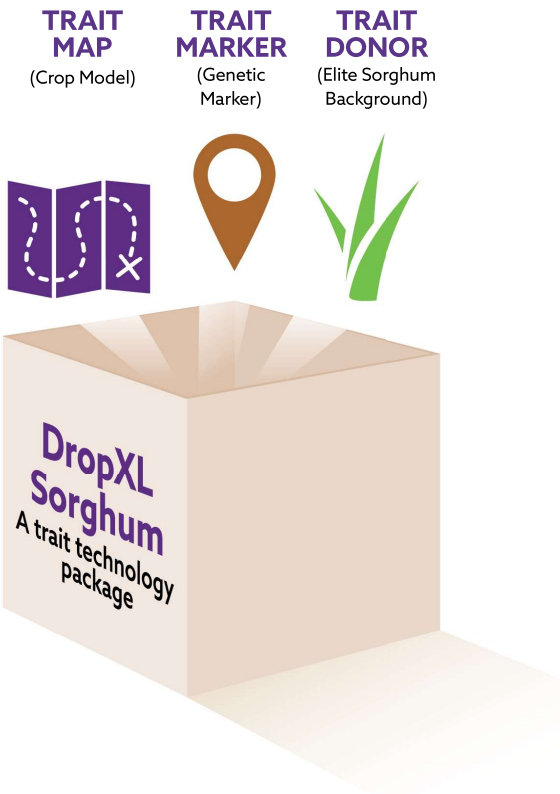
# DropXL:

## Trait Technology for Water-Optimized Sorghum in Kansas

Kansas farmers and water stakeholders need tools to increase crop productivity while preserving water resources. DropXL Sorghum is a trait technology package to provide farmers with sorghum technology for higher productivity under moderate water limitation. DropXL will identify optimal trait combinations for water productivity across Kansas' target environments (Trait Map), identify genetic markers for targeted trait in field trials (Trait Marker), and develop improved trait donor lines to facilitate water-optimized sorghum hybrids (Trait Donor).




**DropXL uses limited transpiration (LT), a plant trait for water response. With the LT trait a crop limits water loss when air is dry to better utilize water for yield productivity.**

### TRAIT MAP

To design water-optimized sorghum, DropXL ran crop simulations. Simulations of long-term rainfed conditions (Colby, GC and Manhattan) suggest the DropXL trait can **conserve soil moisture** to **increase yields by 4%**.

### TRAIT MARKER

In the 2019 field season, DropXL identified a sorghum with low water use (transpiration) during high temperature. This sorghum **reduced the water demand by 5% and 2%** compared with commercial hybrids.

### TRAIT DONOR

To build elite donor lines for the sorghum seed industry DropXL initiated **new breeding populations with 350 crosses** of elite parent lines and non-elite trait donors. These crosses were advanced in winter and summer nurseries.


## 2021 RESEARCH PLANS

Experimental sites in Manhattan and Colby, Kansas.

Characterize trait and grain yield in well-watered and water-limited environments.

Advance sorghum population for trait mapping.

Test potential lines as candidate backgrounds for the trait donor.

## THE TEAM

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CENTER FOR SORGHUM IMPROVEMENT