

heat tolerant genotypes using different screening methodologies, dissecting these complex traits into its components, and identify genes/QTLs for each component to pyramid them in good agronomic background using both conventional and molecular approaches. The current methodologies in use to screen for heat and drought in chickpea, lentil and faba bean include delayed planting of germplasm/improved materials to coincide flowering time with high temperature shocks, late planting on receding soil moisture and under low rainfall sites for drought. These methodologies have helped to improve germplasm and are being supplemented with genomic resources to generate additional knowledge which may further help in understanding these stresses. In this paper, we discuss breeding strategies for adaptation of food legume crops to cope with stresses under the climate changes.

Keywords: adaptation, climate change, drought, food legumes heat, germplasm, mitigation,

2.4.10. Community-based breeding programs to exploit genetic potential of adapted local sheep breeds in Ethiopia

A. Haile¹, T. Mirkena¹, G. Duguma¹, T. Getachew¹, Z. Edea¹, M. Tibbo⁴, L. Iñiguez⁴, B. Rischkowsky⁴, A.M. Okeyo³, M. Wurzinger² & J. Sölkner²

¹International Livestock Research Institute (ILRI), P.O. Box 5689, Addis Ababa, Ethiopia; e-mail: a.haile@cgiar.org;

²BOKU - University of Natural Resources and Applied Life Sciences Vienna, Department of Sustainable Agricultural Systems, Gregor-Mendel-Str. 33, A-1180 Vienna, Austria;

³Haramaya University, P.O. Box 38, Haramaya, Ethiopia;

⁴International Centre for Agricultural Research in the Dry Areas (ICARDA), P.O. Box 5466, Aleppo, Syria;

⁵International Livestock Research Institute (ILRI), P.O. Box 30709, Nairobi, Kenya

Indigenous breeds are likely to cope better with climate change than exotic breeds, because they are already adapted to harsh conditions. Breeding programs will not be able to improve adaptation

traits in exotic breeds fast enough to keep pace with climate change. The better alternative is to focus on improving production traits in indigenous breeds. Designing breeding programs for indigenous breeds owned mostly by small-scale farmers requires, among others, an understanding of the production system of the target area and the definition of breeding objectives in a truly participatory manner. The research project presented here is designing community-based sheep breeding strategies in four locations, representing different agro-ecologies that provide the habitat to four indigenous sheep breeds (Afar, Bonga, Horro and Menz). The production systems were described using surveys and workshops. Breeding objective traits of sheep owners were identified by employing different methodologies such as surveys, hypothetical choice experiments, and ranking of live animals in the farmers' own flocks and of groups of animals penned in a central location. The application of various methods allowed a validity cross-check of results and ensured that all traits are captured. The production systems were characterized as a pastoral system for Afar, a mixed crop-livestock system for Horro and Bonga, and sheep-barley system for Menz. The mating system was predominantly uncontrolled. Early disposal of breeding stock, diseases and feed shortage (mainly in Afar and Menz) were identified as the major problems. Six traits for ewes (body size, coat color, mothering ability, twinning, lambing interval, tail type) and five traits for rams (body size, coat color, tail type, libido and presence or absence of horn) were identified as breeding objective traits of the smallholders, and one additional trait (milk yield) for Afar. This information was used in the simulation of alternative breeding strategies for the different communities and then discussed

Keywords: breeding objectives, community based breeding, Ethiopia, indigenous sheep breed,