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JATROPHA CURCAS PRODUCT PLACEMENT TRIALS (PPTS) HAITI FOLLOW-UP

AGRONOMY SPECIALIST FIRST TRIP REPORT

June 2011

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AGRONOMY SPECIALIST FIRST TRIP REPORT

Contract No. EPP-I-04-04-0020

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INTRODUCTION

As stipulated in subcontract EPP-I-00-04-00020-00-04-SUBK-FFP-QUIN-1 under the Haiti Watershed Initiative for National Natural Environmental Resources (Haiti WINNER), subcontractor Quinvita conducted two trips to Haiti to oversee the implementation of *Jatropha* trials. Per the subcontract terms, this report synthesizes the information gathered during the first trip in May 2011, including:

- An assessment on the ongoing trial at Bas Boen
- An assessment on the ongoing trial in La Branle
- Recommendations on the large-scale planting of Reginald Noel
- A debriefing and discussion of WINNER's 2012 program

CENTRE RURAL DU DEVELOPPEMENT DURABLE (CRDD) BAS BOEN

Current Status

The status of the *Jatropha* trials currently being conducted at the Bas Boen CRDD is much better compared to the last visit in November 2010. It is clear that pest and disease management has significantly improved; as soon as pests and /or diseases appear, action is undertaken, with success. Agronomists also confirmed that in case pesticides are used, the effect on the present pest and/or disease can be clearly seen.

Most of the plants look free of any infections, apart from mites, which again or still have infected a considerable number of plants. Since no “real” acaricides are available in Haiti, this situation will most probably not improve.

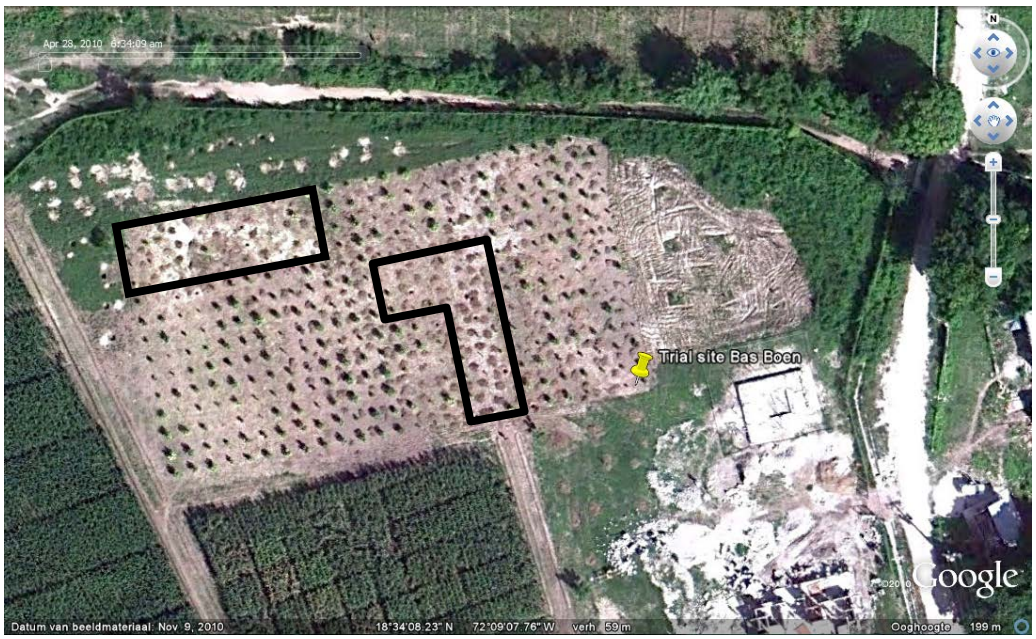
On various plots of the trial, plants still look very bad. Even plants which have been replaced in the past months (after the dormancy), don’t look good at all, although pesticides have been applied on these plants as well.

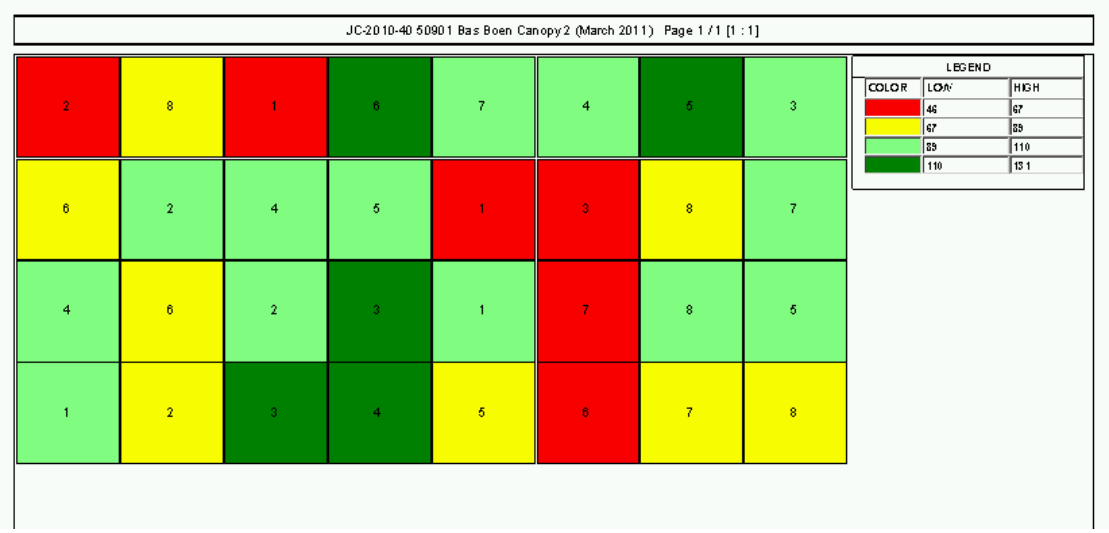
The reason for this is likely twofold:

- *Jatropha curcas* has a very good “memory”. Quinvita has experienced that if something goes wrong in the first weeks or months after transplanting, *Jatropha* will most probably survive, but will never perform as it should. From these specific plots (plot numbers 7, 11, 19, 20, 30-32) it is known that some of them severely suffered from waterlogging during the 2010 season (plot 30-32) and others from a flood (and waterlogging) due to the irrigation of a nearby trial (plot, 7, 11, 19 and 20).

- As was suggested by the agronomists, there is probably also a “subsoil” explanation for the ongoing problem. For example, it is possible that a hard pan is present in the subsoil, preventing roots from properly developing and causing water stagnation at root level. This can explain the limited resistance of these plants to pests and diseases.

Even on a Google Earth picture of November 9, 2010, the plots with bad growth can be easily recognized. This picture coincides perfectly with a trend map of the trial at CRDD Bas Boen of the canopy diameter (March 2011 observations).





A rain gauge has been installed at the CRDD. It was agreed that rain fall data will be sent on a regular basis to Quinvita.

Weed status is okay within the trial. It was, however, suggested to remove weeds at the border of the trial further away of the border plants. At some borders, weeds were only 20-30 cm away from the plant basis of the border row plants. Herbicides are currently not used because manual weeding is said to be still possible and weeds are

used for compost production. Attention must be paid that weed seeds are not being spread due to the use of this “weed compost”.

Drainage channels were dug as suggested and CRDD staff confirmed that they were helpful in getting water out of the trial area in case of heavy rain.

Recommendations

Soil sampling could reveal the soil nutrient status of the trial site as stated in previous reports, but could also reveal if there is a difference in soil permeability between certain plots. If no soil samples can be taken and analyzed, it is advised to test with an auger or spade, as differences in permeability can be found by probing the soil. If a hard soil pan is indeed causing these differences in growth and pest resistance, it will be possible to “feel” this during careful probing.

Based on the observations done during the visit, it has been decided to no longer do any observations on the plots 7, 11, 19, 20, 30, 31 and 32, since observations are not reliable and do not represent the average status of the plants in the trial. This means that for accession 1, only 2 replicates will remain in the trial and for accessions 2, 3, 6, 7 and 8, only 3 out of the 4 initial replicates will remain.

Quinvita recommends that the Bas Boen CRDD send rainfall data on a regular basis to their specialists for analysis. They also recommend that staff remove weeds alongside the border row plants and pay particular attention to the weed composting process to ensure that weed seeds are not inadvertently spread. Regular maintenance of the drainange channels is also an absolute necessity in order to protect the trial area from heavy rains.

Data

Some problems were encountered with the post-harvest processing. This was again discussed and questions were extensively answered. Due to some mistakes, monthly yield figures were not kept separate and only total yield data are therefore available (122 out of 288 plants yielded in the 2010 season). These data will be analyzed and presented in the first interim report to be submitted by Quinvita in August 2011.

During the visit it became clear that not enough plastic baskets are available for collecting, drying and weighing of the harvested grains per individual plant. Since this weighing should be done per tree and per month, at least 1 basket per tree is necessary. At the end of each month and after approval of the monthly data by Quinvita, harvested grains can be bulked per plot (e.g. in well-sealed bags or envelopes).

At the end of each season, Thousand Grain Weight should be determined and grain samples should be analyzed for oil content and fatty acid analysis. However, due to the very limited yield in this first season, it doesn't seem valuable to do these analyses on the first season's yield.

LA BRANLE

Current Status

General status of the trial is very good, almost perfect. Plants look very good, although first rains had only fallen recently. The trial also looks very homogenous.

In the border row, one of the plants is missing. Since this will influence the surrounding plants (through available light, space, etc.) it is strongly advised to replace this plant as soon as possible.

Plot numbers 17 and 18 both have a plant of a different accession as compared to the other 8 plants on those plots (plant number 2 on plot 17 and plant number 1 on plot 18). From now on, for both plants no observations should be done and "-9" should be filled out in the data files.

Pest and disease status is perfect. Almost no infections could be observed. On a few plants mites and mealy bugs were observed; therefore the advice was given to spray the whole trial. Weed status is also perfect.

A few days before the visit, new signs were placed at each plot indicating plot and treatment number. During the visit, it was discovered that some signs indicated the wrong treatment number, which can lead to confusion when doing observations. This must be checked and adapted as soon as possible.

There is still no proper fence surrounding the trial and preventing goats, cows, and other animals from entering the trial and damaging trees. As suggested in the previous trip report a proper fence should surround the trial as soon as possible.

A rain gauge has been installed on the CRDD. It was agreed that rain fall data will be sent on a regular basis to Quinvita.

Next to the trial a small nursery is ready to be established. This nursery will provide seedlings for a commercial planting of 50-100 ha close to the CRDD. Seeds have not yet been sown. According to the crop calendar, transplanting should be done in the coming weeks.

Recommendations

- Replace the missing plant in the border row and install proper fencing as soon as possible. Use cuttings from plants of the border row to raise filler plants.
- Fill out “-9” for both wrong plants on plot 17 and 18.

- Spray the whole trial against mites and mealy bugs. Up to now only one pesticide has been used. As long as the frequency with which pesticides are applied is low, it is ok to only use one pesticide. However, if application frequency increases due to infestation rate, it is much better to change pesticides (and active ingredient) in order to prevent resistance.
- Check plot signs and adapt according to field plan.
- Send rainfall data on regular basis to Quinvita.
- Regarding the nursery next to the trial: sowing and transplanting in the field should be done as soon as possible in order to still have a good growth and development in the first season. Furthermore, it is also important that pest and disease control in the nursery is done properly in order to prevent pests and diseases to spread to the neighboring trial.

Data

Some problems were encountered with the post-harvest processing. This was again discussed and questions were extensively answered.

During discussion it appeared that a balance with an accuracy of 100 g was used (see picture below). A vertical movement of 1 cm represents a weight of 1kg, 1mm corresponds with 100g. Taking into account that 1 grain weighs between 0.6 and 0.7g on average, it may be clear that a similar balance cannot be used at all for weighing the grains per plant. The use of this balance for determination of the 2010 harvest data explains the unexpected and unbelievably high result for the 2010 yield.

It is therefore essential that a new balance is provided with an accuracy of at least 1g. As soon as this balance is available at CRDD La Branle, the 2010 yield can be reweighed. Unfortunately, harvest has already been bulked per plot and per season. Therefore, only total yield figures per plot (and not per plant and/or per month) can be presented. As soon as the balance is available and correct weights have been determined, data will be analyzed by Quinvita.

As with the trial in CRDD Bas Boen, a set of plastic baskets is required in order to collect and dry the monthly yield per plant.

At the end of each season, Thousand Grain Weight should be determined and grain samples should be analyzed for oil content and fatty acid analysis. However, due to the probably rather limited yield in this first season, it doesn't seem valuable to do these analyses on the first season's yield.

Based on the data of 2010, it appeared that 14 plants yielded during the 2011 season while no flowering date was recorded for these plants. Data must therefore be rechecked and the correct data file be sent to Quinvita.

VISIT TO REGINALD NOEL COMMERCIAL PLANTATION

The commercial planting north east of Port-au-Prince was visited on May 23, 2011. The plantation consisted of 1 year old Jatropha plants (transplanting and direct seeding) together with newly being planted fields and fields that were direct seeded during the 2011 season.

Recommendations

The currently applied spacing is 2 x 2m. As discussed during the visit, Quinvita has evidence from various trials that wider spacings (e.g. 3 x 3m) result in a higher yield per ha, although considerably less trees per ha are present. Especially since plantations were said to be intercropped with vegetables in the future, it must be considered planting on a wider spacing, in order to give Jatropha plants more space, light, and nutrients to develop.

The currently transplanted seedlings were all cuttings. Quinvita has compared the growth and development of bare rooted seedlings versus cuttings (same genetics) and has found that trees originating from seedlings had more branches, a wider canopy and also up to a 30% higher yield. Therefore, Quinvita recommends to only use seedlings for transplanting.

Quinvita has not yet compared the use of direct seeding versus the use of seedlings, which it will do in the near future. At the time of the visit the plants originating from direct seeding last year (sown late 2010), looked quite well. Future will tell if direct seeding in Haitian hills is an option or not.

Seeds were said to be soaked in water mixed with fertilizers for 48 hours prior to sowing. Quinvita has investigated the effect of soaking on seed germination, but has never found any positive relationship. It is therefore not recommended that seeds are soaked.

Direct seeding (and transplanting) was also said to be done in the second part of the Haitian rainy season, being October-November. This is however very close to the start of the dormancy. Quinvita would like to refer to its crop calendar: sowing or transplanting in these months will inevitably lead to stressed plants. Since it is known that all kinds of stress in the very first weeks and months can and will lead to retarded

growth and lower yields, Quinvita advises to no longer sow or transplant in those months, but only within the planting window.

The currently used polybags are rather small. Quinvita advises the use of polybags of at least 30 cm tall and 15 cm diameter in order to have a good root development. Although the polybags were used for cuttings, which have a less developed tap root as compared to seedlings, the side roots still need sufficient space to develop. While collecting the polybag cuttings for transplanting, it could be observed that even side roots had grown out of the polybags. These roots can get damaged during transplanting.

Planting pits are advised to be at least 30 cm deep and 30 cm wide. Although Quinvita understands that this is not easy to achieve in the stony soil of the Haitian hills, it wants to stress the importance of these dimensions in order to avoid J-rooting at planting and to allow for a good root growth and development.

Fertilizers were said to be applied superficially to the soil. However, one must realize that apart from N, the other applied elements being P and K, are (quite) immobile in the soil and will therefore hardly reach the roots for uptake if applied on the soil surface. Furthermore, superficial application of fertilizers will also lead to run-off of the expensive fertilizers in case of heavy rains and plantations on slopes, which are both the case in Haiti.

The currently applied fertilizer is 20-20-10. It must be considered applying a mixture of 46-0-0 and 10-10-20 (as is done in the ongoing product placement trials) in order to apply a “V-shape” fertilizer blend.

DEBRIEFING AND 2012 COMMERCIAL PROGRAM

During a short debriefing session on May 25, most of the above topics were discussed. Some important issues that should be dealt with as soon as possible, such as the purchase of plastic baskets for collecting and drying the grain yield per (both CRDDs) and the purchase of a good balance with sufficient accuracy (CRDD La Branle), were discussed in more detail.

At the end of the debriefing, the WINNER 2012 program was shortly discussed. WINNER still would like Quinvita to assist with a training program to upscale the commercial planting in Haiti, which Quinvita is still willing to do. Last year Quinvita proposed an extensive training program based on the outcome of a day-long discussion with Chief of Party Jean Robert Estimé while at the Quinvita offices in Belgium.

Therefore, it was agreed during this debriefing that WINNER will also internally discuss the exact requirements of such a training program. WINNER will present a tentative program to Quinvita with details on how (and when) this training program should be organized and which parts should be taken care of by Quinvita. This will allow Quinvita to prepare a new proposal based on the requirements and prerequisites of WINNER.