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Canadian Foodgrains Bank
A Christian Response to Hunger

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Using Farmers as Trainers

In our September 2015 CA Newsletter we discussed effective participatory extension approaches. In this issue we want to discuss in a bit more detail the approach of using farmers as trainers.

Lead Farmer, Monica Mudenda, trains CA farmers in Zimbabwe (Photo by KMTC)

Farmer-trainers are called by various names including "lead farmers," "contact farmers," "model farmers," "community facilitators," "animators," etc. We strongly encourage projects to consider using farmer-trainers as they expand their CA outreach. Why is there such interest in using farmers as trainers?

Development projects are increasingly using farmers as trainers because:

- They are an efficient method of reaching a wider audience
- Their credibility with other farmers is very high
- Serving as farmer-trainers empowers farmers with leadership skills
- Their sustainability is high since they will remain in the community after the project ends

How are farmer-trainers selected?

Farmer trainers are usually selected by the community together with project staff. They should be selected based on set guidelines including:

- Demonstrated skill as farmers and CA adopters/adapters
- Availability and willingness to train others
- Acceptability by the local community
- Communication skills, usually including literacy

What are the roles of a Farmer-Trainer?

Their main role is to train other farmers. They may do this through one-on-one, hands-on training, or they may teach larger groups with a more formal curriculum provided by the project. Either way, it's very important that farmer-trainers make regular follow-up visits to encourage the farmers they support and to answer questions. Other duties of a farmer-trainer may include keeping records, organizing field days and managing demonstration plots.

Farmer-trainers should be trained to support other farmers on technical subjects including conservation agriculture, soil fertility, pest management, grain storage, etc. They should also receive training on extension/facilitation methods and working with groups. They should receive regular support visits from field staff, and should be included in exchange visits to other projects.

Should farmer trainers be compensated?

Some projects provide an allowance or salary to farmer-trainers to compensate for the time that this farmer commits themselves to be of service. Some provide materials to carry out their duties like bicycles, inputs for demonstration fields, note books, t-shirts, hats, etc. Other projects do not provide any form of compensation. The major challenge with providing incentives is that farmer-trainers often reduce their level of service when the project ends. On the other hand, since they remain as leaders in the community, their presence is more sustainable than field staff hired from outside. Sometimes conflicts arise when some projects provide incentives whilst other projects operating in the same community don't. It is therefore important for projects to coordinate with other local players.

What is your view with regards to payment of farmer-trainers? We can continue this discussion on our Facebook page: https://www.facebook.com/groups/CAinAfrica/?fref=ts

How many farmers can a farmer-trainer serve?

Farmer-trainers who receive no compensation typically serve only 4-5 farmers in their own neighbourhood. Farmer-trainers who receive compensation often work with larger groups of 10 or more farmers. As with any extension staff, farmer-trainers should only be expected to reach out to the number of farmers which they can effectively visit and follow up with.

For some perspectives from organizations that implement farmer to farmer approaches in Malawi and Kenya go to: http://www.worldagroforestry.org/downloads/Publications/PDFS/WP14391.pdf and http://www.worldagroforestry.org/downloads/Publications/PDFS/WP14380.pdf

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Optimum Plant Spacing and Population

To achieve maximum yields, farmers need to plant using optimum spacing between plants. When crops are planted at too wide a spacing, each plant may produce well, but the yield per unit of land will be relatively low. In contrast, when plants are too close together, they compete unduly for light, water and nutrients, and yields again suffer.

Most crop plants are able to adjust to a fairly wide range of planting densities. Some of the best examples of this phenomenon, known as compensation, are the small grain cereals like rice, which when planted at a wide spacing can produce up to 50 fertile seed heads from just one seed. Crops like common beans, sorghum, and millet also compensate by producing fewer branches or tillers when planted closely together, and more tillers when planted far apart. Planting densities for several major crops are listed below:

Recommended Planting Densities for crops grown under favourable and marginal rainfall.[a]

	High rainfall environment				Low rainfall environment			
Crop	**Between rows (cm)**	**Within rows (cm)**	**Plants per hole**	**Density (plants/ha)**	**Between rows (cm)**	**Within rows (cm)**	**Plants per hole**	**Density (plants/ha)**
Maize	75	50	2	53,000	90	60	2	37,000
Soybean	45	5	1	444,000	45	15	1	148,000
Beans	50	10	1	200,000	50	15	1	133,000
Rice	20	20	2	500,000	30	30	2	222,000
Sorghum	75	30	2	888,000	90	30	2	74,000

[a] These are meant to be general guidelines, not strict rules for planting. From: Fairhurst, T. (ed.) (2012) Handbook for Integrated Soil Fertility Management. Africa Soil Health Consortium, Nairobi.

How to Determine Your Optimum Maize Spacing

Maize plants, unfortunately, are relatively poor at such compensation. Maize can respond to growing conditions by adjusting the size of cobs, or producing double cobs, but it rarely produces multiple fertile shoots like many crops. Since maize plants don't compensate well, farmers need to be extra careful to plant at an optimum spacing and seeding rate.

Identifying the optimum maize spacing is not a simple task. As illustrated in the table on p.3, there is no single formula that can be applied throughout Africa. In short, the more productive an environment maize is planted in, the more closely plants should be spaced. 45,000 plants/hectare population is a good starting place for environments with moderate maize production potential (e.g. 2-3 tons/hectare). If you're producing 3-4+ tons/hectare, however, this population is probably too low. If you're producing closer to 1 ton/hectare, 45,000 plants/hectare is probably too high.

Moisture availability is by far the most important factor determining optimum maize plant density. In areas with plenty of rain and/or soils with high clay and/or organic matter content, which hold lots of moisture, optimum populations can reach 70-80,000 plants per hectare. In drought-prone areas,

on the other hand, optimum populations may be as low as 30,000 plants per hectare. In such environments, high maize populations quickly deplete soil moisture, causing stress during reproductive stages, and dramatically reducing yields.

Because one of the major effects of CA is to increase soil moisture-holding capacity (though increasing soil organic matter content and keeping soils covered), well-managed CA maize can often benefit from being planted at a higher plant population than conventional maize.

Other factors to consider in deciding maize populations include intercropping (if you are planting another crop together with your maize you may want to maintain somewhat lower populations), and the relative maturity of the maize variety (early-maturing maize should be planted at higher populations than later-maturing maize).

Cob size can, to some extent, help you know whether your maize spacing is near optimum. Very large maize cobs, or many plants with two cobs, are an indication that you could have achieved a higher yield by a higher seeding rate. A maize field planted at an optimum spacing typically has moderate-sized cobs. Keep in mind that the optimum plant population may vary from season to season (especially as rainfall varies), so plant spacing trials should be repeated for several years before making final recommendations.

Optimum maize spacing produces strong plants, without depleting soil moisture.

Maize Plant Spacing Recommendations

Country	Conditions	Between rows (cm)	Within rows (cm)	Plants per station	Plants per hectare
Ethiopia[1]	Early maturing varieties	75	25	1	53,000
	Full season varieties	75	30	1	44,444
Kenya[2]	High production areas	75	25	1	53,000
	Standard production areas	75	30	1	44,000
	Marginal production areas	90	30	1	37,000
Tanzania[3]	Early maturing varieties	75	40	2	66.666
	Full season varieties	75	60	2	44,444
Rwanda[4]		70	30	1	47,619
CIMMYT[5]	>1000 mm rainfall/season	75	25	1	53,300
(southern	600-1000 mm/season	75	30	1	44,444
Africa)	<600 mm rainfall/season	75	38	1	36,000

1. Debele., T. 1996. Determination of varietal combination and plant density for maize/haricot bean intercropping at Bako – western Ethiopia.
2. National Farmers Information Service: http://www.nafis.go.ke/agriculture/maize/establishment-of-maize/.
3. National Maize Research Programme recommendations as reported in Kaliba, et al. 1998. (CIMMYT)
4. Ministry of Agriculture and Animal Resources. 2009. Farmer's Diary.
5. Thierfelder, C. Personal Communication

Discussions From the Network

Waluza Munthali: SOLDEV works in the Nothern region and some parts of Central region of Malawi with CA farmers in "clusters" which are small manageable groups convenient for training, monitoring and evaluation. Maximum membership is 10. With clusters, participation becomes almost 100% since you are dealing with a small group of farmers...

Putso Nyathi: Do you have lead/contact farmers in these clusters?

Waluza Munthali: We have lead farmers in the second year onwards. this is the only time we can ensure that deserving farmers become lead farmers since they have been out standing for a year now

Florence Nduku: Utooni development organization (in Kenya) intends to use same approach with 10-15 farmers in a cluster around a lead farmer or TOT! This works well, happy to hear the practice in Malawi!

The CA Technical Officers manage a Facebook Discussion Group from which the above conversations were copied. If you'd like to join the discussion, sign up at www.facebook/CAinAfrica.

Partner Profile: Association des Eglises Baptistes au Rwanda (AEBR)

The AEBR was created in 1967, but now encompasses a 44,000 membership in 201 local churches. The AEBR Community Development Department manages 12 development projects throughout the country. Based on its accomplishments, AEBR received an international Award on Human rights and Justice offered by the Baptist World Alliance in Durban, July 2015.

AEBR has run food security projects in Kirehe District, an area frequently affected by drought, since 2008. The current project has targeted 1329 households, enhancing food security through training on Conservation Agriculture; providing quality vegetable, beans, banana and cassava seed; providing pigs and goats for household income and manure production; and formation of farmers' cooperatives to run income generating activities.

The CA package that is promoted to farmers includes:

- Zero or Minimum tillage of soil
- Mulching
- Compost making
- Crop rotation and spacing
- Agroforestry
- Green manure cover crops

Because of the dramatic reduction in labor demand, basin planting is catching on quickly in the area. Crop rotation and mulching are already practices which farmers have adopted widely due to government promotion. Another major success has been the introduction of cover crops, especially Velvet Bean (Mucuna) in banana plantations which are a major food and cash crop of the area.

Farmers clearly believe that these CA practices can bring changes in their livelihood. However there are more people to reach out to. AEBR hopes to expand and reach other communities as resources are available.

This Kirehe farmer's bananas will have moisture through the dry season thanks to his Mucuna mulch.

CATO Schedule: Neil Rowe Miller

16-19 February
Harare, Zimbabwe
CFGB CA Partner Annual Meeting

7-11 March
Makelle, Ethiopia
CA for Small Grains Workshop (various partners)

12-15 March
Burundi
Help Channel Burundi project inception meetings

4-8 April
Central Kenya
Soil Health Workshop

CATO Schedule: Putso Nyathi

16-19 February
Harare, Zimbabwe
CFGB CA Partner Annual Meeting

29 February – 4 March
Mohale's Hoek, Lesotho
Growing Nations Trust partner visit

14-18 March
Durban, South Africa
Seed of Hope partner visit

4-8 April
Central Kenya
Soil Health Workshop

10-15 April
Mozambique
Cover Crops follow-up with World Renew

25-29 April
Zambia
Chipembi Agriculture College Project Evaluation