

Media coverage to promote sweetpotato silage production and utilization

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Abbreviations

CIP	International Potato Center
COVID-19	Coronavirus
KCCA	Kampala City Council Authority
Kg.	Kilogramme
ILRI	International Livestock Research Institute
NaCRRI	National Crops Resources Research Institute
NaLIRRI	National Livestock Resources Research Institute
SOPs	Standard Operating Procedures
SPVS	Sweetpotato vine silage
US \$	United States Dollar

Acknowledgements

I acknowledge financial and technical support from the International Potato Center (CIP). I thank Mr. Joshua Kato and Mr. Herbert Musoke of the Vision Group (New Vision and Bukedde papers, respectively) and Ms. Margaret Baruka of REST TV Uganda for offering to cover and disseminate sweetpotato production activities. Special thanks to the youth groups (MADCO Investment Limited; Bavubuka Tweekembe; Namulonge Sweetpotato Growers' and The Next Generation Agricultural Entrepreneurs) for promoting sweetpotato vines silage technology to end users.

Deliverable 2: Media coverage to promote sweetpotato silage production and utilization

2.1. New vision paper

On 19th August 2021, Mr. Joshua Kato, Editor, Harvest Money Magazine, New Vision paper, visited Mrs. Martha Matovu at her farm in Bombo to cover activities related to sweetpotato vine silage production as a business. Martha provides services to farmers who want to make sweetpotato silage. She also makes silage for sale. Mr. Kato informed me that during the 3 hours' interview with Martha, she received 10 telephone calls from farmers who wanted to book her services.

2.2. Bukedde paper

On 24th August 2021, Mr. Herbert Musoke of Bukedde paper (Vision group) covered activities being implemented by the Next Generation Agriculture Entrepreneurs Group, Bunnamwaya-Ngobe, Makindye sub-county, Wakiso district. The activities include:

- Feeding sweetpotato vines silage to pigs supplemented with green maize hydroponics fodder. The group does not make sweetpotato vine silage but buys it from farmers. Hydroponics green fodder production-- Hydroponic is a climate smart method of growing plants without soil. You use nutrient water at desired temperature and humidity. Through hydroponics it is easier and quick to produce nutritive green fodder for pigs, cattle, goats, rabbits and sheep.
- Making Compressed Complete Sweetpotato Vine Silage Feed Blocks.
- Small-scale pig production
- Small-scale local poultry production

The article was published in Bukedde Newspaper (Farming page) on 6th September 2021 (a copy is shown below).

2.3. Video coverage of sweetpotato silage production by REST TV Uganda Limited

On 8th September 2021, Ms. Margaret of REST TV Uganda Limited covered sweetpotato vine silage production at Kyakuwa Farm.



Media coverage by REST TV Uganda Limited

REST TV Uganda Limited is a private platform that provides information on farming to people of all generations. The documentary was done at Kyakuwa Farm, Seguku by members of Bavubuka Tweekembe Group (Yusufu Bazibumbira, Geoffrey Tumwebaze and Ibra Okiri). Seven women leaders from Makindye Municipal Council attended the training.

The video documentary was done free of charge. REST TV Uganda Limited paid for the materials that were used to demonstrate the sweetpotato silage technology. They also facilitated the youths who will make the silage. The Manager informed me that they have received requests from many farmers for a programme on sweetpotato vine silage making. A programme was aired on REST TV on Saturday, 11th 2021 from 11am to 12pm. The second part will be on air on and 18th September 2021.

2.4. Information materials produced

2.4.1. Newspaper articles

Two articles were published during the month of September 2021:

1. *'Sweetpotato silage good for livestock'* published on 3rd September 2021 (pages 26 to 27) in the Harvest Money Magazine of the New Vision paper (Annex 4).



2. An article on *"Students who make money during the lockdown"* through farming published in Bukedde newspaper 6th September 2021, pages 11 to 12).



2.4.2. Editing forage chopper manual

CIP purchased two forage choppers from Itungo Farms, Wakiso district. I was requested to edit the information in the manual to ensure safety of the machine (a copy of a manual is attached).

2 5: Disseminate information on sweetpotato vine silage technology using social media

I posted information on sweetpotato silage production and utilization on 15 WhatsApp farming groups.

1. Dairy Farmers Network (DAFAN);
2. Friends of Kampala City Council Authority (KCCA) Kyanja Agricultural Center;
3. Livestock Development Forum (LDF);
4. Go Farming Uganda;
5. Uganda National Farmers Federation (UNFF)
6. Association of Uganda Professional Women In Agriculture & Environment (AUPWAE)
7. Harvest Money Farmers;
8. Harvest expo trainers
9. Harvest money
10. Uganda Dairy Goat Farmers
11. Farm Smart;
12. Cattle farmers;
13. NECJOGH (Network of Climate Journalists of Greater Horn of Africa) MENTORING CENTRE
14. UG-AG-EXTENSION PLATFORM and;
15. Eastern and Southern African Dairy Association (ESADA)- Dairy Africa

Many farmers used WhatsApp group chats to ask questions on use of sweetpotato vine silage as a livestock feed and a source of income. There has been an increase in demand for silage from the recipients of the messages. In order to address the high demand for silage, we plan to increase production by involving more youth and women.

2 6: T-shirts and baby feeding bowls

Mr. Norman Kwikiriza, Monitoring and Evaluation Officer, CIP donated 30 T-shirts and 100 baby feeding bowls. These were distributed as follows:



Baby feeding bowls

NB: Copies of beneficiaries with their signatures are available.

List of beneficiaries of baby feeding bowls and T-shirts

Name of group	No. of baby feeding bowls	No. of T-shirts	Received and signed by
1. Bavubuka Tweekembe group	0	10	Mr. Vincent Lutwama; 0774550349
2. Mrs. Martha Matovu (MADCO Enterprises)	1	10	Mrs. Martha Matovu, 0774112810
3. The Next Generation Agriculture Entrepreneurs, Bunnamwaya-Ngobe	0	7	Mr. Derrick Kayondo, 0753183652
4. Yesu Akwagala Medical Centre, Wakiso District	17	0	Mr. Joshua Kisubika (Hospital Administrator-0701661777
5. Bunnamwaya-Ngobe Maternity Clinic	26	0	Mrs. Lwanyaga Lovincer (Midwife) 0754853886
6. Ramaa Leaders' Action Limited, Buziga, Makindye Sub-County	25	0	Hajati Nakabiri Shamin 0779434472
7. Mawanga Local Council 1, Makindye	25	0	Hajjati Nsubuga Zaituni 0772913699
8. Individual mothers from Seguku village	7	0	
9. Individual youths who help to make sweetpotato silage at Kyakuwa Farm	0	3	Yusufu Bazibumbila-0788681767 Brian 0704090036 Ibra Otit, 0751099933
Total	100	30	

Conclusion

The demand for sweetpotato vine silage as a livestock feed and a source of income for youth has increased tremendously due to the different methods we have used to disseminate the technology including posting information on WhatsApp farming groups. Many farmers have appreciated sweetpotato vine silage as the cheapest source of feed for pigs given the fluctuation in the cost of maize bran which many farmers depend on to feed their pigs. Currently, the cost of maize bran is Ushs 1,200 per kgm.

Recommendations

1. Develop/promote dual purpose sweetpotato varieties

One of the major challenges that might limit adoption of the technology is availability of sweetpotato vines throughout the year. Currently, there is a shortage of sweetpotato vines because farmers are starting to plant sweetpotatoes. This means that youth will not have a reliable source of vines during the next 3-4 months when farmers start harvesting the roots.

Livestock farmers have a challenge of getting sweetpotato vine silage. A farmer in Wakiso district informed me that he paid Ushs 750 per kg of sweetpotato vine silage. He said that he found it cheaper to buy sweetpotato vine silage at that price than buying poor quality maize bran (mixed with sawdust or sand) for his pigs. He said that he will need 3 kgs/pig/day of sweetpotato vine silage (Ushs 2,250) compared to 4 kgs/pig/day of maize bran (Ushs 4,800). He also said that his pigs grower faster when they are fed sweetpotato vine silage than when they are fed on maize bran and weeds. He supplements maize bran with weeds which he picks from neighbours' fields. He is able to sell castrated pigs within four months at an average weight of 50 kgs.

The National Crops Resources Research Institute, Namulonge has developed a number of sweetpotato varieties. According to Dr. Gorretti Nankiga, Head, Sweetpotato Programme, one of the dual purpose (food and fodder) sweetpotato variety that could be recommended to farmers producing silage is NASPOT 11. The variety produces high herbage biomass yield. This will ensure availability of silage throughout the year. Wagabolige is another variety that can be grown throughout the year.

1. Support more youth to adopt the technology

Many youth groups have requested for a simple leaflet describing sweetpotato silage production and utilization. There is therefore a need to translate a sweetpotato production brochure produced by CIP into at least three major local languages (Luganda, Runyakitara and Luo). There is also a need to support the youth to get loans to purchase forage choppers

2. Conduct on-farm trials to evaluate:

- Effects of ensiling sweetpotato vines with banana peels on nutritive value of silage and performance of pigs.
- Effects of ensiling sweetpotato vines with banana peels and maize stover on the nutritive quality of silage and performance of dairy cattle.
- Orange-fleshed sweetpotato (OFSP) is a special type of biofortified sweetpotato that contains high levels of beta-carotene. The variety has been adopted by a number of farmers (Source: NTV Seeds of Gold Programme, 25th September 2021, 6.30-6.50pm). There is a need to evaluate the quality of silage produced from this variety. Common clinical signs of vitamin A deficiency in pigs and livestock include reduced feed intake, reduced growth, night blindness, edema, diarrhoea, low conception rates, abortions, and stillborn or weak calves. Calves born to cows deficient in vitamin A may have trouble mounting a normal immune response.

Annex 1: CIP code of conduct for providers, consultants and other stakeholders

CIP is a project-based organization that carries out its agricultural research for development to achieve food security, well-being, and gender equity for poor people in root and tuber farming and food systems in the developing world, through research and innovation in science, technology, and capacity strengthening.

To achieve these institutional objectives, CIP must interact with providers, consultants, and other stakeholders.

CIP is committed to promote the highest standards of ethical conduct in all its activities and therefore has established this mandatory **Code of Conduct for Providers, Consultants and other Stakeholders**. CIP expects its providers, consultants and other stakeholders to follow these standards of conduct and professional integrity. Failure to comply with any part of this Code of Conduct will result in termination of business relationship with CIP.

APPLICATION/SCOPE

This Code of Conduct applies to all interactions between CIP, its providers, consultants, and other stakeholders.

CODE OF CONDUCT

1) Compliance with laws:

CIP's providers, consultants and other stakeholders must operate in full compliance with laws, rules, and regulations of the countries in which they carry out their activities, ensuring that working conditions are safe, workers are treated with respect and dignity and ensuring all research and operations processes are environmentally responsible.

2) Safeguarding of Children and Vulnerable Adults:

At CIP we have a duty of care towards protecting the well-being of children and vulnerable adults who are engaged and impacted by our research, programs, and activities. A child or vulnerable adult has the right to be protected from abuse during any CIP related program or activity. This includes protection from: exploitation, inhumane treatment, neglect, gender discrimination, religious/cast discrimination, physical abuse, sexual abuse, verbal abuse, emotional and psychological abuse, and corporal punishment.

CIP's Safeguarding of Children and Vulnerable Adults Policy specifies that all third parties, including implementing partners, vendors, consultants and contractors, shall adopt and implement similar policies and practices concerning the safeguarding of children and vulnerable adults, inclusive of adoption of codes of conduct, reporting obligations, training, communication, screening, and integrity due diligence.

It is the providers, consultants and other stakeholders' obligation to follow these practices and inform CIP immediately of any concern regarding Safeguarding of Children and Vulnerable Adults through the whistleblowing mechanism mentioned in clause 5 of this Code of Conduct.

3) Health and Safety:

CIP requires that its providers, consultants and other stakeholders' activities, consider a Health and Safety System focused on risk prevention to minimize the risks workers face when conducting their work. This includes having a good understanding and compliance of the Health and Safety regulations of the countries in which they develop their activities, a clear structure on authority and responsibilities for ensuring compliance, a structured approach towards health and safety matters and risk assessments, and the monitoring of health and safety issues with auditing of performance.

4) Prevention of fraud, bribery and corruption

CIP has zero-tolerance towards fraud, bribery and corruption. CIP's providers, consultants and other stakeholders may not offer, provide, or promise anything of value (including business courtesies) to any CIP staff or consultant to improperly obtain or retain business or to obtain an unfair commercial advantage. CIP's providers, consultants and other stakeholders must comply with all the applicable legislation on corruption, money laundering and financing of terrorism. Before entering into an agreement with CIP, and anytime during

the term of the business relationship or agreement, all providers, consultants or stakeholders must disclose any issues that may result in a conflict of interest or the appearance of a conflict of interest.

It is the providers, consultants and other stakeholders' obligation to inform CIP immediately regarding any possible concern on any matter contrary to the compliance of CIP's Code of Conduct, or breach of any law or regulation, through the whistleblowing mechanism mentioned in clause 5 of this Code of Conduct.

5) Whistleblower/complaint mechanism

CIP has a whistleblower policy that supports employees who communicate information about violations of laws, rules, regulations and policies within CIP, and also encourage them to report their concerns through the internal communication channels.

In the same line, CIP has established a whistleblower hotline link, <https://www.lighthouseservices.com/cipotato/> on its institutional webpage, <https://www.cipotato.org>, so that its providers, consultants and other stakeholders can file complaints or communicate any violation of laws, rules or regulations, when doing business with CIP. The hotline is administered by Lighthouse Services, Inc., an independent third-party provider and is designed to protect the reporter's confidentiality and anonymity, if requested.



Annex 2: Newspaper Article (published in New Vision paper)

Sweetpotato Vines Silage for Livestock Feeding and income Generation for Youth

Dr Kabirizi Jolly
(Livestock consultant/Farmer)

Introduction

Small-scale dairy cattle and pig production provide employment and regular income opportunities along the entire commodity value chain of production, processing and marketing. Women and the youth are the major contributors to and beneficiaries of small-scale dairy cattle and pig production systems, which, unfortunately, are gradually being devastated by climate change and extreme weather conditions. The major constraints affecting small-scale pig and dairy cattle production systems in Uganda are: inadequate (quality and quantity) feeds due to drought, floods, land shortage and inaccessibility by farmers to appropriate feed technologies. Feeding costs represent over 60 percent of the variable costs in smallholder livestock systems in Uganda. Poor feeding affects animal's growth rate, production, reproduction and health status of livestock.

Sweetpotato as a food and fodder crop

Sweetpotato is a staple food crop in Uganda that yields considerable residues in form of vines, peels and non-marketable roots. Sweetpotato vines have high palatability, protein content ranging between 18 to 30 percent depending on the variety and management) and digestibility. Sweetpotato residues can be fed to cattle, sheep, goats, pigs and rabbits. Sweet potato forage can be an emergency supply of cattle feed in times of feed scarcity.



Sweetpotato vines and roots

Use of the vines as a livestock feed is constrained by bulkiness, perishability and a lack of wide application of conservation technologies that would extend the useful life of the material.

In the rainy season, the vines are available in plenty from peri-urban and urban food markets. However, due to their high moisture content and bulkiness, a lot of the sweetpotato vines cannot be kept for long because they rot and deteriorate in feeding value. Research supported by the International Potato Center (CIP) in Kamuli district showed that farmers waste up to about 599 kg/acre of vines and non-marketable roots.

Sweetpotato vines silage technology

To facilitate the use of sweetpotato vines beyond the rainy season and to bridge the feed gap in the dry season, a team of research scientists from the International Potato Center (CIP), International Livestock Research Institute (ILRI) and Makerere University developed a “**Sweetpotato vines silage technology**”. **Silage** is a simple

feed preservation technology that enables fresh fodder to be stored under airtight condition for more than one year

Polythene tube sweetpotato vines silage making technology for small-scale farmers

With a constant supply of sweetpotato vines silage, small-scale livestock farmers can triple their income for the same period through milk and meat sales. This can be made possible by the use of **polythene tube silage making technology**. Materials required to make sweetpotato vine silage using polythene tube silage technology:-

- Chopped sweetpotato vines and non-marketable roots
- Maize bran or molasses mixed with water (ratio: 1 molasses to 2 water)
- Black polythene tubes, 600-800 micron gauge. A 1.5-metre polythene tube can hold 50 to 70 kg of silage.
- Forage chopper or a machete
- Tarpaulin/canvas
- 100 kg- synthetic sac
- Watering can
- Water
- Sisal twine
- Labour to make silage

Major steps in sweetpotato vine silage making process

Step 1: You can use sweetpotato residues (non-marketable sweetpotato roots and vines) from a food market such as Owino or harvested from your garden or neighbours. Mix chopped non-marketable sweetpotato roots with vines in a ratio of 3:1. Chop the residues using a motorized forage chopper or a panga to about 2.5 cm length. Chopping facilitates compaction; it releases plant juices, stimulating the growth of lactic acid bacteria and; it increases silage intake by the animal.



Chopping sweet potato vines

Wilt chopped residues for 1-3 hours under the sun to reduce moisture. Add salt (0.5%) to improve the taste. Weigh the chopped residues (vines and roots) and spread it on a tarpaulin.

Step 2: Uniformly sprinkle 10 kgs of maize bran (ferment starter) for every 100 kgs of chopped residues **OR** dilute molasses solution at a ratio of 1 part molasses with 3 parts water. Spread maize bran or diluted molasses over the chopped residues and mix thoroughly. Molasses provides sugar (energy) to animals, improves palatability of feed rations and aids fermentation during silage making. Molasses or maize bran increase the production of lactic acid which serves as a preservative.



Mixing chopped vines with maize bran

Step 3: Making plastic tube silo: Open up a polythene tubing (gauge 600-800 microns thick) and cut a piece of 1.5 meters long for every 50-70 kg of chopped material. Pleat the black polythene tube lengthwise. Tie firmly with a sisal twine at 30cm distance from the cut edge. Fold back the edge and tie once again to exclude the air. The container in which silage is kept is called a “silo”.



Tie one end of a tube



Turn the tube inside out

Step 4: Place a plastic tube into another 100 kg synthetic sac (used for packing sugar, salt, rice and maize flour). The synthetic sac protects the polythene tube from being damaged by rodents and hot weather.



Place the polythene tube silo into a- 100 kg synthetic sac

You can use plastic drums or reusable plastic silo bags.



Plastic drums



Reusable plastic tube silos



For reusable plastic silo bags contact Itungo Farms (0786430790) or Mr. Yiga (0784268061), Container Village.

Step 5: Fold the top half of the tubing over the sides of the lower part. Fill the tubing a little at a time with chopped mixed material. Every after adding about 25 kgs step over the material to compact before adding more. Take care not to tear the polythene tube. Fill until about one quarter of a meter is left.



Compact the material in the bag to remove air



Tie the bag firmly

Use a sisal twine to tie off the top firmly excluding the air in order to encourage the growth of fermentation bacteria

Step 6: Store sweetpotato silage bags silos under a shade. Concrete or a wooden floor provides excellent surface for silage bags, easy removal of feed with little or no damage, can achieve exceptional drainage of water away from bags, discourages pests and makes inspection for damaged bags very easy. Rodents like rats that could tear the tube need to be controlled. Under anaerobic conditions, silage can be stored for up to 3 years.





Silage drums and bags

Maintenance of sweetpotato silage bags

- Number and date each bag for easy identification and recall of materials bagged.
- Do not allow dogs, cats, children and other animals to climb the bags.
- Inspect the silage bags on a regular basis and if possible and seal holes at once. If damage is extensive, the silage needs to be re-bagged as soon as possible.
- Do not leave the silage bags opened overnight.
- If maintenance is appropriate after 21-30 days, excellent lactic acid fermentation will result and bags kept well for six months, with no or little fungal spoilage.
- After emptying, the bags must be carefully washed, dried and stored in a safe place for use the following year.

Characteristics of good quality silage

- Well-preserved silage is green, yellow, or pale brown. Dark brown silage is poorly preserved.
- Well preserved silage has a sweet, tobacco smell. Foul, rancid smells indicates poor preservation.
- The silage is liked by animals because of good taste and pleasant aroma.
- No mould growth.
- Good silage is free flowing and non-sticky texture.
- Good silage has a protein content of about 18 percent.

Recommendations on feeding sweetpotato vines silage to pigs: Key messages

- Farmers rearing pigs can reduce the cost of production by over 50% through adopting sweetpotato vine silage technology.
- A pig consumes 3-6 percent of its body weight per day.
- Remove enough silage to feed your pigs for the whole day and tie the silage bag again to ensure air or water does not get in.
- Weigh the pig on weekly basis to know how much feed to provide.
- Sweetpotato silage is best fed to pigs which are over 3 months and weigh more than 25 kgs.
- Sweetpotato silage (main feed) should be supplemented with an **ideal feed (supplement)**. The silage should comprise of 60% and the supplement 40%.

Composition of pig feed supplement

Ingredient (kgs)	Quantity (kgs)
Maize bran	76
Soya bean cake	20.5
Shells	2
Lycine	0.5
Vitamin mineral premix	0.5
Salt	0.5

- Farmers can record an increase of over 400grams/day body weight.

- Farmers should note that this does not completely replace commercial feeds, it only enhances the pigs' growth rate hence one sells his pigs faster as it is taken to be a snack.
- Water should always be available for the animals otherwise they will not be able to feed properly hence growth rate will be affected.
- Control diseases and pests.

Recommendations on feeding sweetpotato vines silage to lactating dairy cows: Key messages

- Sweetpotato vine silage has a protein content of about 18 percent which is higher than common Napier grass varieties (about 12 percent protein).
- Sweetpotato vines silage supplementation improves dry matter intake but supplementing beyond 100 gm/kg (or 10%) of the daily feed intake is not cost-effective.
- Milk yield increases by about 1.5 litres per cow per day with sweetpotato vines silage supplementation.
- To prevent tainting the milk (off-flavour), do not feed sweetpotato vines silage to lactating dairy cows within 30 minutes of milking.
- Provide adequate basal feed e.g. grass hay, fresh grass, maize stover haylage etc.
- Provide clean water and mineral licks throughout the day and night
- Supplement the cows with a source of energy such as dairy meal.
- Carry out tick control and other animal health routine management practices (vaccinations, deworming, and disease control).
- Maintain a clean environment for the animals.

Sweetpotato vines silage as a source of income and a service delivery for the youth

Youth unemployment in Uganda stands at about 70%. Experiences of unemployed young people include lowering of self-esteem, a feeling of uselessness and a sense that life may be meaningless. Youth unemployment has a negative effect on the individual and the family, but also on the broader community in the form of serious economic and social consequences.

A number of youth groups in Uganda such as: Bavubuka Twekembe (Wakiso and Luwero districts); The Next Generation Agriculture Entrepreneurs (Makindye Municipal Council); Bujuuko Youth Alive (Mpigi district); Namulonge-Kasambya Sweetpotato Growers Group (Wakiso district) and MDCO Investments Ltd (Wakiso district) are innovative youth-led business models in which young men and women offer commercial sweetpotato silage production support services to farmers. The groups were trained on sweetpotato vine silage production, utilization and marketing through support from the International Potato Center. Members of youth groups have trained fellow youth, men and women in different districts of Uganda and in Kwembe, Dar es Salaam, Tanzania. The members have also participated in many agricultural shows such as Harvest Money Expo, World Food Day and Jinja Agricultural Show to demonstrate the sweetpotato vines silage technology to stakeholders.



Youth groups demonstrating sweetpotato vine silage technology during an agricultural show

Mrs. Martha Matovu, (0774112810), a qualified agricultural engineer and a Director of MADCO Investment Ltd is one of the many youth groups? offering sweetpotato silage production services to farmers. Martha got a loan and purchased six motorized forage choppers to make sweetpotato silage for farmers as a business. She has trained over 30 youths who assist her to make silage for farmers. She also makes silage for sale to farmers.



Martha making sweet potato silage

Sweetpotato silage marketing hubs

The International Potato Center has facilitated two youth groups (Bavubuka Tweekembe in Luwero district and Namulonge-Kasambya Sweetpotato Growers Group in Wakiso district) with motorized forage choppers to chop sweetpotato residues. The Center will also provide a chopper to the Next Generation Agriculture Entrepreneurs in Makindye Municipal Council.

The Center also supported the same youth groups to establish sweetpotato vine silage marketing hubs. The groups produced and sold over 200 tons of sweetpotato vine silage during the period of 2019 to 2021. The main customers are urban and peri-urban pig and dairy cattle farmers.