

## Winter chickpea - improving rural livelihoods The impact of improved varieties and technologies in Syria

In partnership with the Syrian national program, ICARDA's research on winter chickpea has made important contributions to household economies

- *Growing winter chickpea varieties with improved farming practices is more profitable than traditional spring-sown chickpea, increasing household incomes especially among poorer farmers.*
- *Adoption of winter chickpea increases the water productivity, i.e. 'more crop per drop' of rainfall.*
- *Winter chickpea production increases labor demand, mainly for weed control, offering more employment opportunities.*

After lentil, chickpea is the most important rainfed pulse crop in Syria by area planted, with 77,000 hectares sown each year. Chickpea was traditionally planted in the spring, part of a two or three crop rotation using the remaining soil moisture following winter rains, however, yields are often low, due to frequent droughts.



Winter chickpea trials show the benefits of new varieties



A farmer shows off his winter chickpea during a field day in Idleb

Winter chickpea can double yields compared to spring chickpea. However, farmers in Syria and other winter rainfall areas in North Africa, West and Central Asia avoid winter sowing because of high risks of crop loss, mainly from the fungal disease *Ascochyta* blight, but also from frost damage during severe winters.

But, in 1982, 'Ghab 1' was developed by ICARDA, the first variety with resistance to *Ascochyta* blight and improved cold tolerance. Four more winter sowing varieties followed (Ghab 2, 3, 4 and 5), released by the Syrian Ministry of Agriculture and Agrarian Reform, the latter two also producing larger seeds, released in 2002. These promised yield stability and economic advantages to smallholder farmers, and seed was distributed along with the agronomic advice of using a lower seed rate, early planting, seed treatment, and fungal disease and weed control.

The Syrian Department of Agricultural Extension and the General Commission of Scientific Agricultural Research (GCSAR) have been promoting winter chickpea technologies in partnership with ICARDA. Field days were organized and seeds distributed to farmers. The impact on rural livelihoods, food security and labor opportunities were assessed by interviewing 470 farmer households in Aleppo, Idleb, Hama, and Dara'a provinces in 2006.

### Adoption of winter chickpea varieties

The percentage of farmers adopting winter chickpea (the adoption rate) was 64% in the wetter Zone 1 (>350 mm mean annual rainfall) and 73% in the drier Zone 2 (250-350 mm). Adoption was greatest in Aleppo province (75%), followed by Idleb and Hama (65%) and lowest in Dara'a (44%). The average adoption rate and area planted to winter chickpea were both 66%, although the wealthiest quarter of farmers were more likely to adopt winter chickpea varieties (74%) than the poorest quarter (57%). Farmers observed that the most important factors affecting the productivity were still *Ascochyta* blight, pests, diseases and weeds, but that the characteristics of winter chickpea were generally better than spring chickpea, though there were issues with the smaller grain size, seed color, and the lower market price received.

## Adoption of winter chickpea technologies

Farmers were provided with the option of adopting the full technological package, or selecting any of the individual components. Most farmers adopted only one or a few technologies, and only three farmers adopted the full package. More than half of the farmers adopted the recommended planting date, seed treatment, fungal disease and weed control (Figure 1).

## Impact of winter chickpea

**On productivity:** Adoption of winter chickpea varieties increased crop productivity, and farmers who adopted at least some components of the technological package had higher yields compared to non-adopters during good, normal, and dry years (Figure 2). Shifting to winter chickpea gave an average yield increase of 32% in the wetter Zone 1 and 18% in the drier Zone 2.

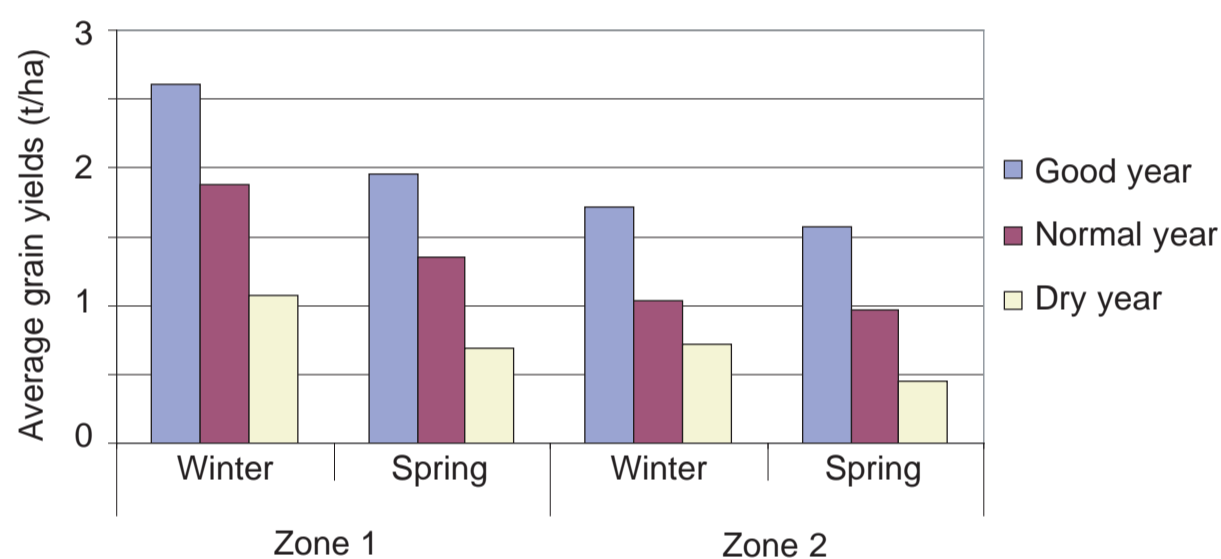


Fig. 2. Estimated average chickpea yields in good, normal and dry seasons

**On labor requirement:** Winter chickpea increased labor requirements in both zones, mostly for manual weeding, thus increasing the opportunities for increased employment, especially amongst women who usually conduct this operation.

**On water productivity:** On average, each 1 mm of rainfall produced 4.8 kg of winter chickpea compared to 3.6 kg of spring chickpea, and water productivity was higher in all districts surveyed.

## Implications

Policy implications arising from this work suggest that more efforts to further promote the adoption of winter chickpea production by the National Agriculture Extension Directorate, would have immediate impacts in improving rural livelihoods in Syria. Also, this model should be outscaled to other countries in the region.

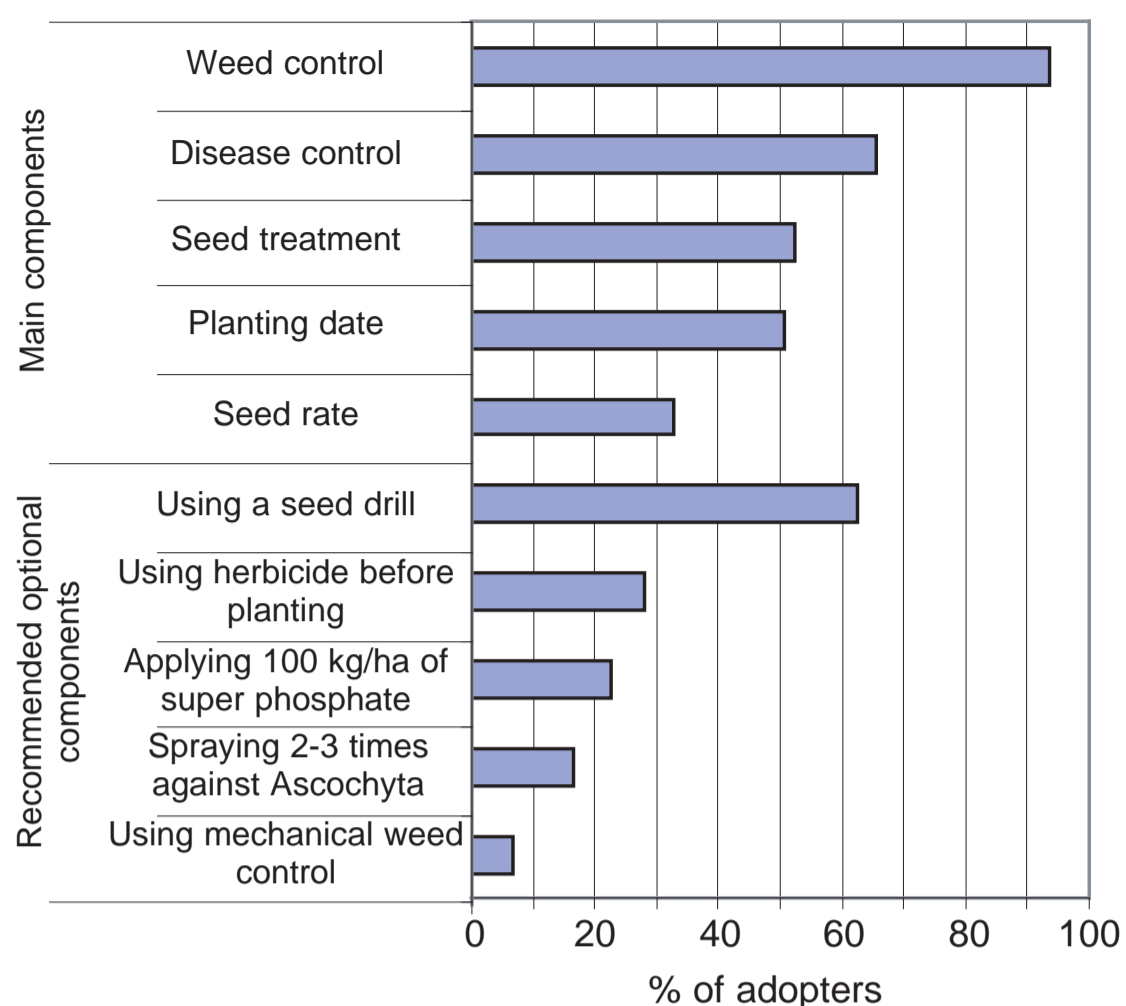


Fig. 1. Farmer adoption of winter chickpea technologies

**On profitability:** Growing winter chickpea increased estimated net revenue by over US\$200 per hectare. Both wealthy and poor farmers increased their net revenues from winter chickpea over spring chickpea, indicating that the varieties and technologies were appropriate for all income classes.

**On household income:** Average annual household income was US\$13,900, of which chickpea production contributed over one fifth (Figure 3), and this was mostly from winter chickpea (14%) rather than spring chickpea (6%).

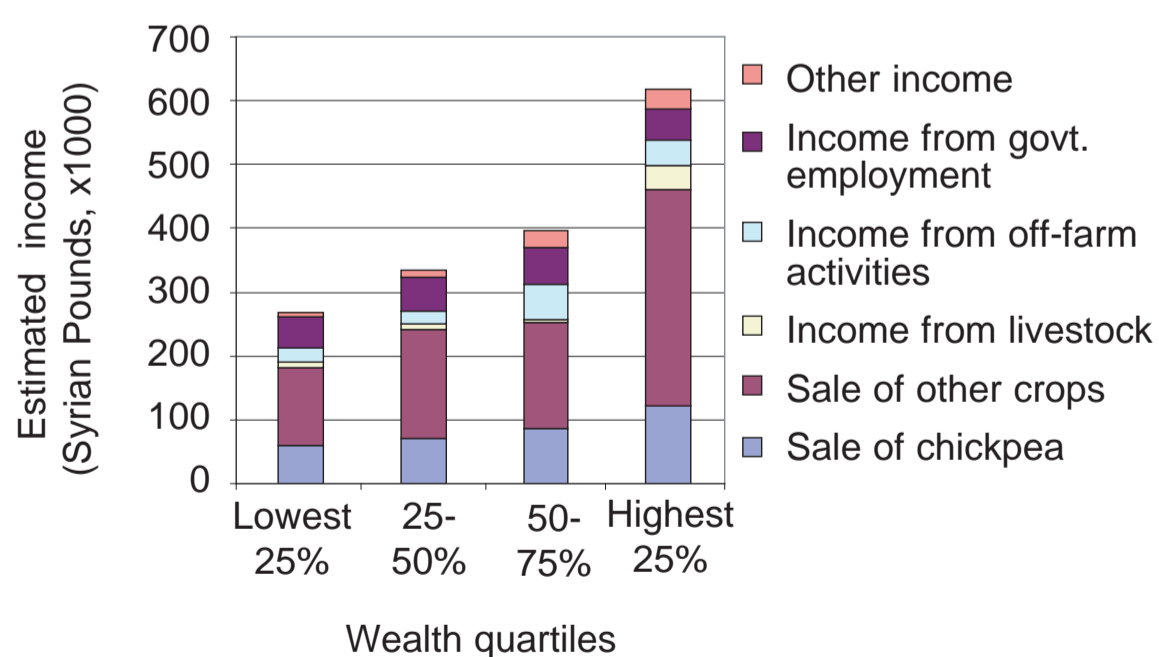


Fig. 3. Average annual household income by wealth quartiles