What is Conservation Agriculture?
Conservation Agriculture is a way of managing agro-ecosystems to achieve higher, sustained productivity, increased profits and food security while enhancing the environment. This is achieved through improved management and application of three key principles.
These are:
1. Minimum soil disturbance: In CA, crops are planted directly into unploughed soils. Minimal disturbance of the soil allows the retention of soil organic matter, which is lost through CP. Less moisture is lost through evaporation and more carbon is sequestered in the soil than happens in a conventionally ploughed field;
2. Permanent soil cover: Covering the soil protects it from the physical impact of rain and wind and helps retain soil moisture and stabilize soil temperature in the surface layers. Water retention and infiltration is improved, as is the suppression of pathogens and weeds.
3. Diversified crop associations and rotations: Growing crops in mixtures or rotations helps to control pests and diseases by breaking their cycles and improve soil fertility.

Introduction
Farming systems in Ethiopia Somali region are constrained by numerous factors, including inherently infertile sandy soils in some areas, limited access to, and use of, mineral and organic fertilizers and drought. The rainfall distribution patterns during the growing season in region are characterized by mid-season dry spells. Significant yield benefits under Conservation agriculture (CA) are possible in the region.

On-farm and on-station trials were conducted in Jigjiga and Gursum to compare CA with the current smallholder conventional practice (CP) for productivity of maize-bean cropping systems. Research results showed maize-bean intercropping and rotation improved crop productivity and soil properties in the study area.
How can Farmers practice Conservation Agriculture?

1. Minimum soil disturbance
   ⇒ Apply glyphosate (round up) at the rate of 2.5–3.0 lit ha\(^{-1}\) depending on weed density and type at 2 weeks before planting, and then manually control the weed as needed.
   ⇒ Use one-pass oxen plough with “maresha” or hand-hoe or planting stick. Planting time should be between end of April and mid May (E.C) depending on onset of rainfall. Intercrop bean can either be planted with maize or two weeks later depending on onset of rainfall. (Spacing: 75 x 25 cm for maize (e.g. Melkassa-II) and 40 x 10 cm for haricot bean (e.g. Nassir and Awash-I), and the 10 cm intra-row spacing can be used for intercrop common bean.). Fertilizer is not applied to intercropped bean.
   ⇒ Rotation bean can be plant onset of rain fall (Spacing: 40 x 10 cm for haricot bean (e.g. Nassir and Awash-I), and the 10 cm intra-row spacing can be used for intercrop common bean.) 100 kg DAP ha\(^{-1}\) side dressed at planting time.

2. Crop Residue Management
   ⇒ Crop residue should be retain 30% maize and 100% of common bean residue after each season harvest of the common bean-maize intercropping and rotation system. The remaining maize residue can be used to feed livestock.

3. Diversified crop associations and rotations
   ⇒ Intercrop bean can either be planted with maize or two weeks later depending on onset of rainfall. (Spacing: plant between canter of maize row and the 10 cm intra-row spacing can be used for intercrop common bean.). Fertilizer is not applied to intercropped bean.
   ⇒ Rotation bean can be plant onset of rain fall (Spacing: 40 x 10 cm for haricot bean (e.g. Nassir and Awash-I), and the 10 cm intra-row spacing can be used for intercrop common bean.) 100 kg DAP ha\(^{-1}\) side dressed at planting time.

Benefit of CA in Maize Haricot Bean System
1) Improved crop productivity
2) Reduced soil degradation.
3) Reduced cost of production

Benefit of common bean in the System
1) Early maturing and can scape drought due to early cessation of rainfall.
2) Intercropped bean could be an insurance crop to farmers in bad seasons.
3) Increase soil fertility and increase yield of succeeding maize crop when used as precursor crop in rotation.
4) Cash crop and fetch higher prices than maize in the region.