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EDITORIAL

Sorghum, a promising multiple-use crop for dry and hot climates

Zhanguo Xin[1] · **Robert Aiken**[2]

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The topical collection SORGHUM was commissioned by PLANTA to highlight the unique attributes of this important plant species. Peer-reviewed original-research articles in this collection covered multiple aspects of sorghum biology including plant physiology (ecological and environmental), metabolism, growth and development, molecular biology, plant–microbe interactions and systems biology. Review articles addressed ecological and environmental physiology as well as biotechnology applications. We thank all authors for their substantial contributions.

Originated in tropical Africa, sorghum [*Sorghum bicolor* (L.) Moench] proved to be an important food crop of subsistence for many of the arid and semi-arid regions of the world because of its excellent tolerance to drought, high temperature, salinity, and marginal soil quality. Sorghum is also used as a source of forage and fiber. Recently, it has emerged as an important bioenergy feedstock to provide sugar and cellulosic/lignocellulosic biomass. It performs C4 photosynthesis and can produce greater biomass and grain yields than C3 crops. With a relatively small, well-annotated diploid genome (~ 730 Mb), pan-genome, diversity panels for genome-wide association analysis, mapping populations and mutant libraries, sorghum can serve as model for other C4 crops with larger and more complex genomes. All these assets of sorghum are covered and extensively discussed in this topical collection.

Compared to maize and other major crops, grain yield of sorghum is relatively lower. The major reason is that sorghum is often planted on relatively poor soil with low priority for irrigation and fertilization. Lack of research funding is another reason. As the world becomes hotter and drier, sorghum will play a major role in food and energy security, while preserving the environment. However, to be competitive with other C4 crops, sorghum yield must be improved. Because maize and sorghum share the same efficient type of C4 photosynthesis, sorghum yield can in principle match that of maize. With all the resources and research tools available, it is time to tackle this important issue. Working together, we should be able to overcome the barriers limiting sorghum grain yield advance.

✉ Zhanguo Xin
zhanguo.xin@usda.gov

Robert Aiken
raiken@ksu.edu

[1] USDA-ARS Plant Stress and Germplasm Development Unit, Crop Systems Research Laboratory, 3810 4th Street, Lubbock, TX 79424, USA

[2] Northwest Research-Extension Center, 105 Experiment Farm Road, P.O. Box 505, Colby, KS 67701, USA