



Report on mung bean field activities – Oct 17-Nov. 2, 2019
Mung bean (*Vigna radiata* L.): Protein-rich legume for diet diversification and malnutrition reduction in Senegal

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Celebrating the production, harvest and consumption of mung bean in the St. Louis Region of Senegal (Field-to-Fork)

Part I. Overall objective: Strengthen Farmer Groups' ability to provide high quality, nutritious commodities and connect them to school feeding programs

Specific objective: To Evaluate mung bean production and nutrition- (cooking demonstration)

Table 1. Summary of comments shared from several farmers/individuals across the St. Louis Region of Senegal (**Fa Nder, Dagana**)

<p>Question: What was your first-year experience growing, harvesting and consuming mung bean?</p> <p>Attendance: 8 F, 9 M and 15 children</p> <ul style="list-style-type: none">• Fast growing plant (short cycle from planting to harvest) – 66 days. Faster than any other crops currently grown in the region said the community leader in Fa Nder. <p><i>Significance: A short life cycle crop that can germinate, grow, and produce during a very short period of available moisture is extremely important in arid climates.</i></p> <ul style="list-style-type: none">• Grows well with no added fertilizer (can benefit from fertilizer applied for previous crop). In this case, mung bean followed onion thus benefited from the residual nitrogen, phosphorus and potassium applied to the onion.• 100% germination rate (all seeds planted germinated) within 3 days after planting.• Yield from first harvest: 5.5 kilos (the size of the area not available) on demonstration plots.• Love the taste of mung bean.• Women prepared 2-3 different mung bean dishes – and presented to 3 judges.• The community including children enjoyed eating mung bean prepared by several women in the community <p><u>Problem encountered</u></p> <ul style="list-style-type: none">• Some problem with insects and disease – mainly due to the wet and warm climate. The community believes that the insect and disease problems can be solved by planting mung bean during the dry season under irrigation. That is to plant mung bean between November-March.• Too much rain this year – caused the mung bean plant to stand in the water for extended time – which mung bean cannot tolerate. As an alternative, mung bean can be grown on sandier soils.
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Improving livelihoods of smallholder farmers

Table 2. Summary of comments shared from several farmers/individuals across the St. Louis Region of Senegal (**Kassack Nord, Dagana**)

Question: What was your first-year experience growing, harvesting and consuming mung bean?

Attendance: 5 F and 5 M

- Fast growing plant (short cycle from planting to harvest). Planted July 30th, 2019
- 1st harvest – 9/20 (52 days from planting to harvest – one of the shortest cycles recorded in Senegal)
- 2nd harvest – 9/25 (57 days from planting to harvest)
- 3rd harvest – 10/3 (65 days from planting to harvest)
- Yield from 1st, 2nd and 3rd harvests, 4.2 kilos/3000 m² area. They did not plant all the 6 kilos they received from CPI.

Significance: A short life cycle crop that can germinate, grow, and produce during a very short period of available moisture is extremely important in arid climates. Plus, the short-cycled crop can reduce the hunger period (the period between planting and harvest).

- Irrigated 2X before the rain and the rest of the time – crop was rain-fed
- No added fertilizer which could help in saving inputs for cash crops.
- 100% germination rate (all seeds planted germinated) within 3 days after planting.
- Love the taste of mung bean
- Women prepared 2-3 different mung bean dishes – and presented to 3 judges.
- The community enjoyed eating mung bean prepared by several women in the community.

To the question – would mung bean replace any crop you are currently growing?

The answer: May replace some of the horticultural crops (vegetables) mainly due to its short cycle thus the potential to grow and harvest 2-3 times/year.

Problem encountered

- Some problem with insects mainly due to the wet and warm climate. The community believes that the insect and disease problem can be solved by planting mung bean during the dry season under irrigation. That is to plant mung bean between November-March.
- Too much rain this year – caused the mung bean plant to stand in the water for extended time – which mung bean cannot tolerate.

Impactful statements from Mr. Omar Sow (aka Mr. Mongo bean). Mr. Sow is in charge of the day-to-day operation and management of the community garden. According to Mr. Sow, mung bean is the future of Senegal “the next cowpea for Senegal”. He said he can eat mung bean for breakfast, lunch and dinner. In fact, he brings well-prepared mung bean snack with him to the field for lunch. His wife said “that is all he wants to do – plant-cultivate-harvest and eat mung bean”.



Mung bean – “the next cowpea for Senegal” (Mr. Omar Sow)

Table 3. Summary of comments shared from several farmers/individuals across the St. Louis Region of Senegal (**Temeye Thiago, Dagana**)

<p>Question: What was your first-year experience growing, harvesting and consuming mung bean?</p> <p>27 F (no men attended the meeting). The men thought the meeting was only for the women 17 women were involved in the cooking demonstration</p> <ul style="list-style-type: none"> • Fast growing (short cycle from planting to harvest) – 53 days. Faster than any other crops currently grown in the region. <p><i>Significance: A short life cycle crops that can germinate, grow, and produce during a very short period of available moisture is extremely important in arid climates.</i></p> <ul style="list-style-type: none"> • Grows well with no added fertilizer (can benefit from fertilizer applied for previous crop). In this case, mung beans followed green peppers which was heavily fertilized with NPK. The mung bean benefited from the residual nitrogen, phosphorus and potassium applied to the green pepper. • 100% germination rate (all seeds planted germinated) within 3 days after planting. • Mung bean grown under irrigation (4X) and rain-fed conditions. • No major problem with the rain (no standing water in the field). Unlike other communities, the Temeye Thiago community like to grow mung bean during the rainy season. In Kassak Nord and Fa Nder, the soils are susceptible to waterlogging (standing water in the field) when the amount of rainfall exceeds the ability of the soil to drain away the excessive water. Where soils are sandier in Temeye Thiago, infiltration is much higher through the soil profile thus limiting the amount of water standing in the field. • Harvested 3X (no data on yields). • The manager of the community garden said he loves mung beans and he can eat mung beans every day. His favorite snack is mung bean (boiled mung bean + salt). • We asked if growing mung bean interfered with their normal cropping systems – the answer was no – that is because mung bean does not require additional input (requires relatively less water and fertilizer to grow). The community garden partner said “not much investment to grow mung bean”. • Several women prepared 3 different mung bean dishes – and presented to 3 judges. They said that mung bean cooks very quickly which could help in wood energy conservation efforts. • Everyone enjoyed eating the mung bean prepared by the women in the community. <p><u>Problem encountered</u></p> <ul style="list-style-type: none"> • Herbicide in irrigation water injured the mung bean plants. The sugarcane company at RT is the source of the irrigation water. Due to the considerable interest in mung bean, the manager said he replanted mung bean to replace those damaged. • Some problem with insects. We (CPI/VT) suggested that they weed mung bean plots at least once before flowering.



The village where the best mung bean dishes were prepared – “mung bean is good food”

Table 4. Summary of comments shared from several farmers/individuals across the St. Louis Region of Senegal (**Thiewle, Podor**)

<p>Question: What was your first-year experience growing, harvesting and consuming mung bean?</p> <p>Attendance: 15 F and 10 M</p> <ul style="list-style-type: none"> • Fast growing plant (short cycle from planting to harvest) – 52 days (planted August 14 and 1st harvest October 6). Faster than any other crops currently grown in the region. The most impressive mung bean field in the region. <p><i>Significance:</i> <i>A short life cycle crop that can germinate, grow, and produce during a very short period of available moisture is extremely important in arid climates. Podor is characterized as having acute food insecurity and residents have been regular recipients of food aid. Therefore, the introduction of mung bean, a short cycle crop to the region offers a new opportunity to reduce dependence on food aid and mitigate hunger and malnutrition in this area.</i></p> <ul style="list-style-type: none"> • Good yield (1st harvest 35 kilos/2500 m² area). Expected to harvest at least 3 times more. We (CPI/VT) gave them 6 kilos of mung bean • Much higher yielding than the commonly grown cowpea (mostly due to a higher number of seeds per pods and multiple harvest from the same plant). • Grows well with no added fertilizer (can benefit from fertilizer applied for previous crop). • 100% germination rate (all seeds planted germinated) within 3 days after planting • Mung bean was grown under irrigation. • Love the taste and texture of mung bean. Initially, the women said they were concerned that children may not like mung bean but the children loved mung bean. <p>The women said they see many benefits from growing/preparing/consuming mung bean:</p> <ul style="list-style-type: none"> • Mung bean is easy to cook (faster cooking time compared with cowpea) • Easy to shell (seedpods turn dark, and as they ripen, the seedpods crack open revealing the dark green seeds) • Easy to prepare (use and benefits are versatile). • Can use it in various recipes. • Can just boil it add salt and eat it for snack. • Several women prepared 4 different mung bean dishes – and presented to 3 judges. • The judges and the community enjoyed eating the mung bean prepared by the women. <p>Thiewle's the recipe of success:</p> <ul style="list-style-type: none"> • Excellent information flow between community leaders, community/school partners, the community in general and CPI/VT program leaders • The community in general immediately understood the potential market value of mung bean • No uncertainty about how to manage/handle the new unfamiliar crop (mung bean). <p><u>Problem encountered</u></p> <ul style="list-style-type: none"> • None



Thiewle – Pioneering mung bean farming in Senegal

Note: The women from the 4 villages (Fa Ndar, Kassack Nord, Temeye Thiago and Thiewle) above made several mung bean dishes (their own recipes) using local ingredients. Some prepared the mung bean with spicy red sauce, mung bean with white sauce, and mung bean salad, mung bean snack, mung bean, mung bean beignets with red sauce etc. Each woman provided a list of ingredients in each dish and the cooking time: in the red sauce was tomatoes, onion, fresh pepper, carrot, black pepper, oil, salt, and onion; the white sauce included everything used in the red sauce minus the tomatoes. The salad had fresh pepper, tomatoes and onion. The salad dressing was made with oil, fresh squeezed lime, black paper and salt. The snack was simply boiled mung bean plus salt! All delicious! After the cooking contests, we (CPI-VT) gave them additional whole and split mung bean recipes.

Part II. Introduction of mung bean: School and Community gardens

Table 5. The introduction of mung bean to several villages within the departments of Podor and Dagana (**Thiagar, Dagana**), St. Louis Region of Senegal

Introduction of mung bean for food and feed
<p>Attendance :7 F, 11 M (4 more men came to the field)</p> <ul style="list-style-type: none">• Second visit of the village. In July/August, the community decided to plant mung bean during the dry season (October).• We shared information about general agronomic practices associated with growing new crop (adaptation, management (crop production and protection), marketing, utilization, nutrition, and feed values and other relevant topics.• Following the information exchange between the community leaders, teachers, head master, villagers and CPI and VT representatives, we went to the community garden (newly acquired land) to start planning (demonstrate planting – row-spacing, plant density, planting depth etc.). The community was highly engaged and excited to start growing mung bean.



Table 6. The introduction of mung bean to several villages within the departments of Podor and Dagana (**Thiago, Dagana**), St. Louis Region of Senegal

Introduction of mung bean for food, and feed – School Garden

Attendance: **5 F and 11 M**

- In July, 2019, we presented mung bean-centered student curricula in the villages of **Thiago, Temeye Thiago, and Keur Mbaye Peul**.
- We were thus able to create an innovative pipeline approach to community-based learning from birth to adulthood, which increases the region’s ability to prepare the next generation workforce, as well as develop community buy-in through integrating needs and learning from an early age.
- The teachers and school principal told us that they are very interested in having experiential learning tools. One teacher said that students were taught about seed germination but never experienced it before. Thus, having mung bean in the garden represents a unique opportunity not only to learn about life cycle of plants but also be able to consume what the students are growing.
- Established school garden (Oct. 24).
- **Mr. Mohomodou Niang (the school principal) has been sending updates via e-mail.**
- **Mr. Niang said “students must be involved in the entire value chain of mung bean”. He advocated school garden as educational tool.**
- **The director and the teachers mentioned issues in acquiring water for the garden.**
- We discussed the introduction, adaptation, and management of mug bean including agronomic practices (planting, row-spacing, cultivation, plant characteristics etc.).
- Previously, we were told that there is no community garden at this village. However, this time, a group of men and women from the community want to have a community garden due to the agronomic and health benefits of mung bean (very heated discussion – “WE WANT TO GROW MUNG BEAN” one of the community leaders shouted!). Following the meeting we went to see the site/land for the community garden and decided to give them community 6 kilos of mung bean to plant 0.25 ha.

Pictures : Courtoisie of Monsieur Mamoune Niang

With message: “J espère que vous allez bien et à l’université ?Le jardin se porte bien et se développe petit à petit. Vous avez le bonjour des enseignants et des élèves”.



Table 7. The introduction of mung bean to several villages within the departments of Podor and Dagana (**Keur Mbaye**), St. Louis Region of Senegal

Introduction of mung bean for food, and feed – School Garden

Keur Mbaye (Dagana)

Attendance: 4 F and 11 M

- In July, 2019, we presented mung bean centered-student curricula in the villages of Thiago, Temeye Thiago, and **Keur Mbaye Peul**.
- Unfortunately, this particular community did not make any progress towards securing garden space or water for mung bean.
- However, we had a long and productive discussion with the community about mung bean and the community decided to plant mung bean the first week of November. We gave the community 5-6 kilos of mung bean.
- A group of women from the community want to have their own garden and requested for mung bean seeds and we gave them 1 kilo of mung bean.



Table 8. The introduction of mung bean to several villages within the departments of Podor and Dagana (**Fanaye Wal**), St. Louis Region of Senegal

Introduction of mung bean for food, and feed – School Garden
<p style="text-align: center;">Fanaye Wal (Podor)</p> <p>Attendance: 37 F and 18 M</p> <ul style="list-style-type: none">• A large number of women and men attended the meeting!• Unfortunately, livestock got into the garden and grazed down the mung bean crop not once but twice. The community explained how and why the animals got into the garden:<ul style="list-style-type: none">○ “Mung bean was the only green plant in the community in August thus attracted so many livestock starving for feed”.○ The fence was not good enough to exclude livestock from entering the garden.○ The area surrounding the garden was flooded so animals took shelter in the garden.• The women were very interested and excited to start their own mung bean garden. So, we gave each woman 20-25 grams of mung bean.• The community planned to grow mung bean on 0.25 ha garden space and we gave them 6 kilos of mung bean. They said “this time we will protect the garden from livestock”.• Encouraging turn of events – the school has a garden – growing mung bean- the students were watering the garden while we were there. The head master said they are using the school garden as a pedagogical tool to teach the students “how to grow crops and eat it too”



Lessons learned from the first round of mung bean cultivation from “Why mung bean for Senegal”.

- Mung bean’s appealing quality for Senegal includes its quick and aggressive start, short season or early maturing (50-65 days from planting to harvest), its dual use for food and livestock feed, and high market value.
- Mung bean is well adapted to Senegal’s climate and growing conditions include drought tolerance, and adaptation to marginal soils, relatively low nutrient requirements, and low management requirements.
- Mung bean can be used as a food, livestock feed, or cover crop. As a food, dried beans (whole or split) may be consumed with staple crops such as rice or millet. Mung bean, thus, represents a major addition to the limited legume crops and supplement to cereal-based diets in Senegal.
- Mung bean producers from Senegal’s river valley (floodplain recession), may have competitive advantage compared to those growing mung bean under rain-fed and/or irrigation regimes. This is due to the high water-holding capacity of the heavy clay soil.
- Positive feedback on new/alternative crop (mung bean) as a means to diversify the cropping systems, add potential income to the household and contribute to dietary diversification of the community.
- Positive feedback from women included the ease and desirability of mung bean harvest, food preparation, and utilization (taste good).
- The meetings and field visits provided opportunity for the farmers to interact with each other, school officials, regional and local facilitators and VT/CPI project leaders. Mung bean also provided a platform for all the stakeholders involved to discuss diet diversification and malnutrition reduction at the community level.
- Overall, the excitement surrounding the introduction, production and consumption of mung bean in the St. Louis region of Senegal has been incredibly exciting and encouraging.
- We observed no reservation or uncertainty on how to handle/manage a new and unfamiliar crop like mung bean.