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INTRODUCTION

- Teff [*Eragrostis tef* (Zucc.) Trotter] is one of the crops that have captured attention of producers, health food industry and business entrepreneurs in the U.S. due to its multiple uses.
- The grain of teff contains high level of several minerals and essential amino acids. It is low in gluten.
- Forage/hay is among the best quality grasses.

OBJECTIVE

To evaluate the establishment, grain and forage yields, and grain quality of teff in North Central Oklahoma.

METHODS

- 4-6 varieties were evaluated at three locations.
- Design: RCBD with 2-blocks and sub-sampling.
- Measurements include emergence, stand assessment, plant height, panicle length, # of nodes, internode length, forage and grain yields, lodging, and grain mineral contents.
- Mineral composition and protein content of teff grain for washed and unwashed samples were performed by Soil, Water and forage analytical lab (SWFAL) following established procedures.
- All data were subjected to statistical analysis in SAS.
- Data was not available from two locations due to extreme weather (fig 1).

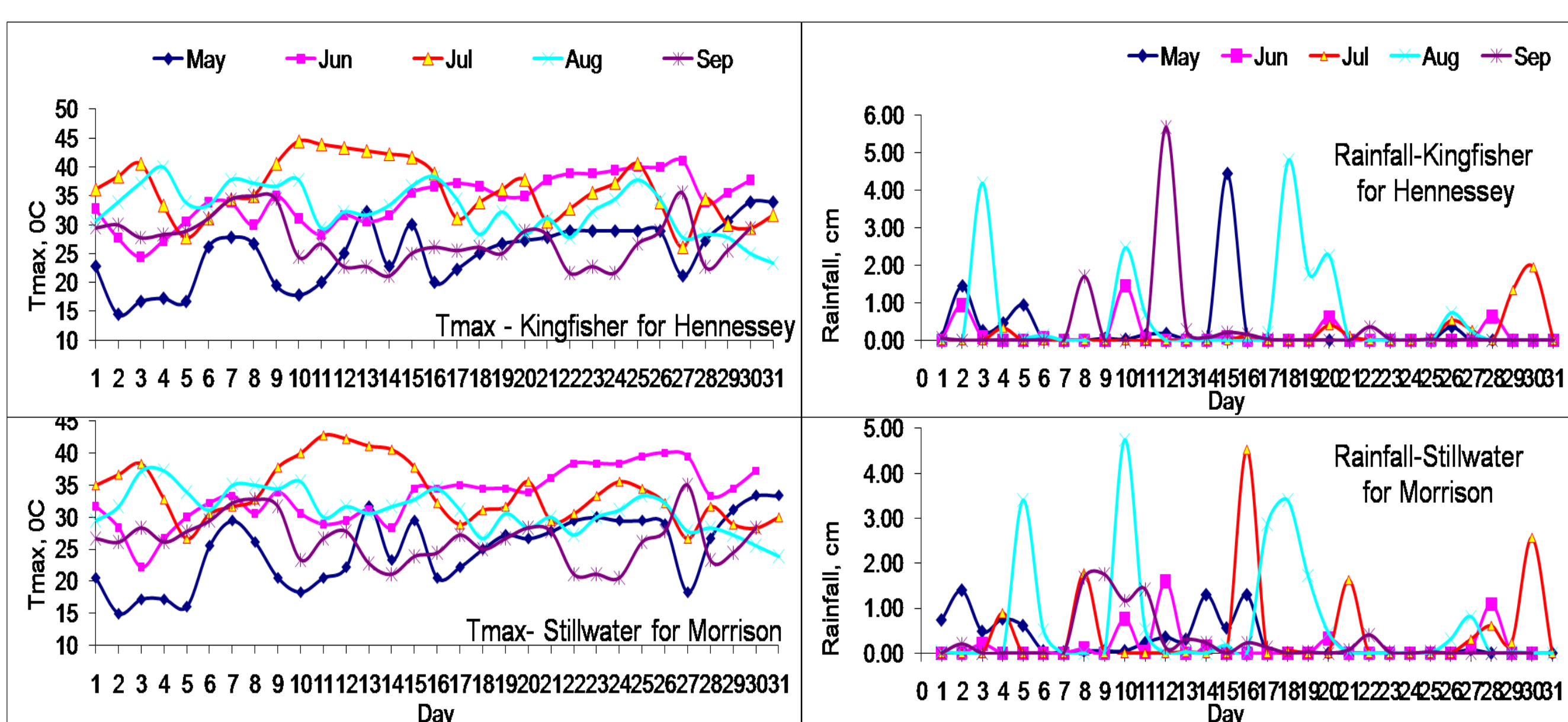


Fig 1. T_{max} and rainfall at closest weather stations to Hennessey and Summers/Morrison, OK, May-Sep, 2009.

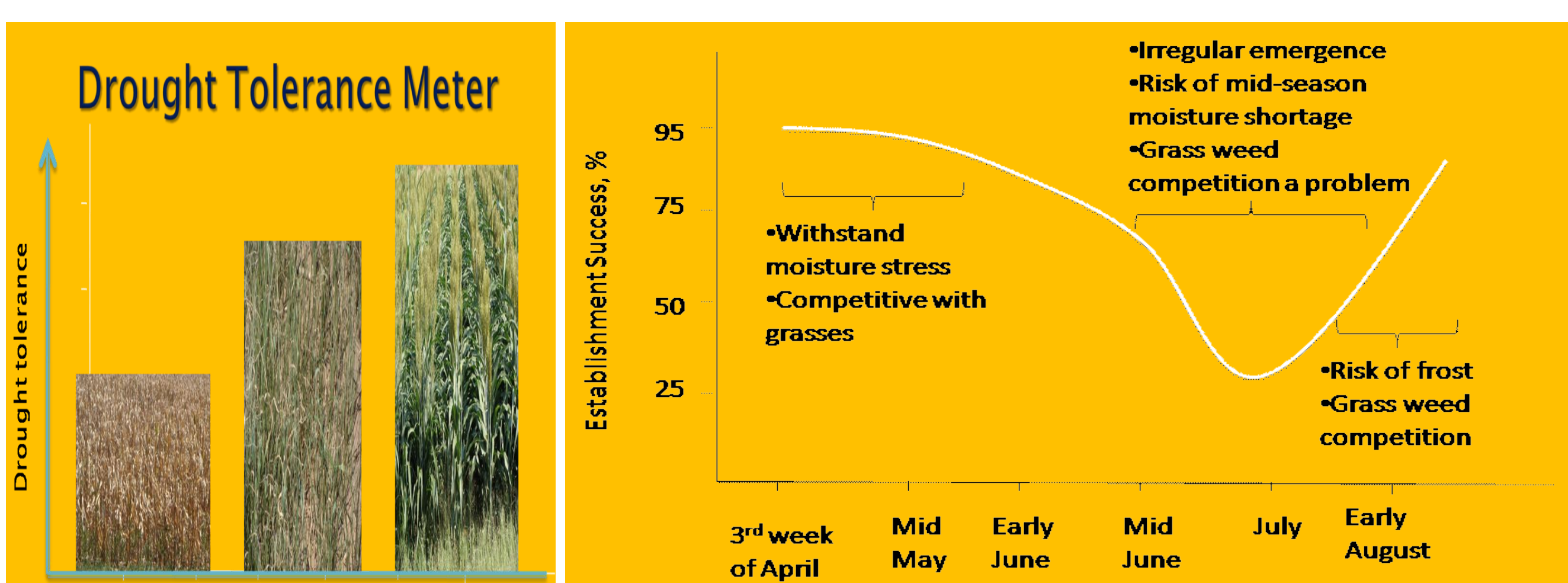


Fig 2. Teff drought tolerance and establishment time in North Central Oklahoma.

RESULTS

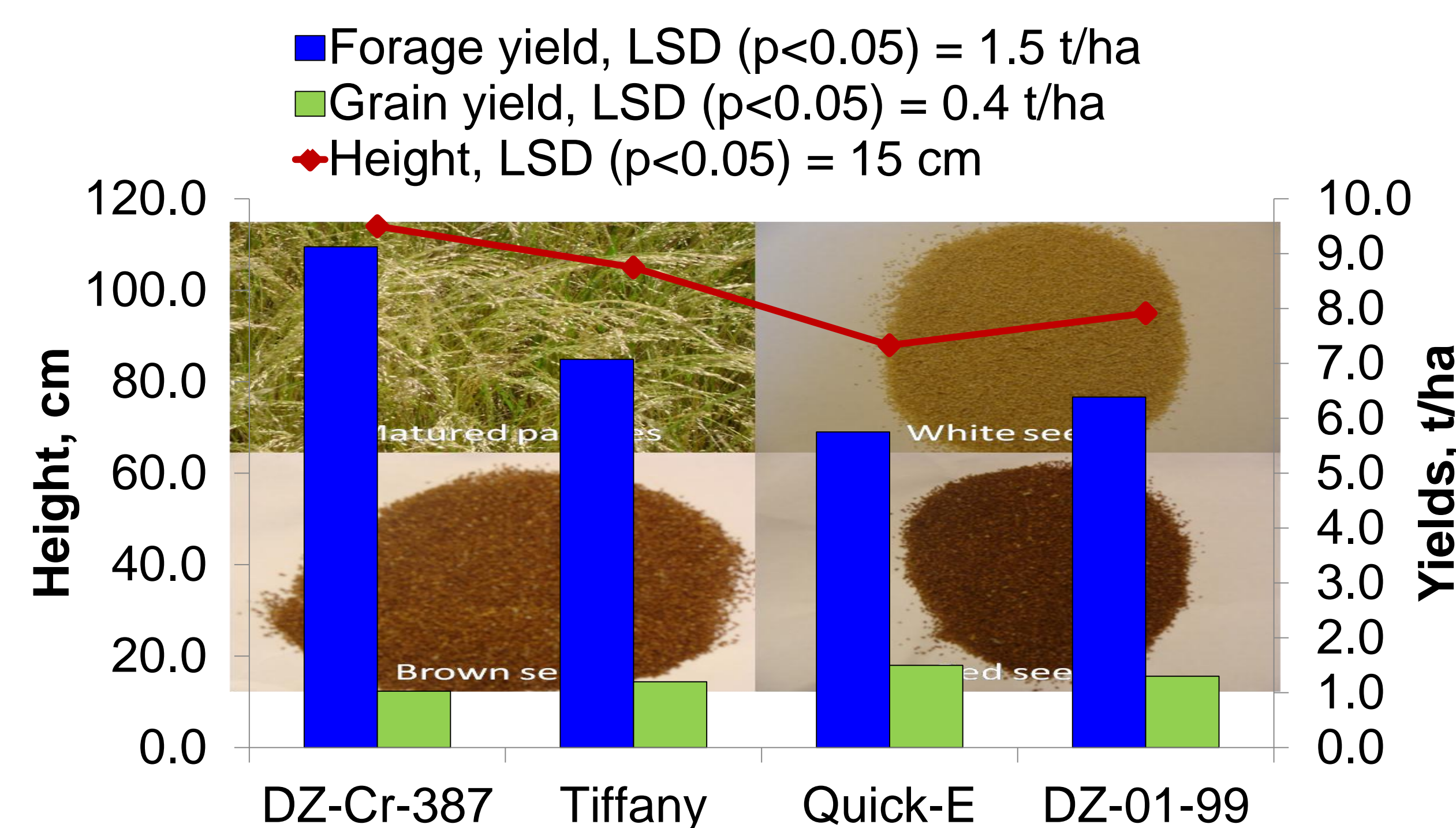


Fig 3. Forage yield and plant height of teff averaged over two locations (Hennessey and Summers, OK), 2009.

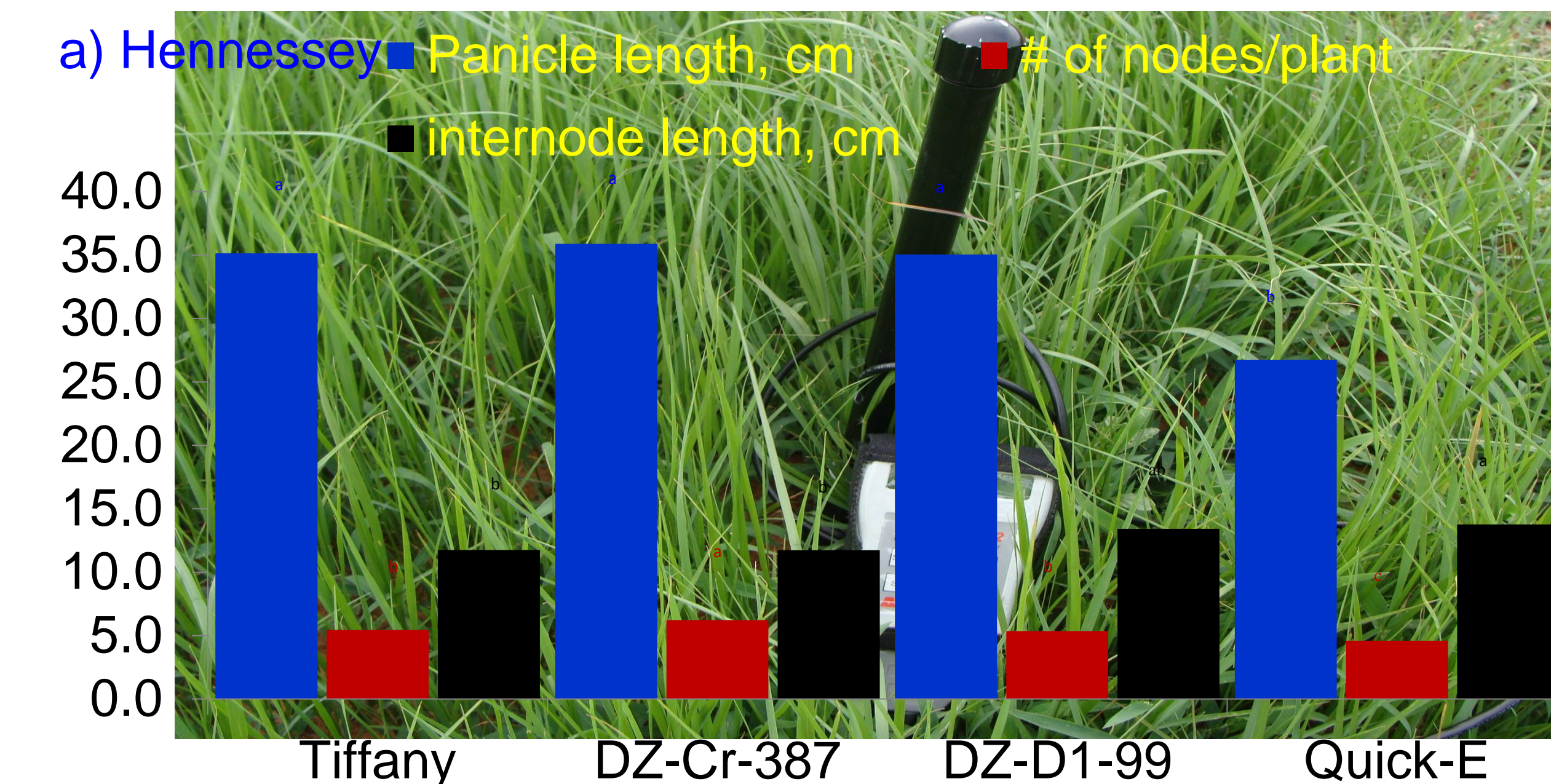


Fig 4. Panicle and internode lengths, and # of nodes for four varieties of teff grown at Hennessey, OK, 2009. Within series, bars followed by the same letter case are not different at 5% probability.

- OK-DZ-X-01 had the highest forage yield and height. But it had the lowest grain yield (Fig. 3).
- Generally plant height and forage yield were positively correlated ($r=0.7$, $p<0.01$) with each other. However, grain yield was highest (1.5t/ha) for the shortest variety- Quick-E.
- Panicle and internode lengths among varieties were different at Hennessey and Summers (Fig. 4&5).

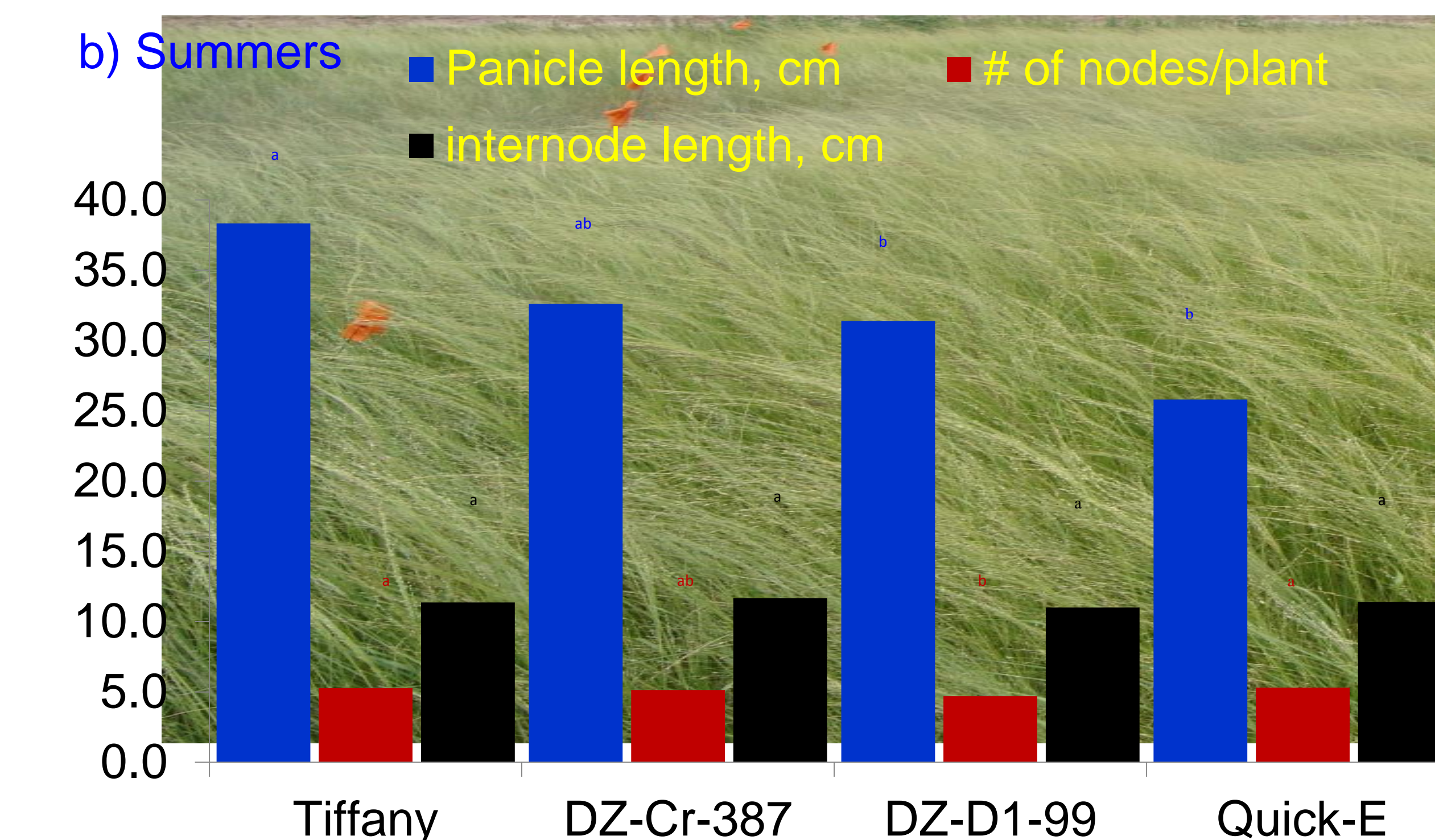


Fig 5. Panicle and internode lengths, and # of nodes for four varieties of teff grown at Summers, OK, 2009. Within series, bars followed by the same letter case are not different at 5% probability.

- Teff grain had the highest Ca, Fe, Mg, Zn and protein content vis-à-vis winter wheat, corn and grain sorghum.
- Red colored variety had higher Fe than white colored teff (Table 1).
- Washed teff grain (white and red) had lower Fe content than unwashed teff grain. But Fe content was still higher than other grain crops. Grain Sorghum had Fe content close to white teff.



Fig 6. Left: Teff hay 4.8 t/ha at first cut at Summers. Teff did not start to grow actively before mid July due to heat and lack of precipitation. Teff grows at a very fast rate if moisture and temperature are conducive. Right: Teff at Hennessey grown close to 1.3 m.

Table 1: Some teff grain quality characteristics compared with common cereals.

Description	Ca (%)	Fe (ppm)	Mg (%)	Zn (ppm)	Protein (%)
unwashed white teff	0.17	94	0.22	63	14.5
unwashed red teff	0.16	109	0.21	65	15.3
washed white teff	0.15	70	0.21	63	14.2
washed red teff	0.17	88	0.22	88	14.8
T-test ($p<0.05$)	ns	*	ns	ns	ns
Wheat grain	0.05	37	0.13	35	11
Sorghum grain	0.02	68	0.17	0.99	9.5
corn grain	0.02	50	0.12	24	10.9

SUMMARY

- Teff has great potential in North Central Oklahoma. Grain quality was better than common cereals grown in Oklahoma.
- The data reported herein was gathered from teff grown under extreme growing conditions. Yield was reduced due to high temperature in July-August and excess rain at the end of August near maturity. In greenhouse, yield of 3.6 and 4.6 t/ha for white and red teff, respectively was recorded.
- Almost all varieties are susceptible to lodging.
- Temperature of <50 - limits growth; > 96 - leaf burn and; > 100 & no moisture- halt growth and may cause shoot death.
- Moisture: 28% (v/v)-OK; <15 v/v- no growth
- Grass weeds