming systems and in the diets of poor people around the world. In Algeria, among pulses, lentil (*Lens culinaris* Medik.) is one of the most important grain legume consumed by the population. It is grown mainly in semi-arid environment (Tiaret, Sidi Belabbas and Setif governorates) under rainfed conditions. The production of lentil crops lags far behind faba bean and chickpea, with an average cultivated area of 6458 ha. The increasing world interest in pulse has stimulated the need to document what is known about lentil in Algeria. This paper provides a review of current state of lentil production in Algeria.

PP177: Innovation platforms: A novel tool for improving food legume productivity and farmer's livelihood, and enhancing food security in Morocco

Lhaloui[1, 2], El Aissaoui[1], Bencheqroun[1], Boughlala[1], Houasli[1], Dahan[1], El Bouhssini[2], and El Miziani[2]

[1]Institut National de Recherche Agronomique (INRA), Morocco; [2]International Center for Agricultural Research in the Dry Areas (ICARDA), Rabat, Morocco. *(slhaloui@yahoo.com)

Food legumes (Faba bean, lentils, chickpea and pea) are important crops that come in rotation with cereals in the rainfed regions of Morocco where the cereal/food legume cropping system predominates. While these crops were very abundant in the seventies when Morocco was an exporter of these commodities, presently, the productivity is very low, and the country is obliged to supplement the deficit in its needs via increasing imports. The main focus of the present study, which is conducted within the India-Morocco Food Legume Initiative, was to initiate innovation platforms (PI's) for the different food legume species. The objective of these PI's is to bring together efforts and contributions of all stakeholders (farmers, decision makers, input companies, dealers etc.) in order to diagnose and resolve