**Progress Brief Report**

# Analysing the impact of GLDC innovations for managing abiotic and biotic stresses in the agro-ecosystems

January 2019

ICARDA

CGIAR RESEARCH PROGRAM ON Grain Legumes and Dryland Cereals

**Progress Brief Report**

# Analysing the impact of GLDC innovations for managing abiotic and biotic stresses in the agro-ecosystems

Safaa Kumari, Seid-Ahmed Kemal, Mustapha El-Bouhssini
International Center for Agricultural Research in Dry Areas (ICARDA)

DECEMBER 2018

# Table of Contents

## Objectives

- Identify the GLDC innovations adopted by chickpea and lentil farmers
- Impacts of biotic and abiotic constraints on chickpea and lentil

## Methodology

Biotic (diseases and insect pests) survey was done from October 28-Novemeber 2, 2018 in major chickpea and lentil growing zones (North and East Shoa Zones) in Central highlands of Ethiopia. Most of the chickpea and lentil innovations (high yielding and disease resistant chickpea and lentil cultivars and early sowing) were validated and adopted by farmers. However, farmers do not have any innovation for late planted lentil on residual moisture. The survey covered both early and late planted chickpea and lentil.


Figure 1. Photos of fields and survey activities.

## Major findings

- The major biotic stresses observed were:
  - Pod borer on chickpea
  - Green pea aphids on lentil
  - Thrips on lentil
  - Wilt/root rot, Ascochyta blight and rust on chickpea
  - Rust on early planted chickpea
  - Wilt/root rot on lentil
  - Viruses on chickpea and lentil

- Both early and late planted lentil will suffer high yield losses due to aphids, viruses and wilt/root rots
- The major viruses identified on early and late planted lentil and chickpea were *Chickpea chlorotic stunt virus* (CpCSV) and *Beet western yellows virus* (BWYV). Both viruses are persistently transmitted by various aphid species. Also *Pea seed-borne mosaic virus* (PSbMV) was a major seed-borne virus on lentil.

**Innovations used by farmers to manage biotic stresses**

For controlling Insect pests on chickpea and lentil:

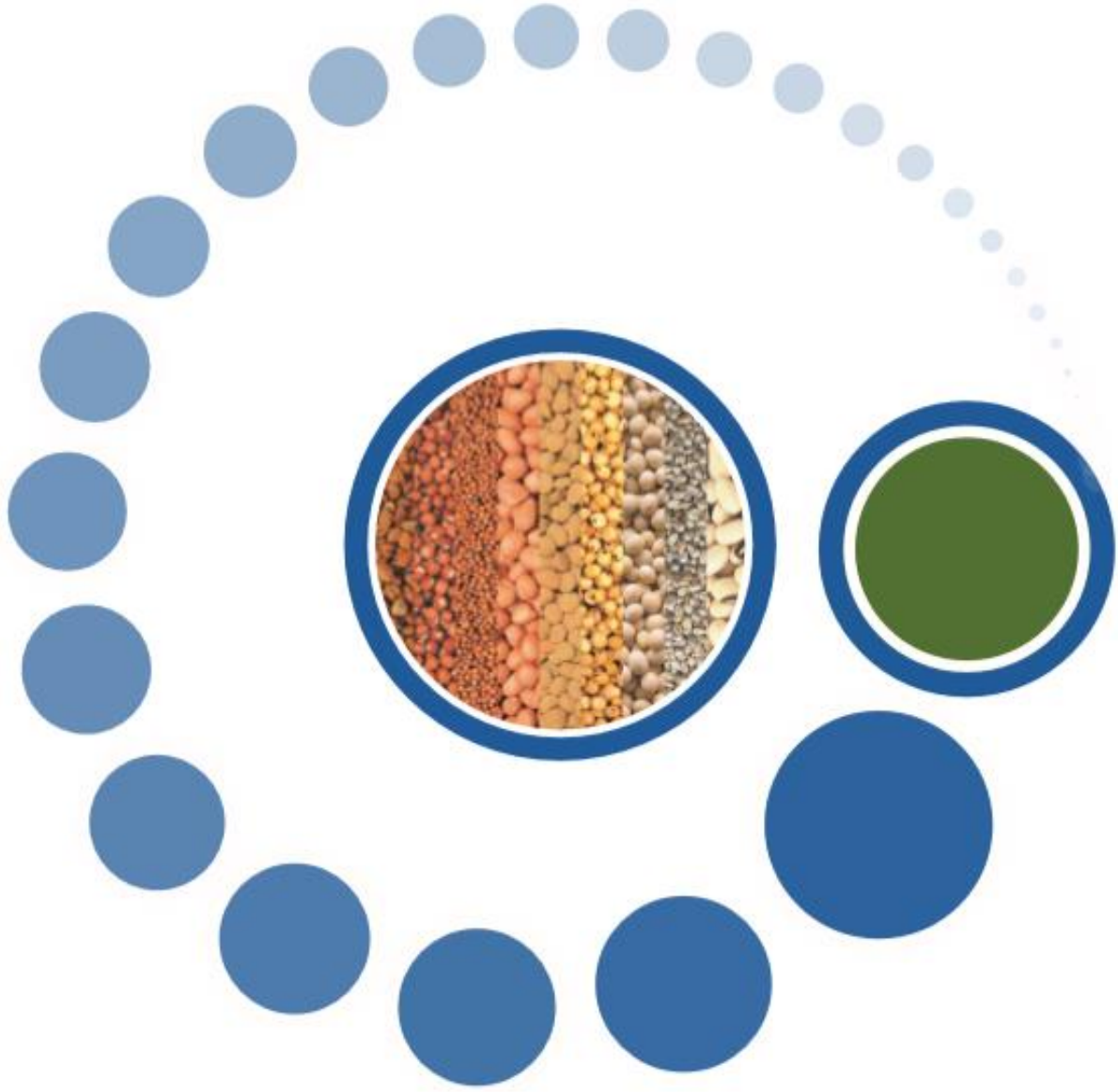
- Uses of insecticides against aphids on lentil and pod borer on chickpea
- Uses of disease resistant chickpea [cvs. Arerti (FLIP 89-84C) and Habru (FLIP 88-42C)] and lentil [(cv. Alemaya (Flip 89-63L)] cultivars

**Innovations used by farmers to manage abiotic stresses**

- Uses of water logging tolerant chickpea and lentil cultivars for early planting using drainage methods (ridge and furrow)
- Early planting to manage terminal moisture stresses

## Conclusion

- New innovations (integrated pest management) should be developed and introduced to manage viruses and their vectors on both crops,
- New sources of virus resistance should be developed for both chickpea and lentil through FP4,
- Research of pesticide efficacy based on insect pest developmental stage needs to be tested since most farmers complained that the pesticide they spayed did not contrail mainly pod borer on chickpea



CGIAR RESEARCH PROGRAM ON Grain Legumes

LED BY ICRISAT

IN PARTNERSHIP WITH CIAT, ICARDA (Science for resilient livelihoods in dry areas), IITA

and public and private institutes and organizations, governments, and farmers worldwide