The Zea French Biological Resource Centre: conservation and utilization of maize genetic resources in France

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Maize genetic resources are organized in France through the French maize genetic resources network. It includes public (INRA) and private actors (ProMaïs association). Maize Genetic resources include 1600 open pollinated populations and 4600 inbred lines. Their management is run by the Zea BRC (Biological Resource Center) shared between the UMR AGAP (populations) and the maize Experimental Unit of Saint Martin de Hinx (inbred lines). At national level, the Zea BRC is included in the French network RARe (Infrastructure Ressources Agronomiques pour la Recherche) and in the Plant network ARCAD. The basic activities of the Zea BRC are conservation, distribution and multiplication of populations and inbred lines. Genetic resources are distributed following international rules either with the International Treaty on Plant Genetic Resources for Food and Agriculture, the Nagoya Protocol or private rules (depending on the accession status). Information on genetic resources is available in the national database (Siregal) and a national portal (Florilège). Information on the traditional cultivation and use practices of populations can also be found on the Promaïs website.

A large fraction of these genetic resources have been characterized for their genotypic diversity and phenotypic variation by the CRB and partner research labs. Genotyping of populations and first cycle inbred lines revealed new features regarding the introduction and spread of maize in Europe, as well as local geographical trends (Brandenbourg et al., 2017, Nicolas et al., Diaw et al., this meeting). Broad or heterotic group specific panels of inbred lines have been defined within CornFed, DROPS and Amaizing projects to conduct Genome Wide association mapping revealing key loci for flowering time, heat and drought tolerance (Millet et al., 2016, Bouchet et al., 2017, Gouesnard et al., Blein-Nicolas et al., this meeting). These valuable resources allowed the development of multi-parental populations and introgression libraries to further dissect the genetic mechanisms of adaptation traits.

Discussions have been started at European level, to build a European Zea network to reinforce the means in conservation and utilization of European maize genetic resources. The network would also permit a better sharing of tasksforces and means in Europe and avoid gaps and losses in temperate genetic resources in Europe.