

Sustainable Agriculture Vision

Sustainable agriculture offers an entirely different approach to agricultural development from that of the green revolution or the “gene” revolution.

It encourages development within agricultural systems, in order to minimize if not totally eliminate non-renewable external inputs, such as chemical fertilisers and pesticides, in agricultural production.

The technologies and practices that are utilised attempt to mimic natural ecosystems, such as traditional shifting cultivation, multiple-cropping systems, etc – and are based on care for the soil and a broad use of biodiversity

Sustainable agriculture is also based on the principle of equity, on rootedness in culture, and encompassing all aspects of local livelihoods. It is not merely a way of doing agriculture without chemicals. It is a way of life – embedded in respect for agro and other ecosystems inherited from past generations and held in trust for future ones.

In this vision, indigenous knowledge systems and biodiversity are the foundations of sustainable seed systems and farmers are active plant breeders, conservationists and crop improvers

Scientists work alongside farmers to strengthen and support their strategies for agricultural production. In this manner, plant breeding can enhance genetic diversity and develop varieties specific to local needs and to the local culture and agroecology.

Impact of compost on yields

- Sampling technique (FAO method for monitoring food security)
- Samples were taken with the farmers.
- Fields were selected and 3 one-metre square plots were cut and threshed, and the straw and grain weighed with the farmers.

10 Birr is equivalent to 1 Euro, or 15 Birr equals 1 £

Table 1: Grain yields (in kg/ha), expenses and returns (in Birr) for Adi Gua'edad in 2003 (1st year)

Crop	Input	Yield	Gross income	Fertilizer cost	Net income
Faba Bean	Compost	2900	8700	0	8700
	Fertilizer	1100	3300	377	2923
	Check	766	2298	0	2298
Finger Millet	Compost	2000	3400	0	3400
	Fertilizer	1433	2436	377	2059
	Check	500	850	0	850
Maize	Compost	2000	3200	0	3200
	Fertilizer	1133	1813	377	1436
	Check	680	1088	0	1088

Table 1: continued

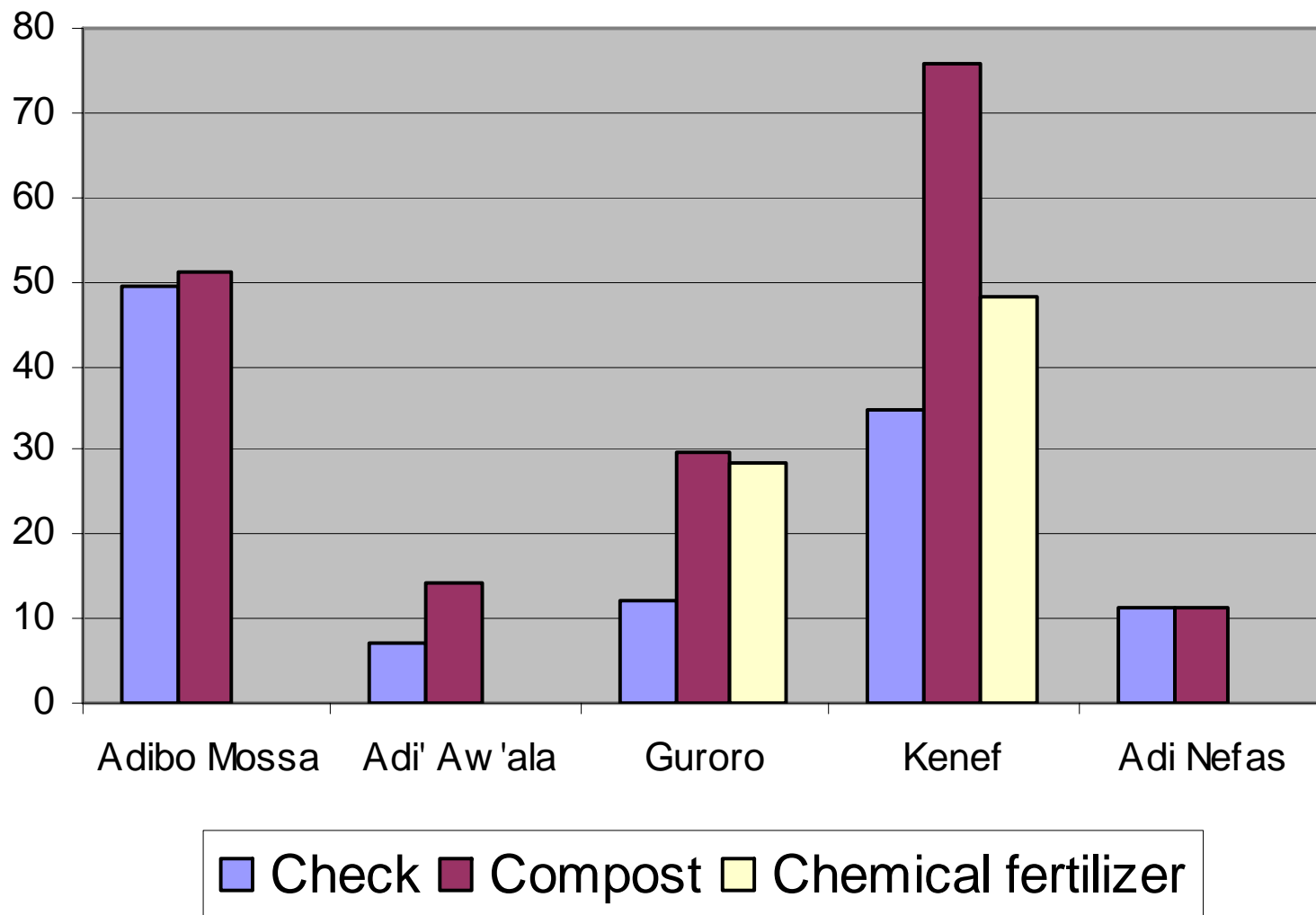
Crop	Input	Yield	Gross income	Fertilizer cost	Net income
Barley	Compost	2193	4386	0	4386
	Fertilizer	1283	2566	377	2189
	Check	900	1800	0	1800
Wheat	Compost	1020	2550	0	2550
	Fertilizer	1617	4043	377	3666
	Check	590	1475	0	1475
Teff	Compost	1650	4620	0	4620
	Fertilizer	1150	3220	377	2843
	Check	390	1092	0	1092

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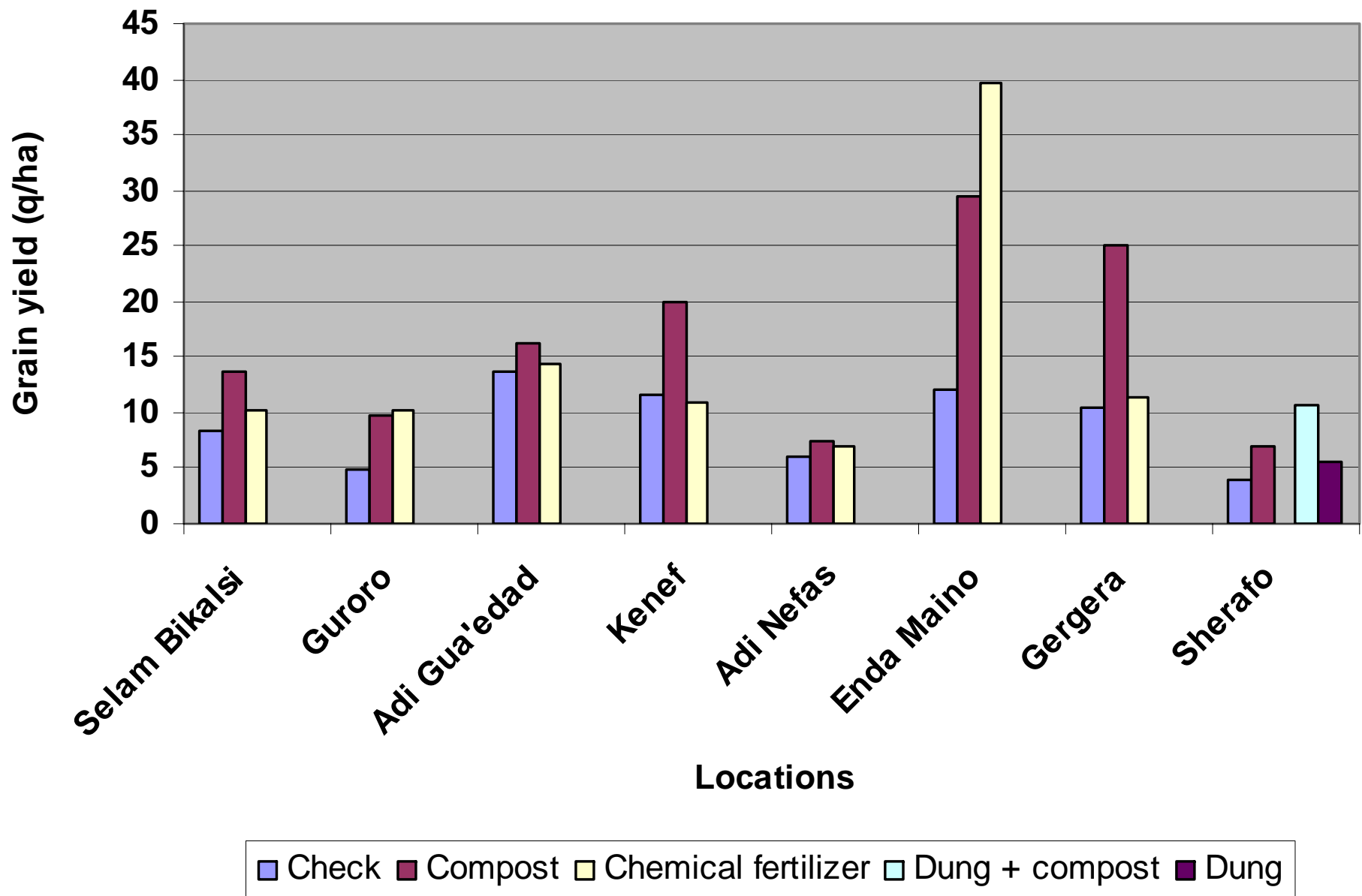
Table 2: Grain yields (in kg/ha), expenses and returns (in Birr) for Adi Nefas in 2003 (7 years)

Crop	Input	Yield	Gross income	Fertilizer cost	Net income
Faba Bean	Compost	4391	13173	0	13173
	Check	2287	6861	0	6861
Finger Millet	Compost	2650	4505	0	4505
	Check	833	1416	0	1416
Maize	Compost	5480	8768	0	8768
	Check	708	1133	0	1133
Teff	Compost	1384	3875	0	3875
	Fertilizer	1033	2892	377	2515
	Check	739	2069	0	2069
Wheat	Compost	2250	5625	0	5625
	Fertilizer	1480	3700	377	3323
	Check	842	2105	0	2105
Barley	Compost	1633	3266	0	3266
	Check	859	1718	0	1718

Maize yields (q/ha) in 5 locations in 2002 in Tigray

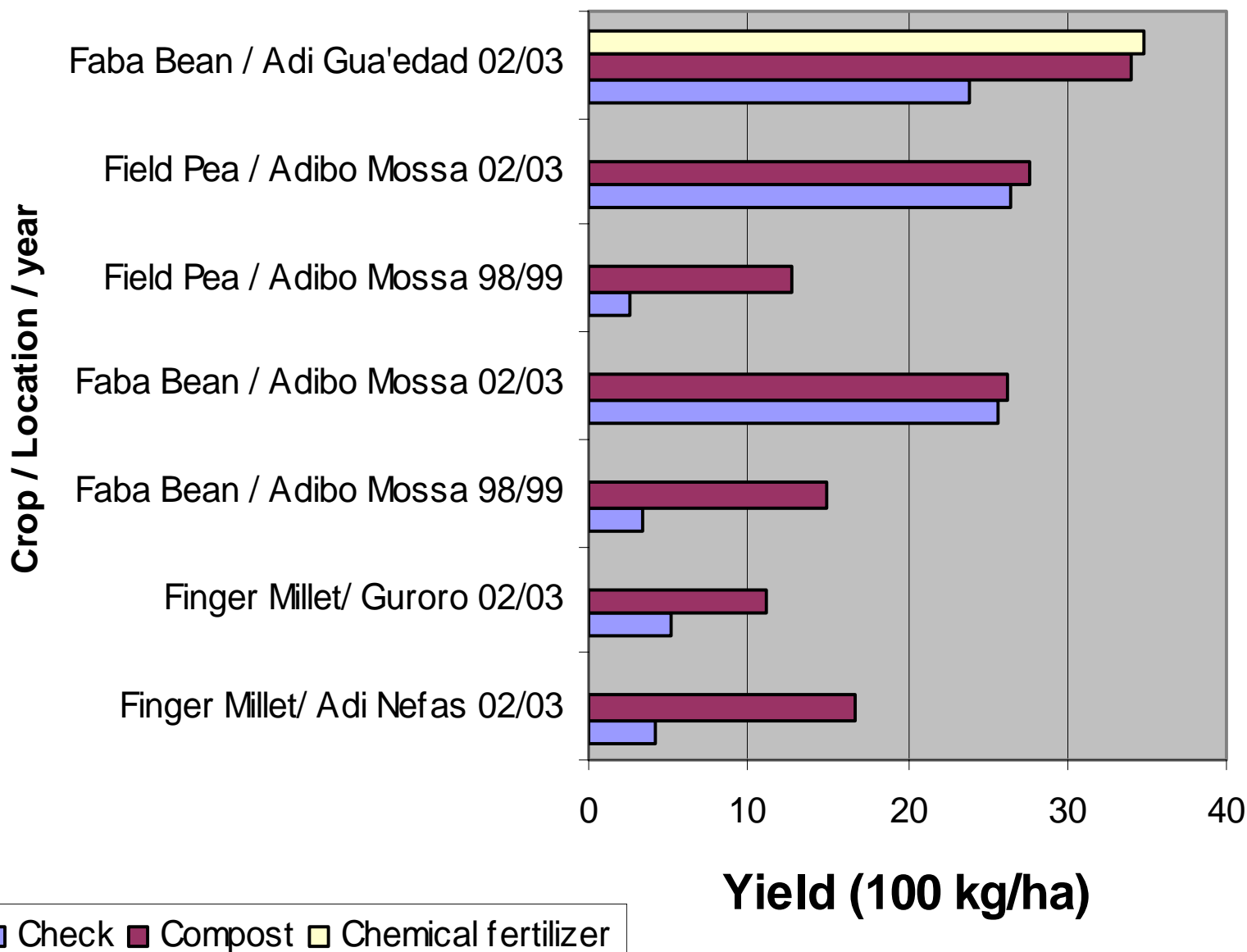


Tef yields (q/ha) in 2002 in Tigray





Yields (100 kg/ha) of finger millet, faba bean and field pea in 98/99 and 02/03, in Tigray



Faba Bean with and without compost



Non composted Faba bean
Akab Se'at, 2003



Composted Fababean
Akab Se'at, 2003

Yields have risen from less than 500 kg/ha on non-compost treated fields to around 2,500 kg/ha when compost is applied.

Adi Nefas

All the components being used in October 2003



Indicators of Sustainability

- Maintaining or increasing agricultural biodiversity: for example, Ziban Sas was growing only wheat and barley mixed together and a little teff, but now other crops e.g. maize and faba bean, are also grown.
- Reduced weeds: weed seeds, pathogens and insect pests are killed by the high temperature in the compost pits, but earthworms and other useful soil organisms establish well.
- Increased moisture retention capacity of the soil: if rain stops early, crops grown on composted soil resist wilting for about two weeks longer than those grown on soil treated with chemical fertilizer.

- Disease and pest resistance: as seen through the problem of shoot fly on teff and root borer on faba bean in Tahitai Maichew and La'elai Maichew respectively, crops are more disease and pest resistant.
- Residual effect: farmers who have used compost for one or two years can obtain high yields from their crops the next year without applying compost afresh.
- Economic returns: farmers have been able to stop buying chemical fertilizer, but they still get even higher yields.
- Flavour: food is said to taste better.

Ethiopia and Organic Production

- The Government has stated its interest to increase the capacity of farmers to use organic methods of crop production.
- The results of the farmers in Tigray in producing and using compost indicate that the aim for Ethiopia having a substantial number of farmers producing organically could be realized.





Protection and promotion of sustainable livelihoods

- Responding to the catalytic effect of a project, three communities in Tigray, Northern Ethiopia, have developed their respective community statutes by consensus to govern the activities of each member as well as that of the whole community in order to manage the land under the usufruct right of each member and the community so that the whole environment in which the community lives and its productivity are improved sustainably.

- *We, the residents of the village of Adi Nifas, who have the usufruct right over the area around Fengele, and are included in the Sustainable Rural Development Project, have committed ourselves to bring about our own development sustainably.*
- *To promote the carrying out of current and future activities aimed at the growth of sustainable agriculture and to overcome constraints and negative tendencies, we have produced and unanimously agreed to the following statutes.*

1. Concerning Our Benefits:

- *We reiterate that when the aims of the Research Project on Sustainable Rural Development and the modalities of its implementation were explained to us, we understood the benefits it would give us and, because we were convinced of its merits, we accepted it unanimously without any external pressure pushing us into doing so, and we demarcated our land for its implementation.*
- *We shall, on a continuing basis, construct and maintain physical structures to prevent soil erosion in our farmlands and our uncultivated areas and to stop gullyng so as to prevent the worsening of land degradation and harm to us. We shall strengthen the physical structures by supplementing them with biological measures.*

- *To this effect, we have hereby established a Committee consisting of 7 of our members representing farmers, the youth and women, as well as [ex-officio] the Tabia Chairman, Village Chairman and Village agricultural specialist [an elected farmer given some modern training]. This Committee shall regulate our activities, approach on our behalf the appropriate authorities in relation to our problems and help us solve those problems. The Committee shall consist of:*
 - *Abraha Gebre Michael — farmer*
 - *Ambaye Habte Mariam — Farmer*
 - *Berhane Abraha — Youth*
 - *Desta Gebre Selasie — Farmer*
 - *Gebre Mariam Gebre Michael — farmer*
 - *Kahsay Gebre Selassie — Village agricultural specialists, and chairing the Committee*
 - *Kidane Taweke — Youth*
 - *Reverend Abebe Gebre Mariam — Village Chairman*
 - *Tsige Gebre Abzgi — Women's Association*
 - *Wolde Michael Dirar — Tabia Chairman*
- *We undertake to do all we can to carry out activities convincingly introduced to us to implement these commitments we have entered into.*

2. Action to Be Taken against any one Who Rejects his Benefits and Is Destructive

- *Anyone who, deliberately or through negligence, grazes his animals in a closed off area, shall pay the penalty of:*
 - *1 Birr [US \$ 0.15] for the first offence*
 - *2 Birr for the 2nd offence*
- *Anyone who does not fence off trees and grass that are around his house, his farm, or gullies and does not look after them and care for them is a hindrance to development. ...*