# Growing yam in Guadeloupe : How much does it cost and how much does it pay?

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*carla.barlagne@antilles.inra.fr, francois.causeret@antilles.inra.fr, jean-marc.blazy@antilles.inra.fr - Tél. : 00 (590) 590 25 59 77*

## 1. Issue and aims

Yam is a long cycle (6 to 12 months) annual crop that is usually considered profitable in Guadeloupe as long as growing conditions are favorable. Nevertheless one has to invest a lot in the cropping system before one can make a benefit from yam farming. Additionally, the great diversity of plot locations and cropping systems in Guadeloupe result in quite different technical and economic performances. We illustrate them here with six typical crop management systems and further analyze their outcome under average price and yield estimates.

## 2. Description and results

The six crop management systems here were built with Ignamarge, a tool which enables characterization and simulation of technical and economic performance of yam production. These situations are delineated by cropping area, cultivated yam species, seed weight, staking of the crop, irrigation system and type of harvest. These characteristics are summarized in ***Table 1***.

There is a great variability in technical and economic performance within these six situations (Table 1). Gross product is always high (22 500€ to 30 000€) with a relatively low rate of change among situations (+33% between lowest and highest performance). Production costs are very important (11 496€ to 21 002€) and with a greater rate of change between situations (+83% between lowest and highest). This cost is due to contrasted farming practices. As a result, gross margin (gross product – production costs) ranges from high (8 631€) to very high (17 130€) with a high variability between situations (+98%between lowest and highest).

Situations T1 & T4 have the most contrasted technical characteristics in our typology. Gross margin for T4 is greater than gross margin for T1 by 6506 €/ha/cycle. This difference is best explained by higher costs for T1 because of staking (+4 042 €), preparing of seed tubers(+3 778€), harvesting (+994€) and weeding (905€), despite a higher gross product for T1 (+30 000€).These steps are the most expensive in yam management systems (***Figure 1***). With regard to the other technical and economic parameters, we notice three main points :

→ i/ Break-even point (minimum yield for which production costs are balanced by benefits) in T1 is about 11 tons/ha/cycle rather than 8 in T4 situation. Therefore T4 situation is fully balanced with a lower yield.

→ ii/ Unit cost of production for T1 is about 1.46 €/kg and 0.68 €/Kg for T4. So T1 needs a greater selling price to balance production cost than does a T4 situation (selling price has to exceed1.46 €/kg in T1 against 0.68 €/kg in T4).

→ iii/ Labor time required in T1 equals1115 h/ha/cycle against 564 in T4 (***Figure 2***). The difference is due to staking, type of harvest (by hand and double[1] in T1), and weeding (lower out-weeding in T4 because of faster ground cover with *D.alatavarieties*).

In summary, situationT4 is economically more efficient than situation T1. Some geographic location indeed allows for more favorable technical choices.

## 3. Limits and perspectives

In the light of this technical and economic analysis, yam is a demanding crop with regard to cash investment and labor time requirements, but whenever yields expectations are met (between 7 and 11 tons/ha/cycle) it is raising benefits whatever the situation considered. Nevertheless, some situations are more favorable compared to others (T3 has the highest gross margin). Moreover, it is especially important to consider that the different combinations of practices cannot be implemented in all farming locations. Those locations have indeed diverse constraints and potentialities (soil fertility, topography, rains, and pathogen contamination risks). It is only with a full and wise consideration of these parameters and their own economic goals that farmers will be able to make the best technical choices.

## 4. To learn more…

Causeret F., Barlagne C., Blazy JM., 2012. Ignamarge©: a technical and economic evaluation tool of yam production for decision making. Operating instructions.Version 1.01. September 2012, 8p. (In French).

[1]A double harvest implies that farmers first collect the tubers that meet market standards and then seed a tuber providing the leafy part of the plant has not been removed in between the two harvests.

***Table 1*** **: Characteristics of the 6 common yam management systems**

*A double harvest implies that farmers first collect the tubers that meet market standards and then seed a tuber providing the leafy part of the plant has not been removed in between the two harvests.

| Type | T1 | T2 | T3 | T4 | T5 | T6 |
|---|---|---|---|---|---|---|
| **Cropping area** | Basse-Terre | Basse-Terre | Grande-Terre | Grande-Terre | Grande-Terre | Basse-Terre |
| **Species** | *D. cayenensis* | *D.alata* | *D.cayenensis* | *D.alata* | *D.esculenta* | *D.esculenta* |
| **Staking** | Yes | No | No | No | No | Yes |
| **Irrigation** | No | No | Yes | Yes | Yes | No |
| **Type of harvest** | By hand, double* | Half-mechanized | Half-mechanized | Half-mechanized | Half-mechanized | Manual |
| **Weight of seed tubers (g)** | 130 | 120 | 90 | 70 | 70 | 70 |
| **Yield (t)** | 15 | 15 | 15 | 18 | 13 | 13 |
| **Labour cost (€/h)** | 11.31 | 11.31 | 11.31 | 11.31 | 11.31 | 11.31 |

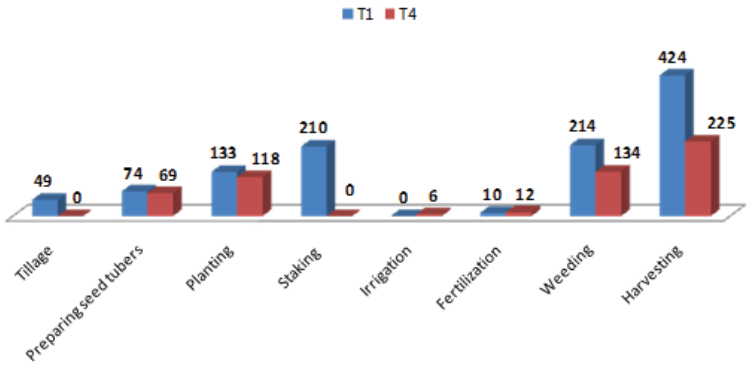
***Table 2*** **: Main technical and economic results for the 6 situations**

*Costs without structural costs and depreciation.

| Type | T1 | T2 | T3 | T4 | T5 | T6 |
|---|---|---|---|---|---|---|
| **Gross income (€/ha/cycle)** | 30 000 | 22 500 | 30 000 | 27 000 | 26 000 | 26 000 |
| **Gross margin (€/ha/cycle)** | 8 998 | 9 777 | 17 130 | 15 504 | 13 317 | 8 631 |
| **Break-even point (kg/ha/cycle)** | 10 979 | 9 119 | 6 791 | 8 189 | 6 819 | 9 162 |
| **Labor time requirement (h/ha/cycle)** | 1 115 | 710 | 574 | 564 | 613 | 976 |
| **Unit cost* of production (€/kg)** | 1.46 | 0.91 | 0.91 | 0.68 | 1.05 | 1.41 |
| **Cost* of production (€/ha/cycle)** | 21 002 | 12 723 | 12 870 | 11 496 | 12 683 | 17 369 |

***Figure 1*** **:** Distribution of costs for a crop cycle (8 months) for situations T1 and T4.


***Figure 2 :*** Labor time requirement (hours/ha/cycle) for a crop cycle (8 months) for situations T1 and T4



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