

REPORT: Visit to Ethiopia



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1. Introduction

Profs Karen Theron and Wiehann Steyn as well as Dr Esmé Louw were invited to attend a workshop on apple growing under conditions of insufficient chilling held in Addis Ababa on 10 October 2017. The workshop was organised by Prof Wannes Keulemans of the Catholic University of Leuven in Belgium and Dr Getachew Alemayehu of Bahir Dar University in Ethiopia.

2. Objectives of the visit:

The objectives of the visit were to establish a potential collaboration with researchers in Ethiopia on dormancy and to assess apple production in Ethiopia.

3. Workshop on Apple growing under conditions of insufficient chilling.

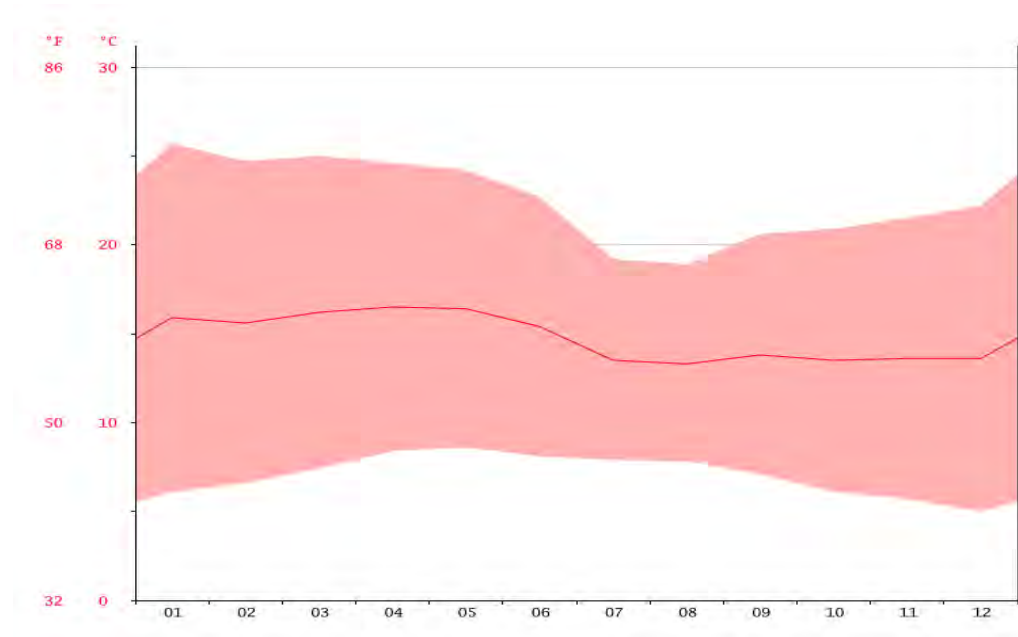
Date	10 October 2017
Organiser	Prof Wannes Keulemans of KU Leuven (Belgium) and Dr Getachew Alemayehu of Bahir Dar University (Ethiopia)
RSA participants	Karen Theron, Esmé Louw and Wiehann Steyn
Delegates	- Prof Wannes Keulemans, KU Leuven - https://www.biw.kuleuven.be/biosyst/plantenbiotechniek - Dr Getachew Alemayehu, Ms. Yemisrach Belay (PhD student), and Dr Zerihun Nigussie, Bahir Dar University - http://www.bdu.edu.et/caes/?q=content/horticulture - Dr Getachew Hruy, Mekelle University - http://www.mu.edu.et/index.php/department-of-dryland-crop-and-horticulture-science - Drs Kebede Jobir, Guchie Gulie, Fassil Teffera, and Mr Seifu Fetena, Arbaminch University - http://www.amu.edu.et/index.php?option=com_content&view=article&id=37&Itemid=42 - Mr Fred Den Boef, apple grower in Debre Berhan - Mr Abiye Astatike, apple grower in Debre Berhan - Messrs Andinet Meaza and Gedewon Pawulos, Highland Harvesters - http://highlandharvesters.com/about.html - Mr Habtamu Setu, Holeta Research Center - http://www.eiar.gov.et/index.php/holeta-agricultural-research-center
Workshop summary	- Ms Belay's study involve growing GD and RG in Ethiopia (low chill) and Belgium (high chill) and then comparing differential gene expression during bud development, bud break and flowering. - Prof Keulemans indicated that the typical delayed foliation symptoms are observed in Ethiopia. - Dr Hruy's PhD study investigated tree architecture in an apple progeny in Ethiopia and Belgium. - Dr Alemayehu indicated that apple production became a recent focus of various food security initiatives undertaken by NGOs and government. However, there are several difficulties experienced with apple production on the Ethiopian highlands including poor agronomic practices, lack of technical expertise, support, infrastructure and market development. - Mr Astatike's farm receives about 600 Richardson chill units. Since trees are not irrigated, defoliation occurs during the dry season. Two, poor quality crops are achieved per annum with low chill cultivars whereas a single crop in June is achieved with medium chill cultivars and trees are dormant from August to March during the dry season. - According to Mr Fetena, average yields in the southern Chench district is 4-8 t/ha.



Apple production areas in Ethiopia.

4. Visit to apple production sites in and around Debre Tabor.

Host	Dr Getachew Alemayehu of Bahir Dar University.
Debre Tabor	Latitude 11°51'N at an elevation of 2,700 m above sea level.
Observations	• Not a formal industry. • Subsistence farming with the Orthodox Church mainly producing and supplying farmers with trees. • Very little management of trees. • Absence of irrigation results in defoliation in the dry season (Jan-Feb). Trees sprout with onset of rain in Mar and produce a crop in June. Trees again flowers in Oct with a crop in Dec. • Higher chill accumulation in other regions such as Debre Birhan (Chencha) might allow for a normal cropping cycle, if trees could be irrigated during the dry season and with the use of rest breaking agents.



Average annual temperature – Debre Tabor

(Source: <https://en.climate-data.org/africa/ethiopia/amhara/debre-tabor-54431/>).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Avg. T (°C)	15.9	15.6	16.2	16.5	16.4	15.4	13.5	13.3	13.8	13.5	13.6	13.6
Min. T (°C)	6.1	6.6	7.4	8.4	8.6	8.1	7.9	7.8	7.1	6.1	5.7	5
Max. T (°C)	25.7	24.7	25	24.6	24.2	22.7	19.2	18.9	20.6	20.9	21.5	22.2
Rain (mm)	9	9	30	37	87	165	432	429	175	79	33	12

Monthly average temperatures and rainfall at Debre Tabor, Ethiopia. Note that the average temperature varies by 3.2 °C during the year.

(Source: <https://en.climate-data.org/africa/ethiopia/amhara/debre-tabor-54431/>)



Typical apple orchards.



Apple nursery with rooted layers and a “bud park” run by the church.



10-year-old apple tree blooming for the second time during 2017.

5. Take home lessons

Take home message	Recommendation and action
1. <u>Collaboration</u> Potential for collaboration with Dr Hruy and maybe Dr Alemayehu.	Dr Louw to invite Dr Hruy to South Africa for a reciprocal workshop.
2. <u>Apple production in Ethiopia</u> Wine grapes are of late very successfully produced near Addis Ababa. It will take much effort to produce apples commercially. Stone fruits such as peach and low chill cherries could fare much better under Ethiopian conditions	None.

Appendix 1

Contacts:

Researchers

- Dr Getachew Alemayehu, Bahir Dar University
- Dr Getachew Hruy, Mekelle University

Appendix 2

ITINERARY PROF W.J STEYN: OCTOBER 2017

09 Oct. 2017: Depart Cape Town. Arrive Addis Ababa 22:20.

10 Oct. 2017: Attend and present at the 1st Ethiopian Workshop on Dormancy and Apple Growing under Conditions of Insufficient Chilling.

11 Oct. 2017: Depart from Addis Ababa at 11:30. Arrive Bahir Dar at 12:30.

11-12 Oct. 2017: Visit apple research plots at Debre Tabor.

12 Oct. 2017: Depart from Bahar Dar and arrive in Addis Ababa at 21:25.

13 Oct. 2017: Depart from Addis Ababa at 8:25. Arrive in Cape Town.