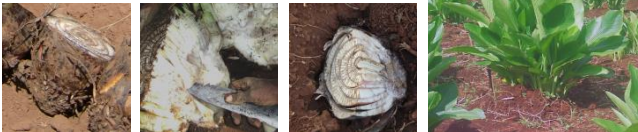


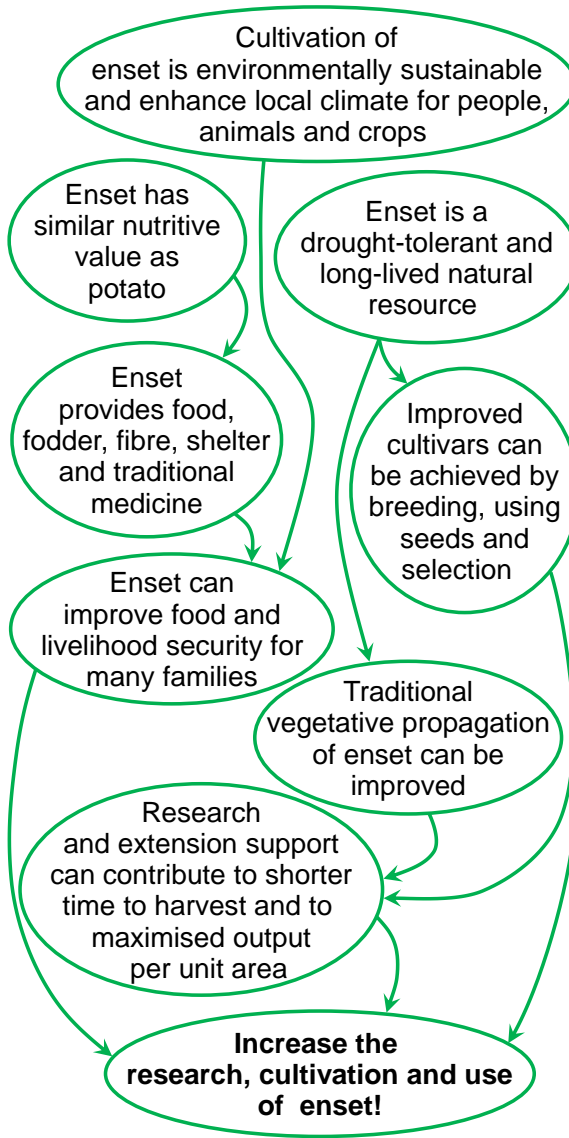
Planting:
 1) Dig up plant, cut off corm.
 2) Remove apical meristem (allows side shoots).
 3) Bury in soil, wait.



3669 saplings from 54 corms.
 Nine months after planting corms,
 six months after emergence.



Karlsson LM, Tamado T, Dalbato AL, Mikias Y (2013) Seeds of *E. ventricosum*. Seed Science and Technology 41:357–370.
 Karlsson LM, Tamado T, Dalbato AL, Mikias Y (2013) *E. ventricosum* seedlings. Journal of Plant Sciences 1:11–17.
 Karlsson LM, Dalbato AL, Tamado T, Mikias Y (2011) Sprouting and early growth of enset. Experimental Agriculture. x:x-x.



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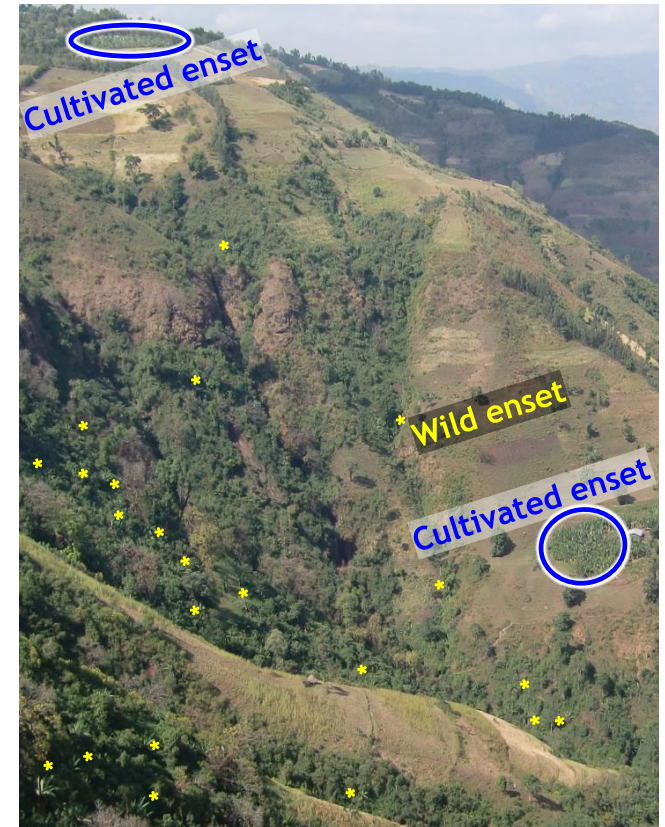
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Research summary:
 Seedling and sapling sprouting of
Ensete ventricosum
 a drought tolerant, multi-purpose
 crop from Ethiopia



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1. Saplings (sprouts from corms)

This is the proper and efficient production of enset

For thousands of years, farmers in Ethiopia have propagated enset vegetatively by taking a corm from a plant with desired characteristics and replanted it as shown in photo on back side. This is cloning; therefore the new plant will get the same characteristics as the previous. There are many landraces and different practices in use, and to give proper advice and stimulate enset cultivation requires documented knowledge about the effects.

1.1. METHODS We used six cultivars from Areka Research Centre and compared different corm treatments: keeping it entire or parting it in two or more pieces; in all cases also re-

moving the apical meristem; the growing point. We tested the effect of putting 50/50 dry cow manure and soil mix directly on the corm at burying, a method not used by farmers since it is believed to cause rotting. In addition, we investigated the effect of watering daily after planting corm; another method believed to cause it to rotten. Corms were buried in holes dug to 40 cm deep and 50 cm wide, bottom was refilled with 10 cm softened top soil and the corms were placed thereon. Planting was done in January, rain came mainly May to September; after sprouting, during growth.

1.2. RESULTS Sprouts emerged from 100 % of buried corms; no rotting occurred. The planting and fertilization method gave very large saplings (photo back side). The

number of saplings was strongly correlated to cultivar, but there were more saplings per corm the more the corm was split. Entire corm can better keep stored water and should be selected if prolonged drought is expected. Irrigation decreased time to emergence, gave more equal time to emergence and more uniform-sized sprouts.

1.3. CONCLUSIONS Corm propagation is efficient and reliable. Our findings and further research can improve the method. Sprouts from known cultivars, suitable for different purposes, can efficiently be produced and distributed to new areas and farmers being unfamiliar to enset cultivation, along with proper advice on propagation and production methods. Enset can be grown in much larger areas than today.

2. Seedlings (sprouts from seeds)

This is a way to develop improved cultivars of enset

Hundreds of enset landraces are used by farmers, and different landraces have different characteristics and are suitable for different purposes and preferences. Despite this, there is need for additional cultivars, with new or improved traits. A straight-forward way to achieve more genetic variation, making it possible to select desired qualities, is sexual reproduction through seeds. In cultivation, enset is usually not allowed to set seeds, because harvesting is done

at flowering (usually after 4-7 years of growth) for maximum yield, and little is known about enset seed germination and seedling development.

2.1. METHODS We collected seeds from wild and cultivated plants, and tested them for germination on moist sand and in combination with nutrients or chemical or physical treatments known to stimulate germination of some species with hard seed coats. Germinated seeds were planted in pots with field soil (Wolaita Sodo, Ethiopia) only or combined with dried cow dung or inorganic fertilizer. Ten seedlings were in addition planted in the field; method as for corms (above).

2.2. RESULTS Number of seeds per ripe enset plant was between 0 and 2000. On average, about 25 % of seeds germinated within 12 weeks when placed on moist sand; there was no positive effect of other seed treatments. Seedlings grew well in local soil and became significantly even larger when supplied with dried cow dung. The inorganic fertilizer was less suitable. The seedlings planted in the field grew fast and strongly, and within 24 months, four were flowering and were thus ready to harvest for food preparation.

2.3. CONCLUSIONS Seeds and seedlings can be used in research for selection of new cultivars. While germination results show limited success and it requires more research to achieve full germination, growing seedlings is unproblematic and can quickly give large plants. With the random recombination of the entire genome, which is the result of natural sexual reproduction with seeds, the number of combinations of genes, and thus expressed characteristics, is nearly endless.

Seedlings with desired traits should be documented, following established procedures for new cultivars, before being multiplied by cloning from corm (as above) and distributed.

While introducing enset to farmers being unused to the crop, or supplying farmers with enset to cultivate, seeds or seedlings must not be used. This is because plants from seeds have other characteristics than the parent plants, and plants in production should have known traits, suitable for the intended purpose. Well documented landraces and cultivars can efficiently be propagated vegetatively and distributed.

