

Working together to eliminate cyanide poisoning, konzo, tropical ataxic neuropathy (TAN) and  
neurolethyrism



# CCCDN News

**Cassava Cyanide Diseases & Neurolethyrism Network**

(ISSN 1838-8817 (Print): ISSN 1838-8825 (Online))

## Issue Number 37, June 2021

### CONTENTS

<b>EDITORIAL</b> .....	1
<b>ARTICLES</b> .....	2
<b>Grasspea production in Ethiopia</b> .....	2
<b>Outbreak of Konzo in Mulevala District, Zambezia Province, Mozambique</b> .....	4
<b>The current conflict in Tigray, Ethiopia is likely to lead to increased and excessive consumption of grasspea in areas where this crop is cultivated</b> 5	

### EDITORIAL

The Corona Virus disease (COVID 19) pandemic has changed our life globally and limited communication to some extent. Meanwhile a new grasspea website<sup>1</sup> and a grasspea twitter feed (76 followers)<sup>2</sup> have been created. These factors may have contributed to the lack of articles for the June issue until now. We apologise for the delay and encourage all readers to consider this newsletter as a multidisciplinary forum and archive for discussing topics related to cassava/konzo and grass pea/ neurolethyrism.

The late M Miles had the following suggestion, which we think also applies to Cassava. "To gain decision-makers' attention, it is useful to be able to prove that *Lathyrus* species have a long history within the country, showing some good features as well as bad. Still better, if one can show that indigenous knowledge and skills have historically been used to counter the problems of lathyrism, in appropriate, low-cost ways. An attractive solution may be one that can be explained comprehensibly to people without science degrees; and where the historical heritage is blended with technical innovation, giving not only 'invisible' benefits (i.e. rural people no longer being crippled, as they learn safer preparation of the least toxic varieties), but also positive gains (a readily available fodder crop, and a good famine safety-net when combined with feasible dietary supplements). Building the case requires well-founded knowledge from many sides"<sup>3</sup>

Researchers in areas heavily affected by Covid-19 are invited to report their local situation and its influence on food supply and daily diet. New readers are very welcome to introduce themselves and their work.

#### CCDNN Coordination:



Technologiepark 122 (AA Tower – 4th floor), B-9052  
Gent, Belgium

Dr. Delphin DIASOLUA NGUDI, Acting Coordinator  
Phone: +32 479 470 758  
Email: [ddiasolu@yahoo.com](mailto:ddiasolu@yahoo.com)  
or  
[delphin.diasoluangudi@ugent.be](mailto:delphin.diasoluangudi@ugent.be)

Howard Bradbury+ - Hon. Chairman and founder  
(1926-2016)

**Fernand Lambein+ - Hon. Coordinator (1938-2020)**

**Editorial Board:** Julie Cliff, Kuo Yu- Haey, Marc Heijde, Peter Nunn, Roslyn Gleadow, Dirk Enneking, J.P. Banea+(1954-2020), Arnaldo Cumbana, Ian Denton, D. Diasolua Ngudi,., N.L.V.Mlingi, Humberto Muquingue, Bala Nambisan, Dulce Nhassico, S.L.N. Rao, D. Tshala-Katumbay, Jan Elliott

#### Country Contacts:

**Cameroon:** E.E. Agbor;  
**D.R. Congo:** J. Nsimire Chabwine & Nicole Mashukano  
**Indonesia:** A. Hidayat;  
**Mozambique:** Anabela Zacarias;  
**Nigeria:** M.N. Adindu and P.N. Okafor  
**Website:** IPBO <http://ipbo.vib-ugent.be/projects/ccdn>  
ANU <https://tinyurl.com/5t3p7zd3>

In this issue, an outbreak of konzo is reported in Mozambique for the first time in 15 years. There have been sporadic new cases of konzo in the interval. Consumption of insufficiently processed bitter cassava was associated with the outbreak in a remote area, as found in other Sub-Saharan African countries.

There are also two very interesting reports about the recent situation regarding *Lathyrus sativus* (grass pea) in Ethiopia. This traditional pulse keeps being popular among farmers and has also been favoured by consumers in recent years. The possible reasons are discussed. The recent civil war in Tigray could have a great impact on the local food supply. Grass pea might become the only available staple. The same could be said for parts of Afghanistan where grasspea is cultivated. As famine, stress and monotonous diet are proposed as risk factors for *neurolethyrism*<sup>4</sup>, we hope local health workers and the Taliban will be aware of this!

For both diseases, konzo and *neurolethyrism*, one of the major concerns now is the Covid-19 Pandemic. Further studies are needed to confirm if food insecurity caused by Covid-19 has resulted in more cases of the diseases and the utility of the corresponding crops to prevent starvation.

**Reference**

- 1 <https://www.grasspea.net> ICARDA, The Crop Trust, The James Hutton Institute; financed by the Templeton foundation
- 2 @grasspeanet
3. Miles, M. Historical awareness of *neurolethyrism* and cassava toxicity.(2012) CCDN News bulletin Issue No. 20.
4. Lambein et al. Grass pea (*Lathyrus sativus* L.): orphan crop, nutraceutical or just plain food? (2018) *Planta* <https://doi.org/10.1007/s00425-018-03084-0>

*Editorial Board*

**ARTICLES**

**Grasspea production in Ethiopia**

The area of grasspea production in Ethiopia has almost doubled since 1994 (Figure 1) while production (Figure 2) and yield (Figure 3) has tripled in the last 25 years (1994 to 2019) according to the estimates of the Ethiopian Central Statistical Agency (CSA). This crop is obviously still being favoured for its resilience and versatile economic benefits by a large number of local farmers, despite the lack of research support it receives within Ethiopia.

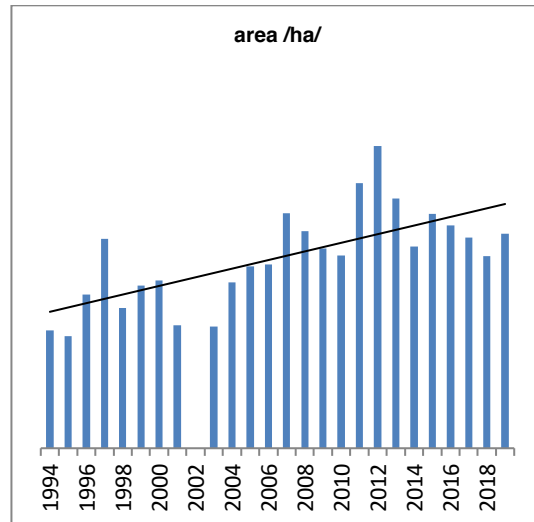


Figure 1: Area expansion of grasspea in Ethiopia

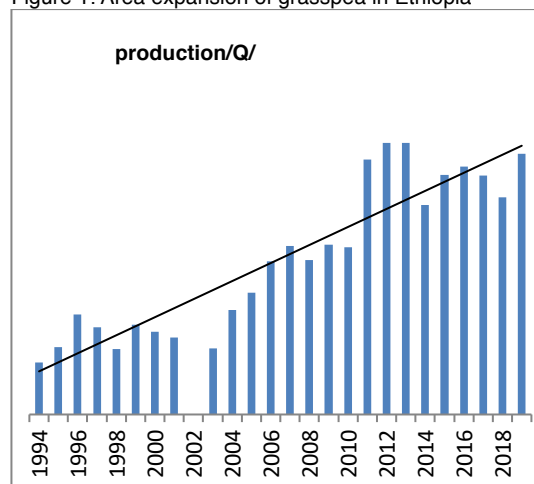


Figure 2: Production increase of grasspea in Ethiopia

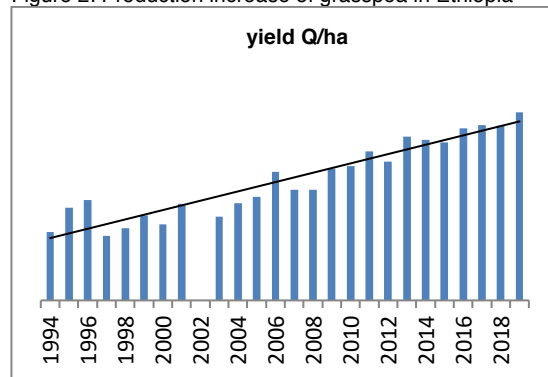


Figure 3: Yield improvement of grasspea in Ethiopia





Figure 4: Grasspea crops (green patches) late in the cropping season in Ethiopian central highlands (Photos taken by Asnake Fikre, Dec. 2020)

The crop is clearly identifiable standing up until late in the dry season (Figure 4) in the production system, where all other crops are already harvested.

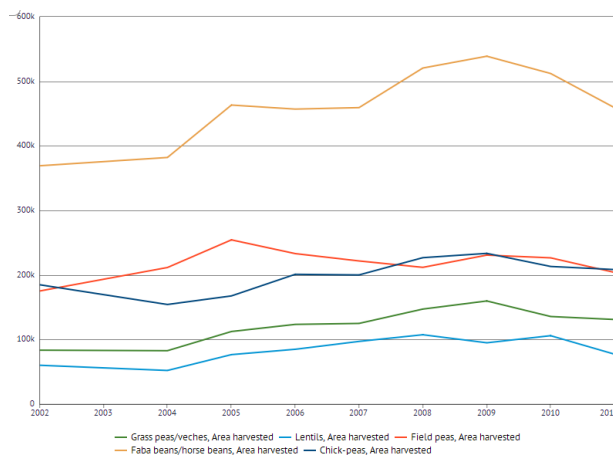


Figure 5 Area for Mediterranean pulses in Ethiopia 2002-2011

What would the expansion of grasspea, a non-strategic crop, imply for the legume sector? This would be a critical question that should be addressed by agriculturists and policy advisers of the government.

Grasspea is neither promoted nor prohibited in Ethiopia but it is simply ignored as a crop, while it serves a vital role in the food system for a significant part of the large Ethiopian population. Prohibition of grasspea in Asian countries could not be effective, as it is a crop suited to specific agroecological and socioeconomic niches for which few alternatives exist. The more than 300000 metric tons of pulses produced for this crop in Ethiopia, are estimated to be eaten by at least 50% of the Ethiopian human population. Shiro being a popular food in Ethiopia is prepared from grasspea as it provides a good taste to the curry, a widely used staple food. No one can ignore its importance, though in Ethiopia there are no policies supporting its breeding nor production. Addis

Ababa, capital of Ethiopia, with a human population of 5 million, ought to have most of the curry sourced from grasspea to substitute for field pea or other legumes. Farmers are attracted to the production of grasspea as it provides them with better financial returns and lower risks in terms of input costs.

The expansion in grasspea production and its consumption in the country (with small smuggling to neighboring countries exceptions) is likely to be due to the increase in the human population number with its lower price relative to other pulses attractive for consumers.

Getahun et al (2003) and Getahun (2004) found that the potential problem of neuropathy is essentially one of ignorance and that exclusive consumption should be avoided well in advance of dire circumstances [for details, the thesis abstract, cited below, is highly informative].

Therefore, there is a need to promote the safe utilization of grasspea along with good, socioeconomically sensitive, low input production practices. An appropriate investment opportunity beckons.

The challenges during the present COVID-19 pandemic are likely to lead to increased consumption of grasspea and predispose the least informed among the rural poor to the risk of neuropathy.

There are, new incidences already observed in some hotspot areas, signaling that neuropathy still remains a social health issue, with poor attention from the health system.

Why do farmers of today prefer grasspea to other legumes or cereals?

Though it is hard to suggest the exact reasoning, at least a few issues are drivers of this trend; the first could be the badly needed crop rotation to enhance and sustain production. This case is clearly evident in the Shoa-Gojam vertisol mega-plain where Tef dominates production and grasspea is a precursor crop to improve soil nitrogen levels and to provide disease breaks. The second possible reason is that still grasspea better adapts and withstands the rigors of diverse biotic and abiotic stresses while providing a reasonable harvest compared to any other legume alternatives. Grasspea has stress tolerance and high natural resilience. The third reason explained by the farming community is that its production cost is cheap, less physical input and labor demanding and its market price is increasingly attractive.

### Conclusion

Grasspea is a crop with inflating economic importance in Ethiopia. Solid investments are now

needed to optimize its socioeconomic and agroecological benefits. Lambein et al (2001), argued that grasspea, has saved many more millions of lives from starvation than it has posed health hazards. Grasspea, in Ethiopia, like elsewhere in the world, is currently expanding in the traditional food system, more steadily than ever before. It has promoted itself through withstanding the hazards of climatic challenges and pest invasion, as a persistently resilient crop emerging through natural selection. The nutritional limitations of the crop can basically be managed using appropriate safe consumption practices. It has nutritional value and antinutritional challenges like all other Mediterranean pulses. It is not exceptional among crops, as there are others with arguably more severe toxicologies e.g. cassava, lupine etc., but it can be effectively utilized through appropriate processing and as part of a mixed diet. Its main exception is the lack of funding it attracts.

### Reference

1. Fikre, A. 2019. Development of grasspea (*Lathyrus sativus* L) in Ethiopia. Issue Number 28, December 2016. CCDN
2. Lambein, F., Ngudi, D.D., and Kuo, Y.H. 2001. Vapniarca revisited: Lessons from an inhuman human experience. *Lathyrus Lathyrism Newsletter*. 2(1): 5-7.
3. Getahun, H., F. Lambein, M. Vanhoorne and P. Van der Stuyft (2003). "Food-aid cereals to reduce neurolathyrism related to grass-pea preparations during famine." *Lancet* **362** (9398): 1808-1810.
4. Getahun, H. (2004). Public health importance of neurolathyrism and epidemiological risk factors: evidence from Ethiopia. PhD thesis, Ghent University. <http://publication.eiar.gov.et:8080/xmlui/handle/123456789/1680> last accessed 5-8-2021
5. Fikre, A., Lambein, F. and Gheysen, G. 2006. A life saving food plant producing more neurotoxin under environmental stresses. *Communications in Agriculture and Applied Biological Sciences*. Ghent University, Belgium 71(1): 79-82.
6. Central Statistical Agency Agricultural Sample Survey 1994-2019 Reports on area and production of major crops in Ethiopia <https://www.statsethiopia.gov.et/our-survey-reports/>

**Asnake Fikre**

Ethiopian Institute of Agricultural Research

Addis Ababa, Ethiopia

### Outbreak of Konzo in Mulevala District, Zambezia Province, Mozambique

Bitter cassava is the staple food for many districts in Zambezia Province, and from 2000 till now, sporadic cases of konzo have been reported in some of these districts. In 2005, drought had resulted in a large epidemic in the central part of the province. A smaller

drought-related epidemic occurred in the same year in Nampula Province.

In October 2020, Mulevala District notified suspected cases of konzo and measles in Cohuia, Chiraco subdistrict, 39 km from the district capital. This district had not previously reported konzo cases. A team from the Physiotherapy and Surveillance Departments of the Provincial Directorate of Health went to investigate. They worked with community leaders, and patients and their families to carry out active case detection. They found 18 suspects of whom ten were cases of konzo. For the konzo cases, they recorded details on a standardized case investigation form.



Evaluating gait

The epidemic had begun in the middle of September and the ten cases of konzo were found up to the 17<sup>th</sup> October. The incidence rate was 1.25/1000 inhabitants.



Filling in the case investigation form

The age and sex distribution was: 0-4 years (2 female), 5-14 years (2 male, 3 female), 15 years and above (1 male, 2 female). Five cases were found in the same family - a mother, her three children and a niece. This age and sex distribution and multiple cases in the same family have been found previously for konzo. Three cases were mild (walked without support), two were moderate (needed support to walk) and five were severe (could not walk).

As in previous outbreaks, the timing coincided with the cassava harvest, when bitter cassava was the only staple available for consumption. More cases were expected, as the harvest had not yet finished.

### ***Conclusions and Recommendations***

This is the first konzo epidemic notified in Mozambique since 2005 and the first report of konzo from Mulevala District.

Unlike the 2005 epidemics, it was not associated with drought.

The concurrent measles epidemic added to the need to investigate the konzo epidemic. Konzo often goes unreported in the remote rural sites where it occurs.

No old cases of konzo were found, suggesting a recent deterioration in socio-economic circumstances, and increasing dependence on bitter cassava.

Recommendations were made for nutritional supplements, physical rehabilitation based in the community (CBR) and teaching of safer cassava processing.

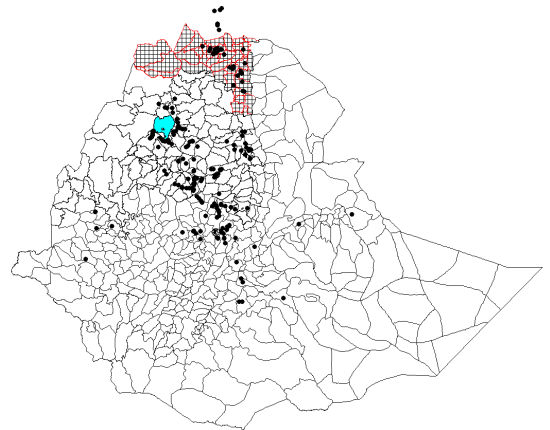
**Luís Nsele**

Provincial Directorate of Health, Zambezia Province

---

### **The current conflict in Tigray, Ethiopia is likely to lead to increased and excessive consumption of grasspea in areas where this crop is cultivated**

In order to assess where this may become a problem and to intervene, where this becomes possible, the following map may serve as a useful tool.



The distribution of grasspea (*Lathyrus sativus*) in Ethiopia

The Tigray region is marked with a square pattern. Individual administrative areas are outlined in red. Each dot is a location where *L. sativus* was collected by the Ethiopian Biodiversity Institute (data source, pers.comm.).

During 2003 Fernand Lambein and I visited Mekelle, Tigray and we noted:

“We interviewed a woman selling grasspea. She had 9 bags of grasspea, à 1 quintal (1 quintal = 100 kg) in store.

She sells ca 20 quintals of grasspea per week. Some wholesalers at the same market sell up to 40 quintals per week. There are 10 wholesalers at Mekelle market who sell grasspea. The whole seeded grasspea originated in Gonder. The price in Mekelle was quoted as 210-220 Birr/q and 2.5 Birr/kg. Fernand paid 3.5 Birr/kg.

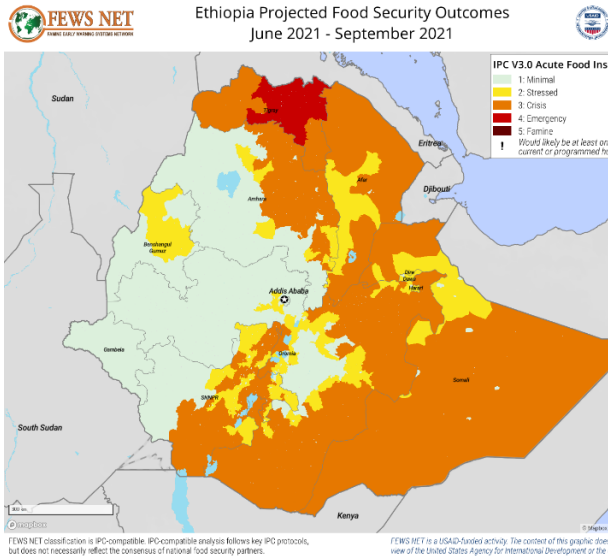
At Mekelle market there was also some locally produced grasspea for sale at a higher price. This could be purchased in processed and unprocessed form. Both types were the split, dehulled form. The processing involved boiling, dehulling, toasting and drying.”

Grasspea is usually only prepared to make shiro, a sauce or gravy eaten with kitta (unleavened bread) or injera (tef or cereal pancakes), however in the absence of cereals this must necessarily change.

A comparison of the above map with the current outlook for the food situation in parts of Tigray reveals

that the area marked for food emergency also has regions with high densities of grasspea collection sites.

Since it is well known that people rely on grasspea as a food of last resort, there is a high likelihood of excessive grasspea consumption for extended periods, unless aid is targeted to provide sulfur amino acid containing food or supplements.



<https://fews.net/east-africa/ethiopia>

**Dirk Enneking**

902 McFarlane Rd  
Greenpatch SA 5607  
South Australia

Let's make **Konzo** disappear

We know how to prevent konzo. You can help stop this crippling disease.

Find out more at [ql.anu.edu.au/konzo](http://ql.anu.edu.au/konzo)

CCDN News will consider for publication short articles and letters (1-3 pages A 4 double spaced) in English. Because CCDN News is a newsletter, full-size original papers or reviews cannot be considered for publication. Material published in CCDN News may be freely reproduced, but always indicate that it comes from CCDN News.

Please send all correspondence to the CCDNN acting Coordinator, Dr Delphin DIASOLUA NGUDI, Ghent University, Belgium: ([ddiasolu@yahoo.com](mailto:ddiasolu@yahoo.com) or [delphin.diasoluangudi@ugent.be](mailto:delphin.diasoluangudi@ugent.be)).



International Plant  
Biotechnology Outreach

