Tef Improvement Project (by Zerihun Tadele)

December 17, 2018

Research

- 1. *Mutagenized population*: About 2500 M2 mutagenized populations were generated from recently released tef variety called Dagim. Screening for diverse traits of importance will soon be carried-out using conventional and modern techniques.
- 2. Candidate tef lines: Tef lines tolerant to lodging, acid soil and soil salinity tolerant: candidate lines obtained from these screening have been sent to EIAR for crossing to high-yielding and locally adapted cultivars.
- 3. *Basic studies*: the mechanism of drought and waterlogging of selected tef lines is being investigated by two master students in the group. The evolution of tef and the possibility of transferring useful traits from wild related species to tef has been studied by another master students.
- 4. *Breeding and variety release*: candidate lines for selected traits have been hybridized to improved cultivars and the progenies have been evaluated at multiplication in Ethiopia. In addition to the release of the first lodging tolerant *Tesfa* variety in 2017, two new varieties are in the pipeline to be released in mid- 2019.

Other developments

- 1. SNIS project: comments to pre-proposal (Associate member)
- 2. SDC project: city region food system (Advisor to the Ethiopian Project)
- 3. DuPont Pioneer tef workshop by Jim Gaffeny: February 21-22, 2019 in Addis Ababa & Debre Zeit
- 4. SFIAR (Swiss Forum for International Agricultural Research). At the SFIAR members meeting in Bern on December 10, 2018, I discussed with Michel Evequoz, SDC representative to CGIAR, about the importance of orphan crops and the need for scientific research on these largely neglected crops. Based on the suggestion of ME, I wrote email explaining the need for funding orphan crops.

Participation at international conferences in 2018

Title of the presentation	Date	Conference name and venue
Role of African Scientific Diaspora:	16.09.2018	Linking African Agriculture, Ghent
Opportunities & Challenges	10.09.2016	(Keynote speaker)
Orphan Crops Improvement: the Need for	06.09.2018	Food for Future Conference,
Concerted Efforts		Cologne
Food Security and the Future of Plant	06.09.2018	Panelist, Podium discussion,
Breeding		Cologne
adains and Draught Registert Tef 21.09.2019	31.08.2018	Scientific Innovation in African
Lodging and Drought Resistant Tef	31.06.2016	Agriculture, Ghent
Application of Mutation Breeding to the	28.08.2018	International Mutation Breeding
Improvement of Understudied Crop Tef		Symposium, Vienna
Discussion on Tef value-chain 13.0	13.06.2018	Stakeholders meeting at Debre Zeit,
	13.00.2016	Ethiopia (Moderator)

Publications in 2018

- 1. **Tadele Z. 2019**. Challenges of food security for orphan crops. In: Ferranti P, Berry EM, Anderson JR. (Eds.), *Encyclopedia of Food Security and Sustainability* 1: 403-408.
- 2. Girma D, Cannarozzi G, Weichert A, **Tadele Z**. **2018**. Genotyping by sequencing reasserts the close relationship between tef and its putative wild Eragrostis progenitors. *Diversity* 10(2):17.
- 3. Martinelli F, Cannarozzi G, Balan B, Siegrist F, Weichert A, Blösch R, **Tadele Z**. **2018**. Identification of miRNAs linked with the drought response of tef [*Eragrostis tef* (Zucc.) Trotter]. *Journal of Plant Physiology* 224-225: 163-172.
- 4. Cannarozzi G, Weichert A, Schnell M, Ruiz C, Bossard S, Blösch R, Plaza-Wüthrich S, Chanyalew S, Assefa K, **Tadele Z**. **2018**. Waterlogging affects plant morphology and the expression of key genes in tef (*Eragrostis tef*). *Plant Direct* 2018:1-22.
- 5. Cannarozzi G, Chanyalew S, Assefa K, Bekele A, Blösch R, Weichert A, Klauser D, Plaza-Wüthrich S, Esfeld K, Jöst M, Rindisbacher A, Jifar H, Johnson-Chadwick V, Abate E, Wang W, Kamies R, Husein N, Kebede W, Tolosa K, Genet Y, Gebremeskel K, Ferede B, Mekbib F, Martinelli F, Pedersen HS, Rafudeen S, Hussein S, Tamiru M, Nakayama N, Robinson M, Barker I, Zeeman S, **Tadele Z**. **2018**. Technology generation to dissemination: lessons learned from the tef improvement project. *Euphytica* 214(2):31.
- 6. Tadesse L, Mekbib F, Wakjira A, **Tadele Z**. **2018**. Genetic diversity in the Ethiopian garden cress (*Lepidium sativum* L.) using microsatellite markers. Current Plant Biology. In press. 10.1016/j.cpb.2018.11.007
- 7. Tadesse L, Mekbib F, Wakjira A, **Tadele Z. 2018**. Multivariate analysis of genetic diversity in the Ethiopian garden cress (*Lepidium sativum* L.) Genotypes. *Journal of Experimental Agriculture International* 27(3): 1-16.
- 8. Tadesse L, Mekbib F, Wakjira A, **Tadele Z. 2018**. Correlation and path coefficient analysis of yield and quality components of garden cress (*Lepidium sativum* L.) genotypes in Ethiopia. *Journal of Plant Breeding and Crop Science* 10(10): 290-297.
- 9. Jifar H, Dagne K, Tesfaye K, Assefa K, **Tadele Z. 2018**. Agro-morphological traits diversity in tef [*Eragrostis tef* (Zucc.) Trotter] genotypes from various sources. *Ethiopian Journal of Agricultural Sciences* 28(3):131-148.
- 10. Tadesse L, Mekbib F, Wakjira A, **Tadele Z. 2018**. Genetic diversity of seed storage protein in the Ethiopian garden cress (*Lepidium sativum* L.). *African Journal of Biotechnology* 17(37):1152-1161.
- **11. Tadele Z. 2018.** African orphan crops under abiotic stresses: challenges and opportunities. *Scientifica* 2018:1-19.
- 12. Kebede W, Tolossa K, Hussein N, Fikre T, Genet Y, Bekele A, Gebremeskel K, Fentahun A, Daba H, Plaza-Wüthrich S, Blösch Regula, Chanyalew S, Asefa K, **Tadele Z. 2018**. Tef (*Eragrostis tef*) Variety 'Tesfa'. *Ethiopian Journal of Agricultural Sciences* 28(2): 107-112.
- 13. Ferede B, Mekbib F, Assefa K, Chanyalew S, Abraha E, **Tadele Z. 2018**. Evaluation of tef (*Eragrostis tef*) somaclones for drought tolerance. *Advances in Crop Science and Technology* 6(4): 385.
- 14. Jörin J, Assefa K, Krütli P, Ben-Abderrazi K, Hauenstein S, Messmer L, Lulseged T, Dawoe E, **Tadele Z**, Six J. **2018**. *Resilience of the Tef Value Chain in Ethiopia*. ETH Zurich, Switzerland (in English and Amharic).

Scientific contribution: Guest Editor of Planta Journal; Book Editor on Grasses (Intech)

Tef Pelleting training and optimization by Benny Brämberg

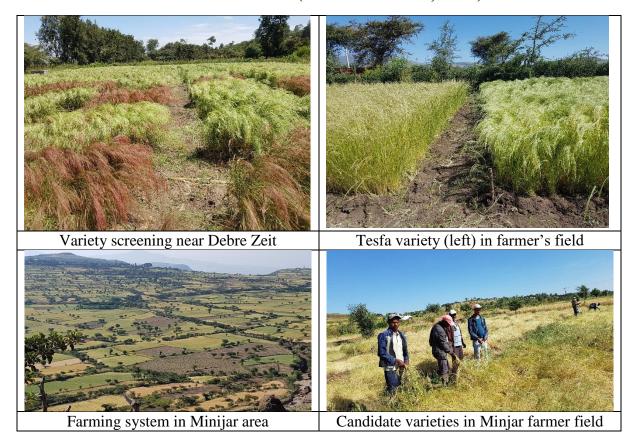
(01.10.2018 - 05.10.2018)



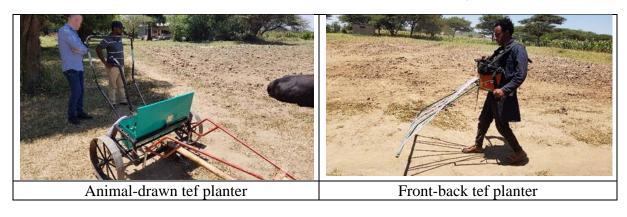
Investigating pelleted and dried seeds

Sieving dried seeds

Visits to tef fields (October 4 and 5, 2018)



Visits to Melkassa mechanization (October 5, 2018)



Visit to Chefe Donsa area, Gimbichu District (28.11.2018)



Farmer's field, Kersa community, Chefe Donsa, Gimbichu



Chefe Donsa sub-station, under Debre Zeit Agric. Research Center, EIAR