



3rd mission report

Regenerative Agriculture in Belize
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Context and objectives of the mission

This assignment is undertaken by the [NGO Nitidæ](#) with the support of 2 external consultants, Esteban Pereira from the Costa Rican consulting company [Sembrando Flores](#), and Loren Luyendyk from the USA consulting company [Santa Barbara Organics](#).

This document is a concrete action plan, based on the previous reports and recommendations, to start an intensive implementation of the Conversion Plan (CP).

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1. Mission's details and agenda

The mission 3 of the contract was developed to support the direct implementation of the conversion plan, with special attention on the process of composting, producing liquid fertilizers and establishing a coherent model to apply this on the large scale of the farm.

The initial days of this mission, a message was received from the Corporate Management of TexBel Farms, indicating an urgent need to start the certification process. This changed the mission agenda, accelerating the conversion plan implementation, with the intention to achieve an organic certification in a shorter time than planned.

Tableau 1: Agenda of the mission

Day	Date	Activities
Sunday	20 Feb	Trip to Belize, arrival to Hopkins.
Monday	21 Feb	Visit to Camalote farm, evaluation of practices, check of ware house.
Tuesday	22 Feb	Evaluation of compost and liquid fertilizer management.
Wednesday	23 Feb	Meeting on Organic Certification.
Thursday	24 Feb	Making of BioI (organic fertilizer from biogas unit). Meeting with all workers. Meeting with a possible outgrower from TexBel. Organic action plan dialogue with farm team.
Friday	26 Feb	Office day for the production of the report.
Saturday	27 Feb	Travel back to Costa Rica.

2. Key actions to be taken and goals for the next three months

2.1. First observations for the action plan

- There is already an extended explanation of the Conversion Plan strategy in the Mission 2 report, it is not needed to put it again in this report;
- Following a recent market opportunity for TexBel, there is an urgent need for organic certification;
- The current condition of the farms and the extensive area of TexBel farms requires a simple model so that it is efficiently implemented;
- A high volume of organic inputs will be needed to guarantee the good fertility of all of the farms;
- There is a big potential of biomass production on each farm which is an opportunity that needs to be well exploited;
- After evaluation of advances, the farms need to be boosted further in order to advance more quickly in the transition.

Based on these considerations, the technical recommendation is to develop a first-step action plan, based on a simple model, and on the Conversion Plan's goals (see Mission 2 report). First-step action plan main axes:

- Provide organic liquid fertilizer to the entire farms, with focus on Camalote;



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- Use compost tea system to feed microbiology into the soil, together with a green manure plan;
- Consolidate a regular easy routine for these practices, so that it can be adjusted and improved every year;
- Apply compost on the ground of every plot, or at least in new crops.

2.2. Compost Operation

- **A.** Move all the materials from the actual site to new site between block 13 and 12 in Texstar farm. All materials in this site will be arranged in a compost pile.
- **B.** Select decomposed material from the coconut husk pile and mix it with available fruit pulp, manure and shrimp heads.
- **C.** Establish a routine where all materials from the processing plant get composted every week.
- **D.** Get the shredder working immediately to process the remaining coconut husks.

Needs for the Compost Operation:

- 1 tractor with front shovel with a driver, dedicated to the Compost Operation,
- The shredder,
- 3 workers to give assistance to the tractor and operate the shredder,
- Small roof and storage place on site.

Goals:

- All the materials get transferred to the new Compost site before mid-march.
- All the materials from the processing plant get composted every week.
- At least 40 m³ of compost is made every week.
- By the end of march, the Compost Operation has a running routine, records and compliance with NOP standard.
- In 2022, develop a bigger Compost Operation to process at least 3.000 m³ of compost per year in the next years, and over 10.000 m³ in upcoming years.



Figure 1: Possible new compost site between block 13 and 12



2.3. Liquid fertilizer making

It is crucial to develop a Liquid Fertility Plant (LFP), to feed all the farm needs

- A. Produce at least 1 tank of 2.500 L of liquid fertilizer with the static tank system
- B. Put in to work all spraying tanks available, and made possible that at least one tractor is fully dedicated to spraying liquid fertilizer.
- C. After 4 weeks of fermentation start spraying of 2.000 m³ (harvested form each tank) to every 40 acres. Daily production of small Biodigester DEMO has to be sprayed from week 1 of march.
- D. Design biodigester unit of at least 30 m³ to produce up to 1.000 L of Biol per day.
- E. Increase every month the production potential to achieve spraying all the productive acres to at least 4 times per year.



Figure 2: Revision of biodigester DEMO, fully working and producing 40 L of Biol fertilizer a day (left)

Figure 3: Installation of 1st 2.500 L static tank for liquid fertilizer (right)

2.4. Green Manuring with cover crop

The green manuring technique consists in cultivating the interrows with biomass, which are then mowed at their highest nutrition level when the cover crops are blooming.

This technique increases the organic matter on soil, and promotes biological activity under and over ground. This method can increase the soil fertility, and together with using Biol, compost and compost tea, can be a very successful system.



Needs for the green manuring:

- At least 1 tractor per farm to be able to maintain a rotation of mowing that follows an active decision-making process based on observation of the growth of the cover crops.
- Collect, buy and reproduce seeds of legumes to be added to this model.
- Leave the rows under the trees always clean. A crew of weederers will have a calendar to maintain the citrus / coconut trees circle clean, the growth of the rows should not affect the crop.
- Spray compost tea after each mowing.



Figure 4: Strip system, already in practice in Camalote, keep the row under the trees clear is key to be able to implement a successful green manure model.

2.5. Compost Tea

Compost tea is a technique used to distribute the benefit of compost in an easier and more extended way. It consists in a maceration of humified compost, using aeration and adding a source of sugar and minerals. The proposal is to put up a compost tea unit to be able to spray the crops and the cover crops.

Compost tea model is to be proposed and executed for April visit.

It is proposed to develop conditions to have compost tea reactors of at least 20.000 m³.

2.6. Develop a good supply of equipment.

For the proper development of the farms, it is needed that tractors are in good shape, for compost-making, fertilizers spraying and cover crop management.

It is suggested that an inventory of available equipment which mentions their status is developed and analyzed to decide which and how many units are needed.



Figure 5: Several tractors, spraying tanks and other equipment, out of work in the Texbel Farms

2.7. Execute a detailed cleaning campaign

For the certification purposes, it is key to retire from the farm any leftover of pesticides packaging, bottles, bags and boxes.

Any leftover of pesticide, like the ones identified during the visit in Camalote, have to be properly disposed, and a record of such disposal kept. Also, old equipment used to spray such products needs to be taken out of inventory.

In the other hand, increase the farm protocols on general cleaning, trash management, and residue separation has to be developed. It is proposed that a Recycle Program starts on the farm, as part of the cultural changes needed in an organic farming company.



Figure 6: Bottles, tanks and bags of old fertilizer found in Camalote

3. Certification procedures

Recommended steps toward organic certification

1- Get in touch and follow all indications from certification bodies, to start formal documentation.



2- Create a farm Organic Certification Folder with at least the following data (the following list does not represent a specific list asked by the certification, it can be extended according to information required by the inspector):

- Legal documentation of farm ownership;
- Farm maps and risk identification and actions taken to reduce risk (fences, barriers, etc.);
- Plot list, including, size, location, crop, last spray /application of pesticides;
- Other certifications;
- Consultation and training reports;
- Soil analysis record;
- Residue's analysis;
- Updated Conversion Plan (to be developed in the initial phase of contract extension, Mission 2 report acts so far as Conversion Plan Draft);
- Input list (security sheet, technical sheet and certification of each one);
- Compost and liquid fertilizer tracking and record keeping (production, use and storage).

Note:

The processing plant requires a special certification for organic processing.

It is needed to evaluate the actual condition of the plant, and start the certification process together with the farm.

A general training for the team is needed. A first assessment was undertaken during the 1st visit and the conclusions are available in Mission 1 report.

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