ABSTRACT
Organic dairy cattle need at least 120 days of grazing pasture. Therefore, pasture management is important to organic dairy farming. Pastures in Minnesota normally rely on cool season grasses, which experience depressed growth during the summer. Warm season grasses may be a solution to maintain productivity during the summer. Two pasture systems (cool and warm season grass species) with enhanced in-field and landscape species diversity were analyzed for forage quality characteristics across the grazing season at the West Central Outreach and Research Center organic dairy in Morris, MN for two years. System 1 was a diverse-mixture of cool season grasses and legumes (perennial ryegrass, white clover, red clover, chicory, orchardgrass, meadow bromegrass, alfalfa, meadow fescue). System 2 was a succession of perennial polycultures and annual-warm season grasses (BMR sorghum-sudangrass and teff grass). Cows (n=90) were Holstein, Swedish Red, Normande, and Jersey crossbreds blocked by DIM and breed. Milk production, body condition score, and body weight were analyzed across the grazing season for two years. Cool-season pasture systems had greater crude protein and NDF digestibility; however, dry matter did not differ between pasture systems. The trend of milk production was similar in both systems across the grazing season. There was a year effect on milk production in both pasture systems. Milk production was higher in system 2 during the warm months of summer and higher in system 1 during spring and fall, with no difference in average milk production across grazing season. This information will be important to organic dairy producers who want to extend the productivity of their pastures and cows during the grazing season.

INTRODUCTION
Grazing management is an important part of dairy production in the Midwest. Organic dairy cattle must graze pasture 120 days of the year and receive 30% of dry matter from pasture (National Organic Program, USDA, 2010).

Cool season grass species are common in Midwest pastures, but experience a semi-dormant stage during the warm, dry months of summer. Warm season grasses may provide a solution to provide pasture forage during hot, dry weather.

BMR sorghum sudangrass has been used in grazing systems incorporating warm season grasses, but there is little research on its use in the Midwest.

Teff grass has been used as an emergency crop in some states, but there is limited research about feeding it to dairy cattle in grazing systems.

OBJECTIVE
The objective of this study was to analyze the forage quality characteristics of the warm season grasses BMR sorghum sudangrass and teff grass used in a warm season grazing system, across the grazing season, and compare with cool season perennial pasture species of a cool season grazing system.

METHODS
Cows:
• Two replicated groups of 15 cows were grazed in three blocks in either the cool season or the warm system.

Pastures:
• Cool season perennial pastures were established in 2012.
• Warm season grasses were planted May 28 of each year.
• Pastures were grazed 6/2-10/22 in 2014 and 5/18-10/16 in 2015.

Pasture forage samples:
• Pasture grass samples were clipped every other day, before cows moved to a new paddock.
• Samples were analyzed at Rock River Labs in Watertown, WI.

RESULTS
CONCLUSIONS
BMR sorghum sudangrass and teff grass can be used in rotational grazing systems in the Midwest without sacrificing forage quality or milk production. To look more closely at forage quality, we will be working on a study using a dual flow continuous culture rumen fermentation system to determine and compare the digestibility of BMR sorghum sudangrass, teff grass, a cool season grass mixture, and alfalfa.

In addition, we will carry out a third year of grazing in order to evaluate the economics of incorporating these warm season grass species into a grazing system.

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