

PROVIDING ECOSYSTEM SERVICES UTILIZING COMPANION CROPS WITH SORGHUM

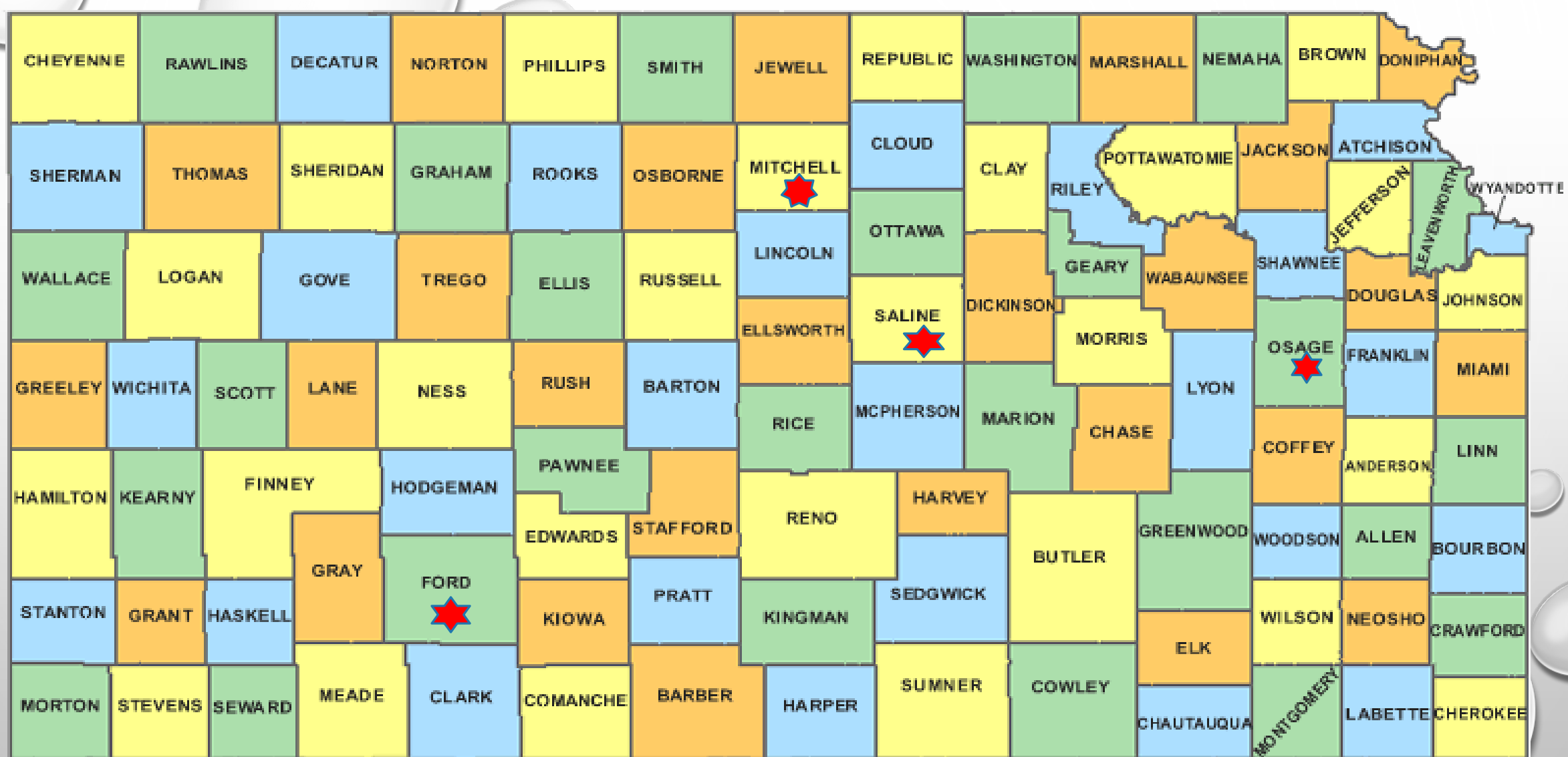
A PARTNERSHIP GRANT WITH NORTH CENTRAL REGION OF
SUSTAINABLE AGRICULTURE RESEARCH AND EDUCATION

PROJECT OBJECTIVES

- **DEMONSTRATE APPROPRIATE COMPANION CROPS CAN BE VIABLE ALTERNATIVES TO CROP PROTECTION PRODUCTS**
- **DEMONSTRATE WHICH FAMILIES OF COMPANION CROPS CAN BENEFIT SORGHUM PRODUCTION**
- **PROVIDE DEMONSTRATION PLOTS AVAILABLE FOR OTHERS TO OBSERVE AS WELL AS HOST FIELD DAY**
- **DOCUMENT RESULTS OF YIELD VARIANCE AND ECONOMIC DIFFERENCES BETWEEN COMPANION PLOTS AND NON-COMPANION FIELDS ALONG WITH SOIL HEALTH BENEFITS IE: TOTAL CARBON, INFILTRATION, BULK DENSITY, PENETRATION RESISTANCE, SOIL RESPIRATION AND MACRO-INVERTEBRATE POPULATION COUNTS**

WHAT ACTUALLY HAPPENED

15 ACRES OF SORGHUM WITH A COMPANION COVER CROP MIX AS A DEMONSTRATION/EDUCATION PLOT. THE COMPANION CROP MIX WAS DESIGNED TO PROVIDE AVAILABLE SOIL NUTRIENTS IN SYMBIOSIS WITH THE SORGHUM, PROVIDE WEED SUPPRESSION AND ATTRACT BENEFICIAL INSECTS. NO-TILL ON THE PLAINS WORKED WITH FOUR PARTICIPATING PRODUCERS AND A COVER CROP SEED PROVIDER TO DETERMINE THE BEST SPECIES TO MEET THE NEEDS OF THE PROJECT OBJECTIVES. THE COMPANION SPECIES/MIXES WERE CONSISTENT AT ALL OF THE SITES



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No·till

On The Plains





Companion species

Buckwheat	4 lb
Mung bean	3 lb
Flax	3 lb
Phacellia	1 lb
Crimson Clover	2 lb
Guar	3.67 lb

Planted 15-16 lbs per acre

Cost \$17.50/acre

OTHER INFORMATION

- SORGHUM PLANTED AT 45,000-60,000 SEEDS PER ACRE
- PRE-RESIDUAL HERBICIDES WERE USED PRIOR TO PLANTING BUT NOTHING AFTER PLANTING ON PLOTS
- ALL PLOTS HAD A COVER CROP PLANTED AHEAD OF THE SORGHUM
- 3 OF THE 4 PLOTS HAD COMPANIONS PLANTED IN THE SAME FURROW AS THE SORGHUM, ONE HAD THEM BETWEEN THE ROWS
- ALL BUT 1 OF THE PLOTS HAD NITROGEN APPLIED BEFORE PLANTING STARTER FERTILIZER APPLIED WITH THE SORGHUM, NO POST FERTILIZER WAS APPLIED
- NO ADDITIONAL HERBICIDES OR INSECTICIDES WERE APPLIED TO THE PLOTS







July

August



August









YIELD RESULTS

Site	Yield Inside Plot, bu/acre	Yield Outside Plot, bu/acre
Ford County *	76	82
Mitchell County	121.9	121.2
Osage County **	23.4	24.3
Saline County	107	109

- * Field and plot had hail damage on July 29, sorghum without hail damage yielded 110 bu/acre
- ** No moisture from plant date, June 1, until August 20

SOIL SAMPLING RESULTS

• GENERAL OBSERVATIONS FROM DEMONSTRATION PLOTS

- PRE-RESIDUAL HERBICIDES DID HAVE AN IMPACT ON THE SURVIVABILITY OF THE COMPANION CROPS
- PHACELLIA AND CLOVER STRUGGLED TO ESTABLISH IN MOST PLOTS
- THE MIX WAS DESIGNED TO ATTRACT BENEFICIAL INSECTS, IT DID ATTRACT A GOOD POPULATION OF APHID PREDATORS
- THE MIX DID HAVE POSITIVE BENEFITS ON WEED POPULATIONS IN SOME OF THE DEMONSTRATION PLOTS
- COMPANION MIX DID MAKE HAVE BENEFIT TO SOILS