



Crops

## Protecting Ethiopian lentil crops

### Overview

In the mid-highlands of Ethiopia, lentils are one of the foundational legume rotation crops for 600,000 households dependent on cereal-based farming systems (wheat, barley and tef).

Lentils are also an important part of the Ethiopian diet, a dietary source of plant-derived protein and a high value cash crop with great cultural importance. Half of the lentil crop is traded at national level. In some zones of Amhara and Oromia, lentils contribute 50-100% of the cash earned by the smallholder growers. This enables the growers to purchase necessary fungicides and fertilisers, pay children's school fees, and buy other less expensive food legumes such as faba bean, field pea and grass pea. Additionally, lentil straw is a highly valued animal feed and can be sold, generating additional income.

The sustainability of the system has recently been threatened by new and emerging viruses and fungal diseases which severely affected crops in 2017-18 and 2018-19 and destroyed the widely grown improved variety, Alemaya, in the central highlands.



### KEY FACTS

**ACIAR Project No.** CROP-2020-164

**Duration:** July 2021 to June 2026 (5 years)

**Target areas:** Amhara and Oromia, Ethiopia

**Budget:** A\$2,140,000

#### Project Leader

Martin Barbetti, University of Western Australia

#### Key partners

- University of Western Australia
- Department of Economic Development, Jobs, Transport and Resources, Victoria (in-kind participant)
- Eritrean Institute of Agricultural Research (in-kind participant)
- Ethiopian Institute of Agricultural Research
- International Centre for Agricultural Research in the Dry Areas
- New South Wales Department of Primary Industries– Tamworth Agricultural Institute.

#### ACIAR Research Program Manager

Dr Eric Huttner

## Objective

**The project aims to protect and increase the productivity of lentil crops in the mid-highlands of Ethiopia so smallholder farmers can maintain and improve their current lentil cropping practices, their cereal crops, and their livelihood.**

It will:

- Identify lentil viruses and root pathogens, map their distribution in different zones and quantify the resulting losses.
- Establish the epidemiology of the most important viruses and soilborne diseases.
- Identify and utilise sources of resistance to these diseases.
- Develop, validate and deploy an integrated management strategy against these diseases.
- Strengthen the lentil crossing/early breeding and pathology programs in Ethiopia through capacity building and through training stakeholders (researchers, extension agents, participating farmers), utilising female-to-female and male-to-male approaches wherever possible and required.

## Expected scientific results

- Knowledge in disease aetiology and epidemiology, supporting effective decisions for both short- and long-term management of lentil diseases.
- Collection of pathogen isolates and associated host resistance traits for comparison with future pathogen population diversity and to monitor changes and variation occurring within these and other pathogen populations elsewhere.
- Knowledge on application of fungicides and/or cultural controls and/or resistant varieties supporting the development of integrated management packages and extension packages for lentil producers.
- Identification of disease-resistant lentil genotypes for providing long-term cost-effective control of these diseases to Ethiopian farmers and elsewhere.

## Expected impact/outcomes

- Increased awareness of the different lentil diseases and their epidemiology and impact, for farmers, extension officers and researchers.
- Enhanced skills of Ethiopian researchers and their organisations in disease aetiology, epidemiology, molecular biology, plant pathology, applied biometry, plant breeding and farming system analysis.
- Improved disease management skills for smallholder farmers confronting lentil disease challenges, helping the farmers to grow more productive, disease-resistant varieties.
- Enhanced profitability of lentils for smallholders, securing family welfare.
- Enhanced capacity of the Australian lentil industry to address future disease issues.
- Improved capacity for lentil farming in other African countries and possibly also in Europe.
- Restored resilience of cereal-based lentil farming systems.

