Role of International organizations in the training of high skilled national specialists in PGR fields

Sevda Babayeva, Mehraj Abbasov

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Collaboration between AGRI and ICARDA 2003-2013

- The establishment of Biotechnology laboratory
- Capacity development on PGR fields
  - Short-term training courses on biotechnology, virology, breeding, database, GIS etc.
  - Individual degree, Ph.D.
- Joint projects and researches

Establishment of Biotechnology laboratory at AGRI

ICARDA, CIMMYT, FAO

Establishment of Biotechnology laboratory at AGRI

Capacity development

(training courses)

Theme of training (workshop)	Number of trainings	Number of participants	Countries
Database and genebank management	**10**	**15** (2 as an assistant of trainer)	Syria, Uzbekistan, Georgia, IRAN
Evaluation and characterization of PGR	**2**	**2**	Syria
Wheat prebreeding	**4**	**4**	Syria,
Wheat breeding	**3**	**3**	Uzbekistan
Biotechnology	**3**	**5**	Syria, Hungary
Plant virology	**1**	**1**	Syria
Total	**23**	**30**	

Afig Mammadov and Jan Konopka as trainers in seminars

Training course on seedling assessment of resistance to wheat rusts at ICARDA, 1-10 December 2009. Participants are practicing seedling note taking.

Training course on molecular marker technology at ICARDA, 15 November-15 December, 2006

Molecular analysis of Azerbaijan wheat collection with SSR markers, 2011

Training courses on breeding of winter wheat in Uzbekistan, 22 april-5 may 2013.

Capacity development

(training courses at AGRI)

A short-term training course on "**DNA marker applications for crop improvement and biotechnology tools in PGR utilization**" was organized by ICARDA, FAO, CIMMYT and AGRI during 25-30 April, 2011 at GRI.


An Introduction to
Marker technology
ICARDA

Capacity development

(training courses at AGRI)

Another training course was held at GRI on “Application of modern conventional tools in plant genetic resources characterization, pre-breeding and breeding” during 17-21 June, 2011 by Dr Ram Sharma and attracted ~20 researchers from different organizations dealing with PGR.

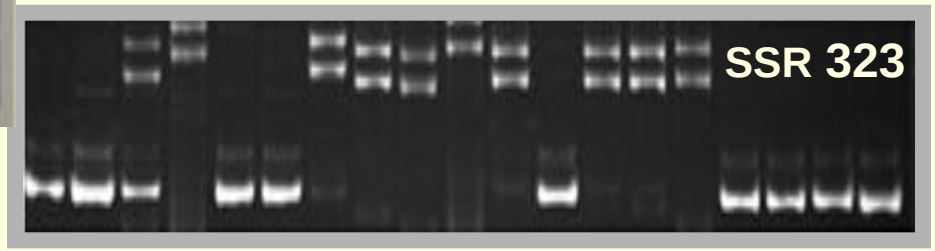
Capacity development

(PhD theses)

Dr. Zeynal Akparov from AGRI and Dr. **Kenneth Street** from ICARDA

Study of genetic diversity among lentil (*Lens culinaris* sps. *culinaris* Medik.) germplasm collection of Central Asia and Caucasian origin

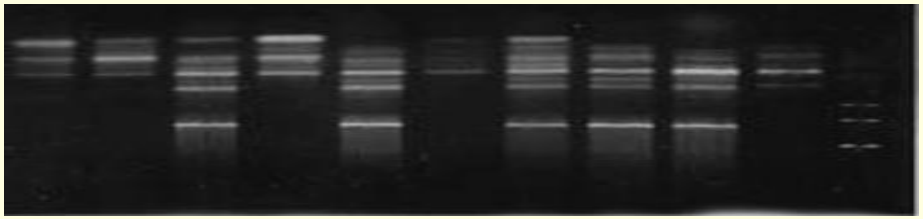
The investigation represented in PhD thesis was a pioneer work in Azerbaijan held with SSR markers and was partially financed by ICARDA. The genetic relationship based on similarity degrees showed a clear linkage between genetic relations among accessions and their geographical regions of origin. Results of the investigation were published in ISSI peer-reviewed journal (Genet Resources and Crop Evol, Springer). This constitutes the first manuscript from an Azerbaijan scientist, published in such peer-reviewed journal.



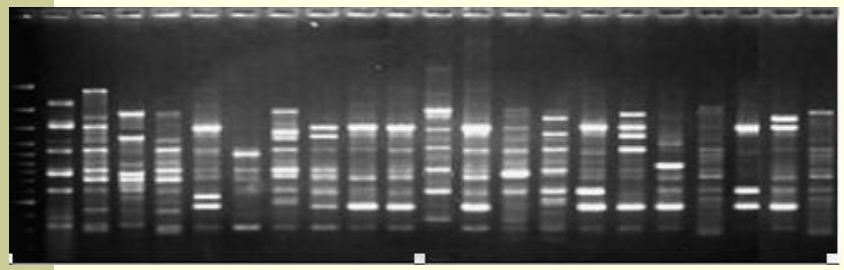
Capacity development

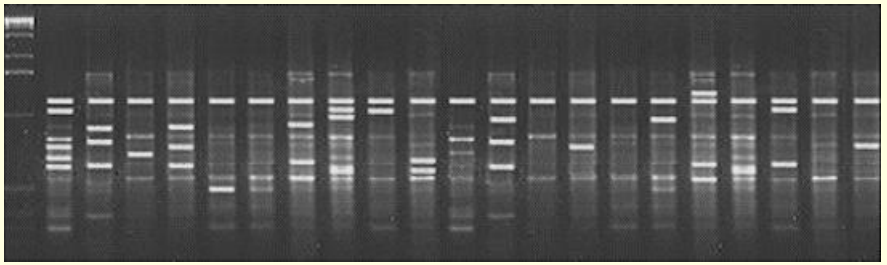
(PhD theses)

RAPD markers on durum wheat

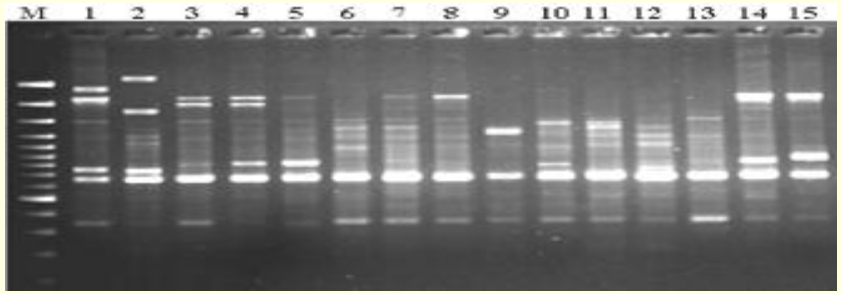


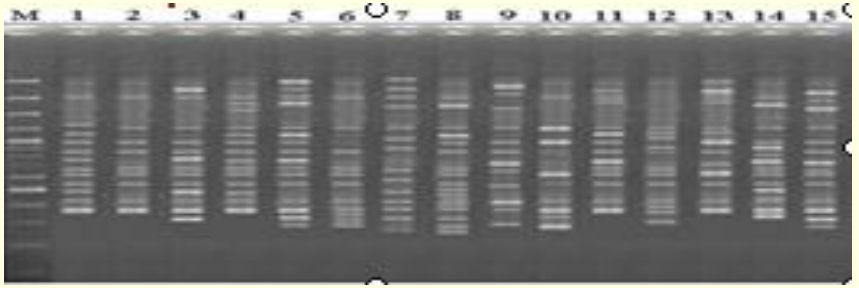
RAPD and ISSR markers on sugar beet





RAPD and ISSR markers on chickpea





Capacity development

(PhD theses)

Dr. Zeynal Akparov from AGRI and **Dr.Safa Kumari** from ICARDA

Legume virus diseases spread in Azerbaijan

Eldar Mustafayev's PhD thesis was done in Virology laboratory at ICARDA and was fully financed by ICARDA. Within this PhD work a survey was conducted in different regions of Azerbaijan and as a result 6 new isolates were detected for the first time and registered in International Genebank. 2 papers were published on the results of this thesis in Plant Diseases (USA) and Australasian Plant Patology Journal. It should be emphasized Eldar is the first specialist on plant virology from Azerbaijan. Strong background got during his PhD was very useful and he continued his post-doctorate research in France and USA. The creation of virology laboratory similar to ICARDA's was decided by Dr.Zeynal Akparov and all equipments has already been bought. After E.Mustafayev get back from USA he will continue his research in this laboratory.

Capacity development

(PhD theses)

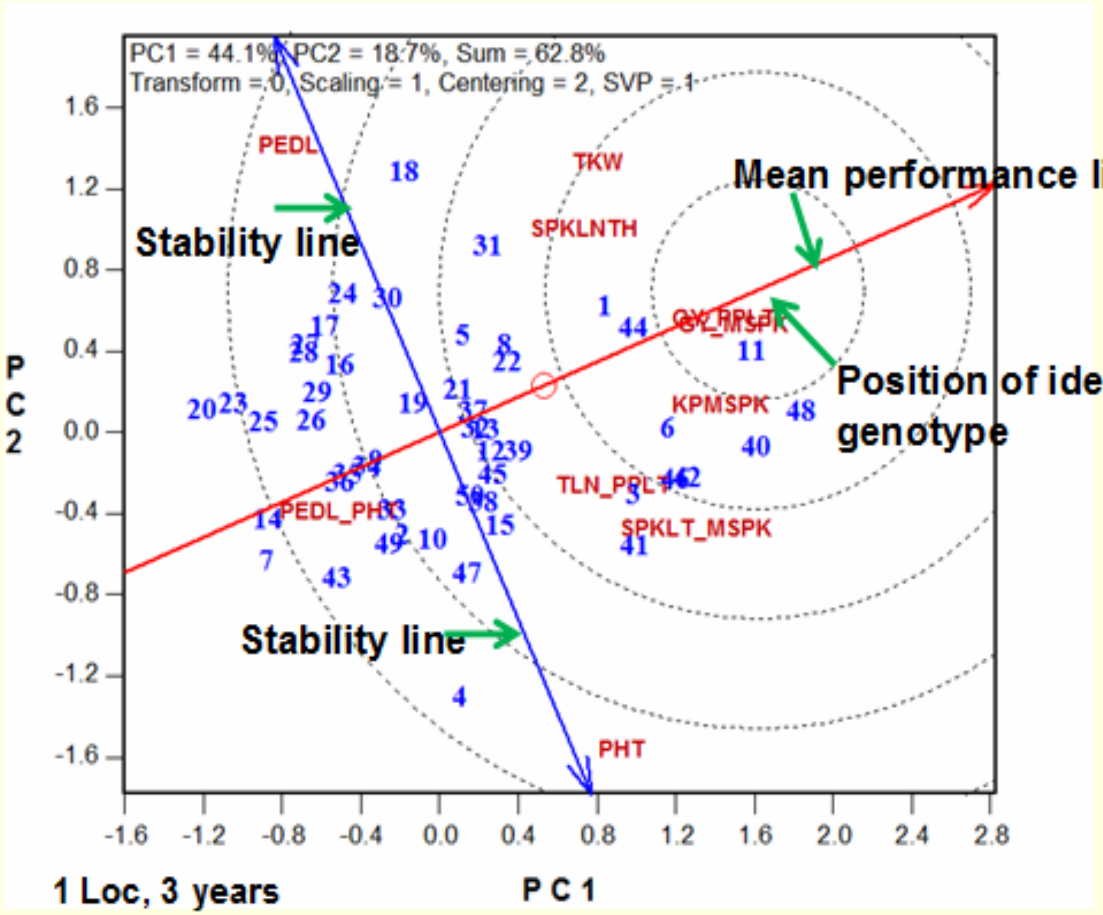
Dr. Zeynal Akparov from GRI
Dr. Ram Sharma from ICARDA

Salinity tolerance in wheat: genetic control and association of traits

(Sevinj Nuriyeva)

Within this PhD thesis salinity tolerance of 50 bread wheat accessions was assessed in both filed and greenhouse conditions. As a result of GGE Biplot analysis 12-15 best genotypes were identified and hybridization in 5 combinations was done. The research is now being carried out on molecular level in Biotech lab.

Ranking of 50 winter wheat genotypes based on 10 traits under saline conditions – GGE biplot



Genotype and Genotype x environment (GGE) biplot

Capacity development

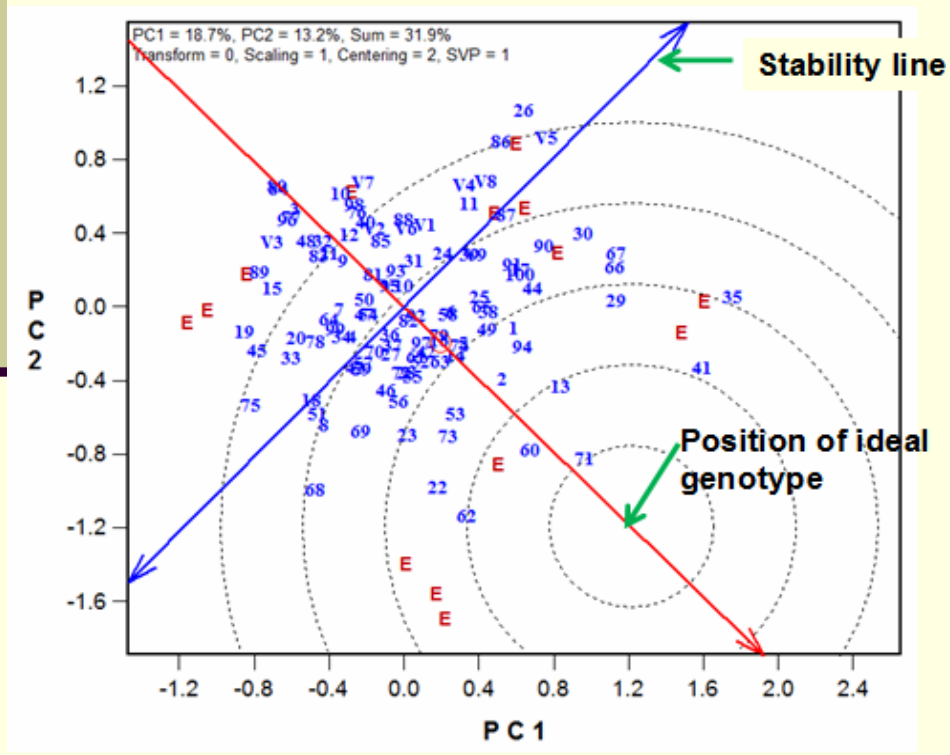
(PhD theses)

Dr. Ziya Abilov from AGRI and **Dr. Ram Sharma** from ICARDA

Evaluation of genetic resources of bread and durum wheat for terminal heat tolerance in Azerbaijan

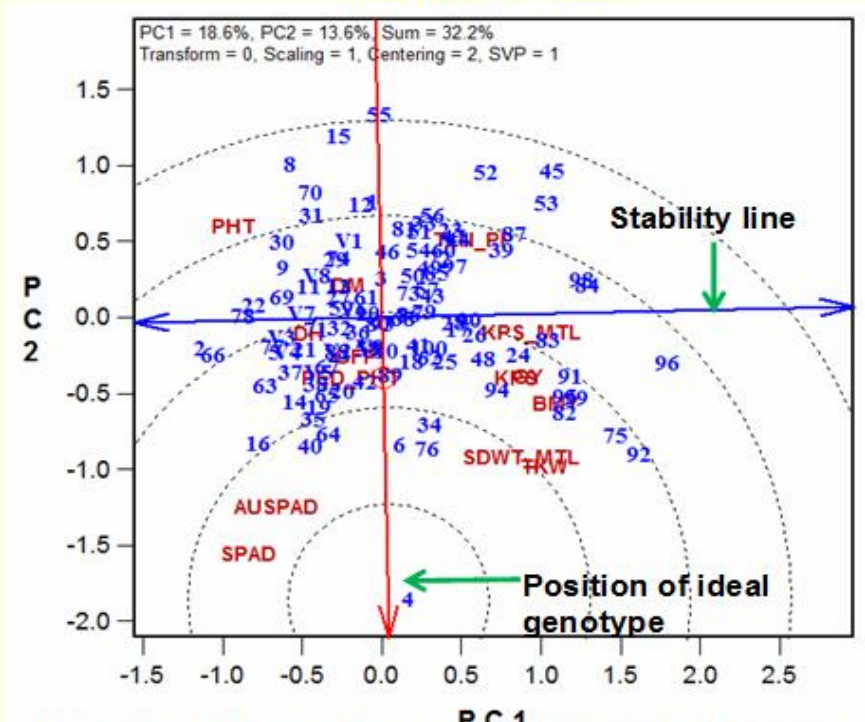
The research are being done on a big collection consisted from 200 accessions and 20 local wheat varieties. 20 durum and 20 bread wheat accessions with best performance were selected with GGE biplot analysis.Currently ssr markers are being used for molecular research.

Ranking of 110 durum wheat genotypes based on 14 traits



Genotype and Genotype x environment (GGE) biplot

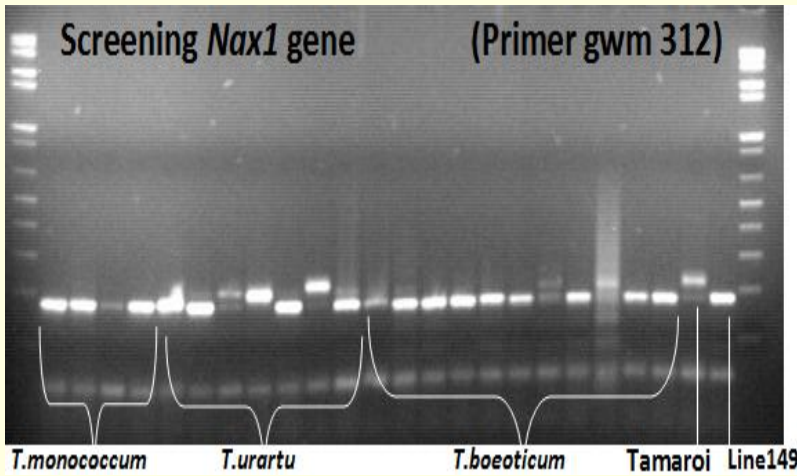
Ranking of 110 winter bread wheat genotypes based on 14 traits

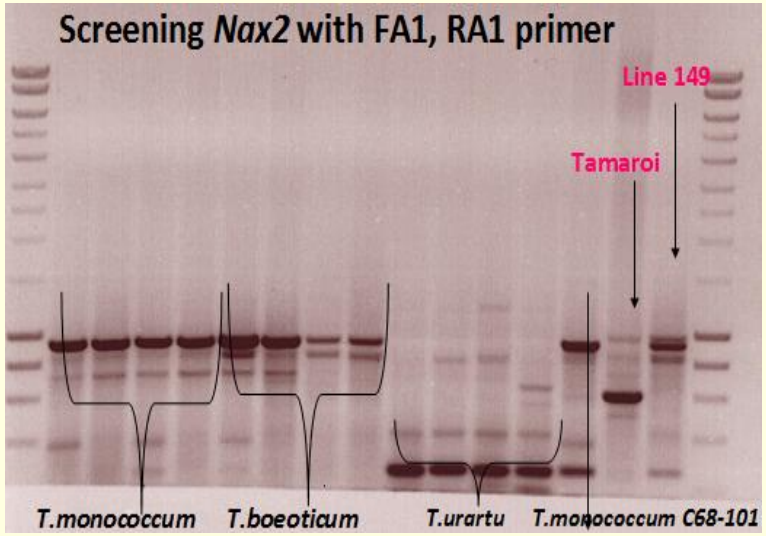


Genotype and Genotype x environment (GGE) biplot

Joint projects and researches

In 2007 with the support of Dr. K. Street one young scientist was a winner of Vavilov-Frankel Fellowship announced by Bioversity International (Italy) and within 6 months successfully completed a project on “Eco-geographic distribution of diploid wheats” in Australian Functional Plant Genomic Centre of Adelaide University and Molecular wheat laboratory of Plant Industry Institute in Australia. It was revealed that *Nax 1* and *Nax 2* genes are only expresses in *T. monococcum* and has an important role in salt tolerance of this specie. It was proved that *T. uraratu* specie also had sodium exclusion gene or genes other than *Nax* genes. The results were reported in research institutes of Australia and Bioversity International in Italy. The reports were highly appropriated and scientist’s participation in 5th international crop science congress held in Jeju, Korea was funded by Bioversity International.





Benefits of AGRI and ICARDA collaboration

- National Genebank was established within AGRI
- National DataBase on PGR was constructed
- Modern biotechnology and virology laboratories were established
- High skilled national specialists were trained:
  - 3 national specialists on Genebank management
  - 2 national specialists on PGR data base
  - 3 specialists on plant breeding
  - 1 specialist on plant virology
  - 7 specialists on plant biotechnology
- Access to Peer reviewed journals (~12 papers)

- **Two scientists conducted experiments in Turkey and in Mexico with the financial support from CIMMYT**
- **5 national specialists have been in France, Turkey, Germany for 1-3 months within Marie Curie research exchange program**
- **Since 2009 nine young scientists have got Erasmus Mundus and have done some part of their PhD research in Greece, Germany, Poland, Estonia**
- **FAO has financed the participation of our national scientists in different workshops, trainings through travel and conference grants**
- **2 young scientists have got FEBS fellowship and did research work in INRA, France**

Training themes for future collaboration

- NGS data analysis
- Molecular breeding
- DH plants
- Synthetic wheat
- Biostatistics
- Bioinformatics
- Risk assessment on GM crops etc.
- To collaborate within HORIZON 2020

Thank You for Attention