

**COTTON RESEARCH PROGRAMS OF UZBEKISTAN AND ITS  
CONTRIBUTION FOR WORLD COTTON RESEARCH COMMUNITY**

**Ibrokhim Y. Abdurakhmonov and Abdusattor A. Abdukirimov  
Institute of Genetics and Plant Experimental Biology  
Academy of Sciences of Uzbekistan**

**Abstract**

The development of early-ripening, salt- and drought-tolerant, insect- and disease-resistant cotton varieties with superior fiber quality is the priority of cotton research program in Uzbekistan. Negative correlations among favorable traits in cotton and the narrow base of cotton germplasm used in breeding programs made it very difficult breeders to develop such elite varieties of cotton for different regions of Uzbekistan. However, conventional breeding methods in combination of radioactive mutagenesis have been successfully used to overcome breeding problems and develop elite, productive and highly adapted cotton varieties during the past century. Highly productive and resistant varieties with superior fiber quality such as AN-Bayaut-2, Yulduz, Toshkent-6, AN-402, AN-Uzbekiston-4, Sharaf-75, Armugon, Gulbahor, Navbahor, Ilgor Mekhnat, Mekhr, Khazina, Diyor, Zangi-Ota, Durru-gauhar, Dekhqonbob, AN-512U, and AN-513 were developed using conventional breeding method.

Development of science and technology to higher levels, in particular the appearance of ‘genomics’, promises to enable cotton breeders with the ability to more rapidly produce elite cultivars, opening a new era in cotton breeding – “marker-assisted selection” (MAS). Modern molecular marker technologies make it possible to quickly and reliably identify chromosomal regions containing genes that control agronomic traits, and to orchestrate the introduction of these genes into elite cultivars. Marker-assisted breeding allows the selection of superior genotypes in early generations, accelerating the development of new cotton cultivars with high yield potential and superior fiber quality. The program for MAS of cotton has been developing for decades in our Institute. Several protein and secondary metabolite markers associated with wilt resistance, salt and drought tolerance, fiber quality have been developed and being successfully used to evaluate cotton varieties for traits of interest. Moreover, molecular mapping of agronomically important traits using DNA markers such as RFLP, AFLP, SSR and CAP markers is progressing well. A number of new SSR and EST-SSR markers linked to important fiber and other agronomic QTLs have been mapped. Newly initiated “linkage disequilibrium” mapping of agronomically important traits from Uzbek cotton germplasm resources is also under way to quickly identify new genes potential to contribute important traits of cotton, accelerating breeding programs in Uzbekistan. In addition, the Institute is successfully developing capabilities for creating transgenic cottons. Transformation methods for genotypes of elite cotton varieties of the Institute have been developed and transgenic lines resistant to BASTA have already been obtained.

The Institute has a large cotton germplasm collection, from which cotton breeders will be able to develop more valuable varieties in the future, using a combination of conventional breeding methods and new molecular approaches. Development of new biotechnologies in our Institute and their incorporation with cotton breeding programs as well as international collaborations within ICGI will determine the future of Cotton Science in Uzbekistan, and the future of cotton as the key textile fiber in the world market.