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Permacultural Organic Market Gardening and Economic Performance

Status Report # 2

July 2013

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Abstract:

In December 2011 a study of 3 years started at the Organic farm Bec Hellouin, to assess the possibility of creating a full-time activity by cultivating 1,000 m2 employing a permacultural organic market gardening approach.

The principles that guide the implemented production methods form what has been called "*the method of Farm Bec Hellouin*", available on the Farm website. These methods include in particular:

- cultivating a small surface area;
- the virtual absence of mechanization of labor, interventions being made mostly manually;
- the intensification of production on said surface area;
- all on a site created by drawing on permaculture principles, principles that could lead to the creation of very diverse places.

Halfway through the study, it seemed important to analyze the data collected by us, in order to identify initial lessons. Emphasis was placed on the analysis of the results for the workload and turnover, as these are two important data with regard to the creation of an economic activity. From this point of view, the results presented in this report are very encouraging.

In one year, turnover generated was 32,000 euros, for a workload in the gardens of 1,400 hours.

This is in line with the initial hypothesis:
1,000 m2 cultivated in permacultural organic market gardening can create a full-time activity.

Finally, for this stage, it seemed interesting to compare four perspectives: the views of the scientific director of the study, François LEGER ; the engineer in charge of field control, Sacha GUEGAN ; a member of the Scientific Committee, Gauthier Chapelle ; and the head gardener in the study taking place, Charles Hervé-Gruyer.

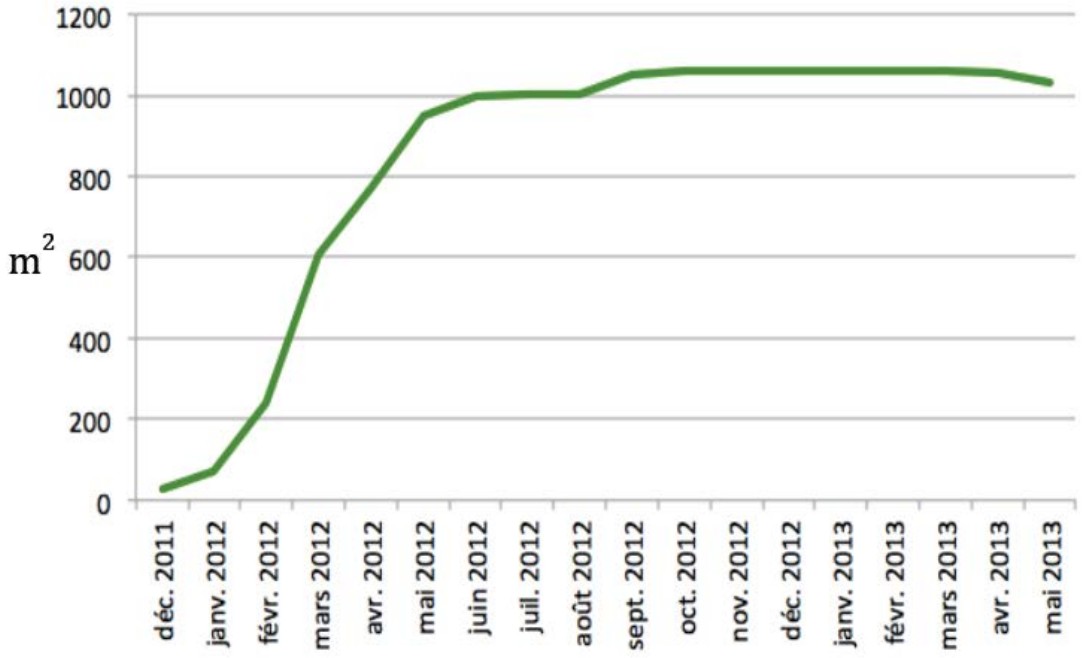
The point of view of the engineer Sacha Guégan

The initial phase

The study started in an area already in farm production. The parcels included in the study have been gradually increased, as and when the locations of new crops were introduced, until reaching an area of approximately 1000 m2.

The choice of plots included in the scope of the study was done in order not to incorporate plots that are too "atypical". Thus, sectors dubbed "Big Island" and "Small Island" on the maps were not included because they may be considered too specific and less common situations, due to the presence of pond ecosystems, and an edible forest system - creating particular microclimates…

The continued integration of the plots in the study was made until the fall of 2012 and completed in the following timetable:



Graph 1 (Above) : Surface Area (m^2) Cultivated in the scope of the study

Note 1: 62m^2 of additional field were integrated in November 2012. These plots are not considered in this report, which presents the results obtained from 1 June 2012 to 31 May 2013.

Note 2: The small decrease in early (April) 2013 surface area, corresponds to a redistribution of some plots ; to create plots of identical length, being more manageable for everyday gardeners. This meant slightly "shortening" some plots.

The plots are divided into sectors, corresponding to different geographical areas of the Farm. The study was conducted over 70 plots. These plots are all grown in permanent beds, of two types:

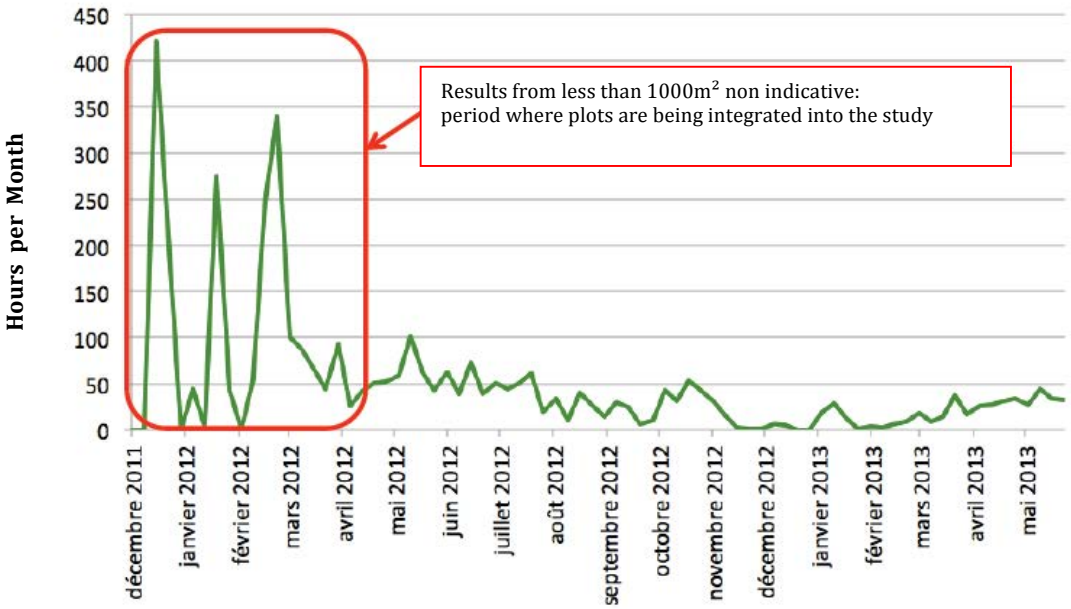
- wooden bordered beds, 80cm wide, especially suitable for sowing;
- the round mound.

The sheltered area is 40% of the total area. The table below summarizes the main data on the different sectors:

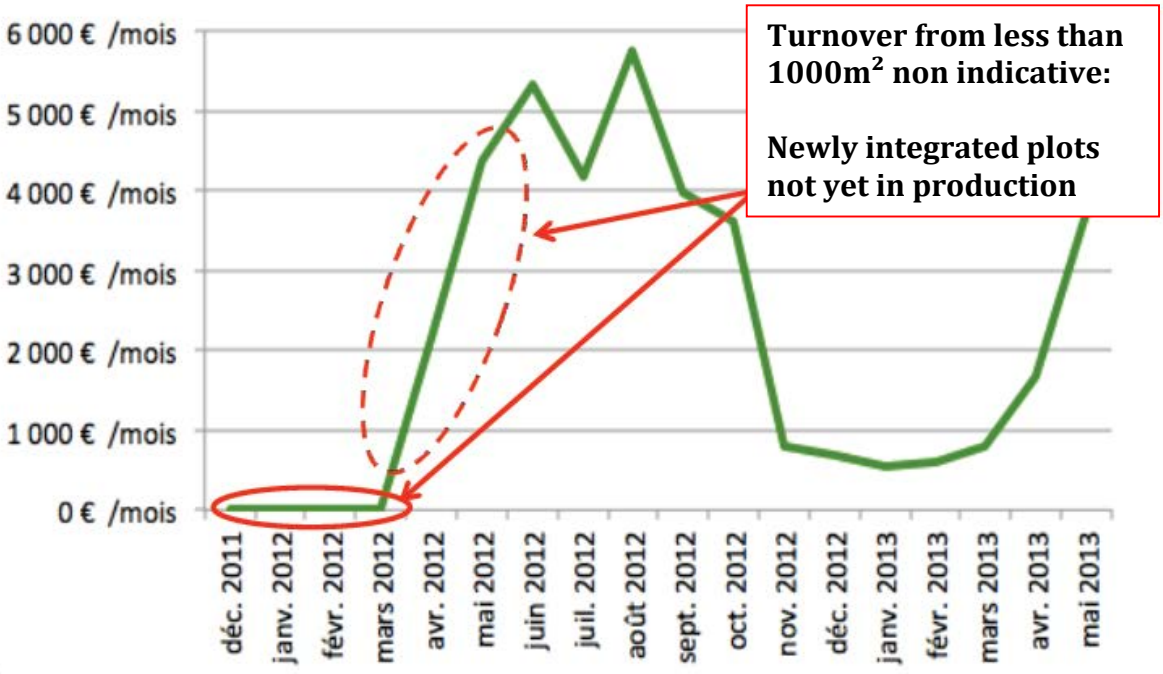
Sector Name	Description	Cultivated Area on 31 May 2013
Greenhouses	Undercover, wooden bordered beds	421m^2
Apple Tree	Open field setting, Wooden bordered beds, Set in the agroforestry area.	116 m^2
River	Open field setting, Wooden bordered beds, Set in the agroforestry area.	117 m^2
Mandala and Small Mandala	Open field setting, Round mounds, Set in the agroforestry area.	378 m^2

The collection of relevant information evolved during 2012, culminating in the record sheet attached. Each intervention on a parcel of the study site are noted with the type of intervention, the time and various other information specific to certain types of intervention (for example, for cultural establishments: number of seedlings planted, weight of seeds sown for crops: quantity harvested, ...).

The period before 1 June 2012 corresponds to the start of the study, with a surface area still significantly lower than 1000 m2 it effects the results as the study area is brought up to 1000m2, as shown in the two graphs below:



Graph 2 (Above) : Hours of Work per Week



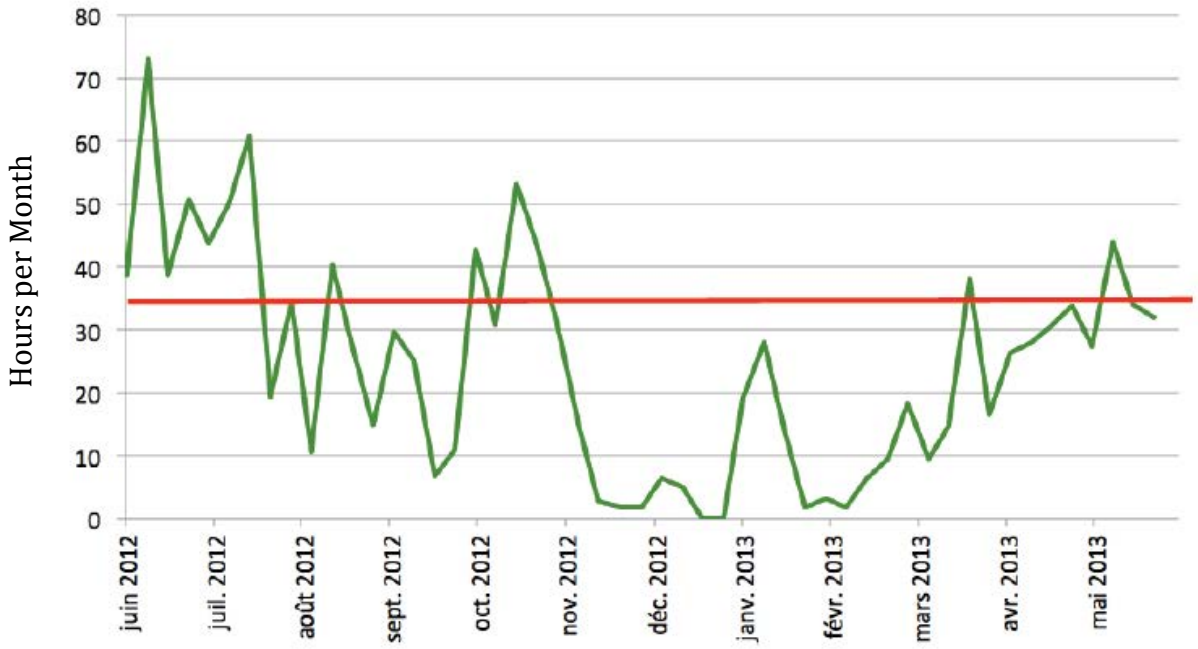
Graph 3 (Above) : Monthly Sales (rising to 1000 m2)

In the following report, the results are based upon the full 1000 m2. The results presented correspond to a period of one year running from 1 June 2012 to 31 May 2013.

Workload

One of the characteristics of the production system is the virtual absence of mechanized or motorized work, work primarily by hand. It was therefore essential to confirm or refute the hypothesis that the workload induced 1000 m2 corresponds to a grown person.

Data for one year:



Graph 4 : Weekly Workload

Peaks in workload can be explained by the fact that gardeners often work on the farm at the same time. Some weeks, they will spend more time on the study plots, resulting in a worlkload peak, contrasting for example with the following week, where they have spent time working mainly on plots outside study area.

In order to have time for non-production tasks (general site maintenance and equipment management, marketing, ...), it seems reasonable to aim as much as possible for a weekly time in the gardens up to 35 hours. This 35-hour threshold is the red line.

In one year, the time spent in the garden is 1400 hours .

We can clearly see on the chart the hollow in winter, and peak loads in summer and October. 50% of the workload corresponds to greenhouse crops.

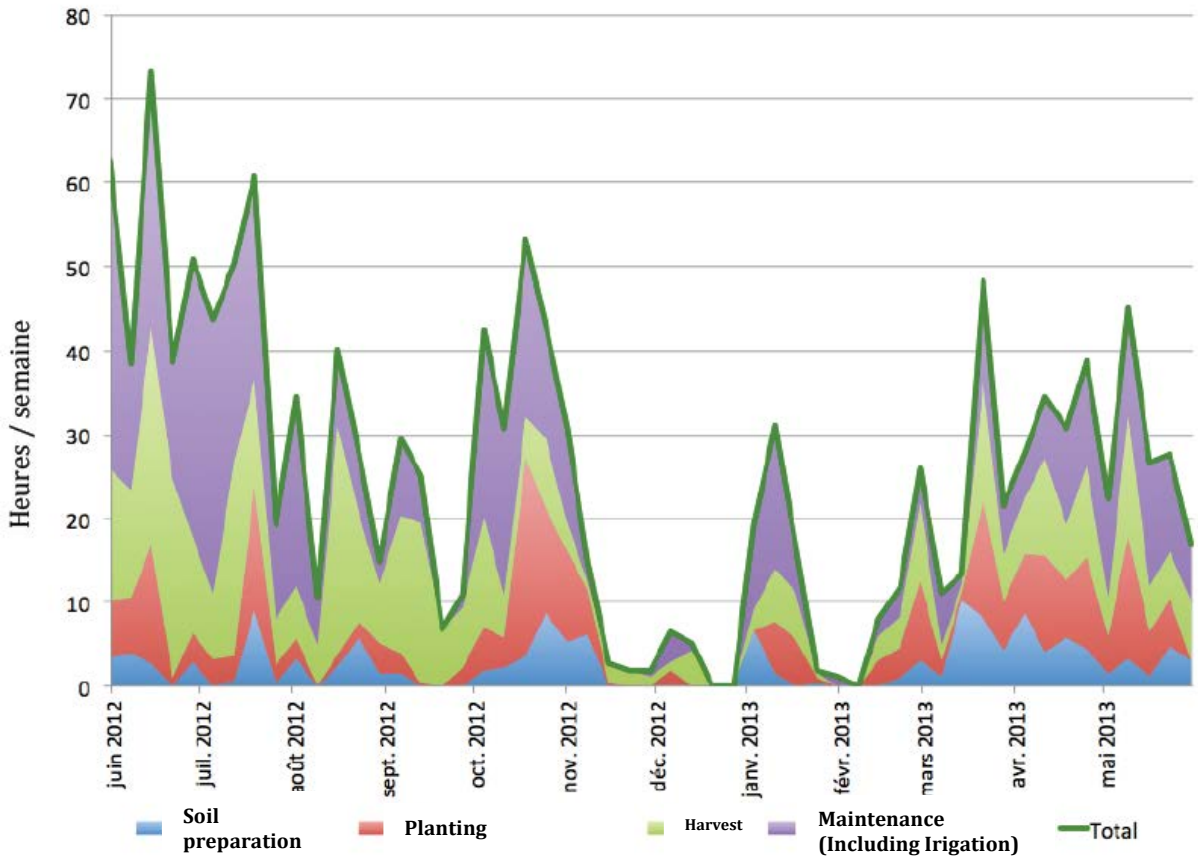
With regard to the workload, the conclusions that can be drawn from this first year are the following:

- Workload is broadly consistent with other tasks to be performed on the Farm. If we count 1/3 of the total working time for those marketing tasks, management, general maintenance, etc ..., we get a total of 2,100 hours over the year, which corresponds to the lower range that is conventionally accepted in the profession;

- Peak workload in summer is also usual in the profession. It is managed by increasing the weekly working time, by balancing the one-week workload on the other when possible, and if necessary employing additional temporary personnel;

- The peak load observed in October essentially corresponds to weeding, and can be managed in the same way.

Going further into the details of tasks performed, we get the following graph:



Graph 5 : Working times (and activities)

For each category of tasks, working time are also collected for the sub-categories listed below:

- Soil preparation: mechanized preparation (tiller); non-mechanized preparation of ground; mulch (the type of mulching, organic or inorganic, is also relevant);

- Crop establishment: sowing time; planting time; number of plants / seed weight;

- Harvest;

- Maintenance: weeding; fertilization / treatment; physical protection (Handling P17-type membrane tissue fabric and mini tunnels /cloches); other;

- Irrigation (here integrated with maintenance tasks): this is the time related to irrigation operations (manual watering with watering can, installation of drip-pipe or sprinkler pipes, ...), which does not include the time irrigating the crops by automatic systems (whose management takes very little human time: turn on / off the pump, ...).

A more detailed analysis of workload peaks shows that the peak workloads associated with an increase in the time spent tending crops is linked to weeding. This brings two points:

- The weeding work requires no special qualifications; so it is easy to find the manpower to accomplish;

- In 2012, the status of the time spent weeding walkways had not been clearly defined: maintenance of crops on neighboring plots or general maintenance of the site? When in doubt, gardeners have affected this time to weeding the plots bordering the fairways. For 2013, following a clarification with François Léger, it was decided that weeding walkways in fact corresponded to the general maintenance of the site. This implies that the weeding time of plots was overvalued in 2012;

Turnover

The collections made on integrated plots in the study are identified (type of vegetable, harvested weight or number of pieces). The turnover of the plots of the study is calculated from these data and the prices recorded for the organic market gardening in Upper Normandy region by the GRAB (Regional Group of Biological Agriculters) on the one hand ; and the prices charged by conventional wholesalers and organic sellers on the other.

In 2012, the farm has had marketing problems which have resulted in:

- Production exceeding demand. This has driven prices down (reflected in actual prices charged by conventional wholesalers) un-salable products were offered to charitable associations, while in the last extremity finished in the compost. Until August 2012, donated crops, or those turned to compost were not accounted for, and therefore not valued. Since this study is a study of the production, it was decided not to disrupt the results with marketing problems. So from August, the crops were all recorded and valued as indicated above, they were either sold, donated or made into compost;

- Lower crop intensification. Indeed, for autumn and winter crops, with the lack of trade opportunities, the amount of crops grown were reduced. Both the greenhouse plots were fully grown however, while plots in the field especially, were only partially cultured compared to what could have been done. For comparison, during the winter 2011-2012, the Farm produced over 100 weekly baskets, against only twenty during the winter 2012-2013.

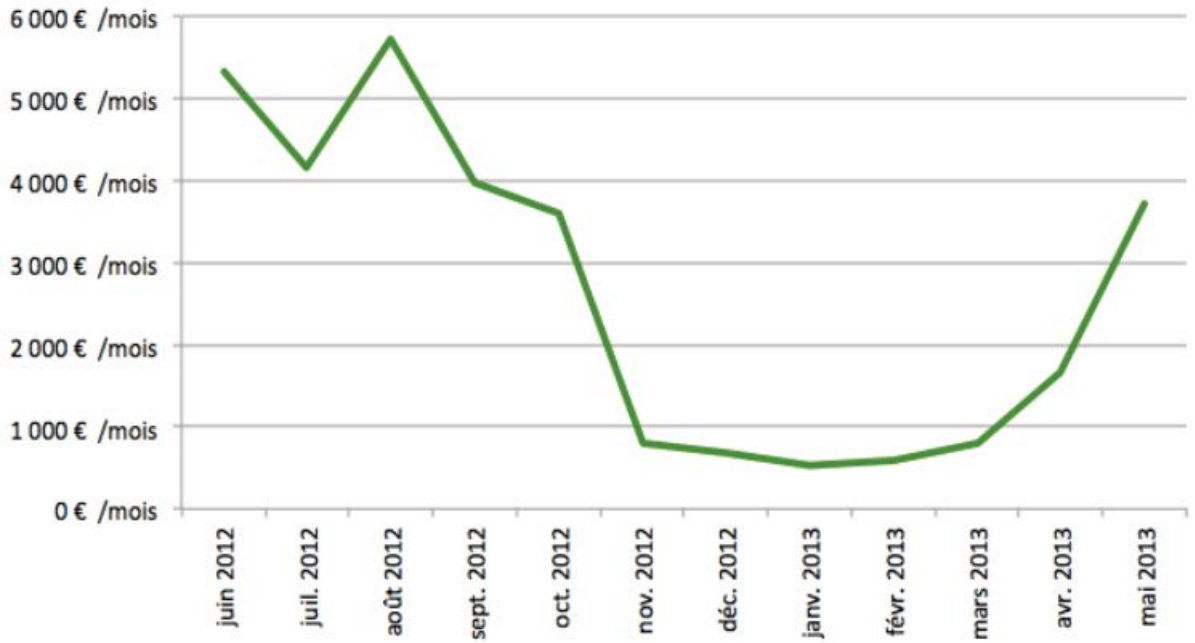
To these marketing problems were added the difficult weather conditions:

- the season was particularly cold and damp in 2012;

- 2012-2013 winter was particularly long. That delayed the implementation of spring crops, being a month late.

We see that the sales generated corresponds to a mediocre year, with rather underestimated results.

Over the period studied, the monthly sales was as follows:



Graph 6 : Monthly sales

In total, data analysis gives the following results:

For the year, the turnover generated is 32,000€

Brought back to 2100 working hours in the year (production, management, marketing, general maintenance, ...), this gives a rate of 15.20 euros /hour.

Analysis of the data by sector, or plot by plot highlights significant disparities in turnovers generated per m2:

	Annual Turnover			
Sector Name	Plot Minimum	**Average**	Plot Maximum	**Comments**
Greenhouses	16.60€/m²	**45.30€/m²**	106.90€/m²	Under cover Wooden bordered beds Plots often visited
Apple Tree	19.90€/m²	**37.20€/m²**	54.80€/m²	Open field setting Wooden bordered beds Half the plots rarely visited Set in the agroforestry area
River	6.60€/m²	**20.80€/m²**	34.80€/m²	Open field setting Wooden bordered beds Half the plots rarely visited Set in the agroforestry area
Mandala and Small Mandala	2.00€/m²	**13.20€/m²**	40.30€/m²	Open field setting Round mounds The least vsited plots Set in the agroforestry area

Greenhouse crops generate the most turnover per m2 of sales on average.

It is interesting to note that:

- Over a sector away (and therefore the less visited), the lower the average turnover per m2. It is likely that the Apple Tree sector, for example, just outside the greenhouse and the tools shed/harvest store, unwittingly receives more attention thqn for example the Mandala area which is located at the bottom of the Farm;

- the Apple Tree area enjoys a sheltered wooded context: it is situated between apple trees. Regardless of the agronomic aspects of the presence of trees, the increased turnover is simply generated by harvesting apples;

- the Mandala area ; growing in round mounds is not necessarily linked to its lower productivity: the islands (dubbed "Big Island" and "Small Island"),

discussed above, which are not part of the study because they are considered too « atypical », are considered highly productive and are also grown in round mounds;

- Other factors can impact the cause of greater or lesser productivity of each sector: type of crops located there (more or less revenue-generating business), soil fertility, ... It is likely that a multitude of factors influence in one direction or in the other, the figures presented above.

If one goes down to the field level, we see again in each sector great disparities. They are due at least in part to types of crops located on the plots in question, but also the degree of intensification achieved through intensification of seedlings and plants, or, for example through crop associations.

For example, the following can be mentioned:

	Annual Turnover			
	Plot Minimum	**Average**	Plot Maximum	
In Greenhouse	**16.60€/m²** lettuce -Cabbage then Okra – Basil then lambs lettuce then beans	**45.00€/ m²**	**106.90€/m²** **Peppers – Basil** then lettuce - turnip - radish	
Open Field	**2.00€/m²** lettuce then Siberian kale	**21.00€/ m²**	**54.80€/m²** radish – carrot then turnips - chicory	**courgette** then brussel sprouts

Some cultures have proved very profitable, and especially since they were conducted in association (basil - peppers in greenhouses on several plots; Zucchini in the open field, but with the problem of managing the production peak; and radish -carrots).

Other results are very low. This can be explained by failures of crops, for non compatible crops - therefore not salable (before August 2013: lettuce plot 16.6/m2 ? Okra), or by not very profitable crops (Siberian kale).

Details of the vegetables grown in the integrated plots in the study is annexed, with the turnover they generated.

Estimated gross margin, initial investment and result

In 2012, production data (time spent, harvested quantities, ...) were recorded directly and linked to the sale price to value production. This was used to calculate the turnover generated.

It is of course interesting to go beyond simple turnover to calculate the gross margin generated by 1000 m2, or net income. The data collected in 2012 does not allow this. An estimate has nevertheless been attempted based on the data available for the **whole** farm. It is only an **estimate**, intended to give a few orders of magnitude, and not precisely quantify the financial data.

The estimated operating expenses for 1000 m2, from the data of the entire Farm, gives:

Net Yield	**32,000€**
Fertilizer, amendments, plant treatments	1,100€
Seeds and plants	4,000€
Miscellaneous supplies / Sundries	550€
Total Operating Costs	**5,650€**
GROSS MARGINS	**26,350€**

It is also interesting to make a list of equipment that was used for the production of the 1000 m2, especially in order to obtain an estimate of the financial effort required during startup. A first approach was made, to be refined in 2013:

Polytunnels/ Mini-tunnels /Cloches	13,000€
Hand tools	1,569€
Tarpaulins, geotextiles, membranes	802€
Irrigation materials	2,364€
Plant material and seedlings	920€
Clothing and protective gear	48€
Packaging	500€
Other	4,524€
TOTAL	**23,727€**

For a person on his own, it gives the following draft income statement:

Net Yield	**32,000€**
Fertilizer, amendments, plant treatments	1,100€
Seeds and plants	4,000€
Miscellaneous supplies / Sundries	500€
Total operational costs	**5,600€**
GROSS MARGIN	**26,400€**
Depreciation	3,770€
Other depreciations (land /vehicle)	2,000€
Payroll operations	3,500€
Other Charges (Electricity, water, fuel, insurance, tax…)	3,000€
Results	**14,130€**

Note: In the above table, the equipment was amortized over 8 years for greenhouses and 5 years for other equipment.

As discussed later in this report, one of the objectives for 2013 is to quantify more precisely, the operating expenses in order to refine the above figures which are only **estimations.**

However, these estimates suggest that even a mediocre year, with people inexperienced in gardening, it is possible to generate income on the order of a SMIC (Minimum Salary for Interprofessional Growth).

Conclusions for the past year and work areas in 2013

The main results of the first year are:

- A turnover in excess of 32,000 euros
- For a workload in the gardens of 1,400 hours
- And a mediocre year.

This is in line with the initial hypothesis:
1,000 m2 cultivated as permacultural organic market gardening can create a full-time activity.

Working priorities selected for 2013 are:

Steps towards more intensification:

- lack of market outlets a priori are not a problem in 2013, setting optimal culture for every available surface, including winter crops.

- go further in vegetable associations to further increase production per m2 but ensuring hourly productivity.

- continue to explore the terraced systems, which again, when they are well designed allow increased productivity per m2.

Having the same level of care for all plots, making sure not to neglect the more remote plots (plots that seem less visited).

Improving the efficiency of manual work, rediscovering or by developing tools adapted to farming methods used on the farm, that will work better and / or faster.

Quantify more precisely operating expenses: Cost of plants and seeds, fertilizers and amendments costs, ...

Refine the list of equipment to consider when installing.

Describe and analyze more qualitatively what is special about this type of gardening.

The farmer's perspective
Charles HERVE-GRUYER

An original context

The " Permacultural Organic Market Gardening and Economic Performance" study has several original features, it is the first one to take place on a farm in production – the Bec Hellouin Organic Farm, which is also a training facility that hosted about 400 trainees in 2012.

This environment presents opportunities and poses constraints.

Opportunities for the requirements for the production of vegetables, 12 months out of 12, fruits, berries, herbs ... actually "glue" the study to the reality of life on an organic farm, with its ups and downs. We live from the sale of production and the sting of economic performance is very real, to survive in a difficult environment.

Constraints, because 2012-2013 was a year marked by an unfavorable meteorological context (freezing at -18 °, exceptional rainfall ... even for Normandy!), and trade difficulties (a proportion of the produce not was sold), we have devoted much time and energy to keep the farm afloat, sometimes to the detriment of time. Perrine, my wife and collaborator, and I could have spent money to advance the study.

Opportunities, as the almost continuous stream of interns and external trainers brings a multiplicity of perspectives and skills on the topics we study.

Constraints because the explosion in demand for training and counseling interventions in 2012 also contributed to move away from more gardens than we would have liked, to the detriment of production that could be optimized.

2012: Start year

Data collection began in December 2011 and has continued without interruption ever since. Our team of gardeners and ourselves are trained to the necessary rigor for the collection of information, which may be flawed at the risk of inaccurate results. For all of us it was a new task. I must salute the commitment of everyone because, whatever the weather, the level of urgency, the multiplicity of individual steps, data scoring has been constantly performed with seriousness and rigor.

The processing of such data, during this start-up year, was more difficult. The study focuses on a complex object: 70 parcels totaling 1000 m2, hundreds of cultivated varieties, crop sequences that overlap because of crop associations ... modelling a complex system is a challenge. The creation of data collection sheets, the definition of protocols required 18 months of trial and error and meetings, sometimes with changes of order to best adapt these protocols to the objectives of the study. The team in charge of data processing was affected by a lack of initial training, which meant there became a need to verify all the information twice, first by a technician INRA Sacha Guégan, to arrive at reliable and usable results. For our field team, these gropings have seemed very long, but to François Léger, our chief scientist, they are inherent in emerging agronomic study of normal standards.
In June 2013, it seems we finally got out of the startup difficulties and moved serenely on a marked path, finally.

The first results of the study

The hypothesis that initiated the study: « 1000 m2 cultivated in permacultural organic market gardening can create a full-time job, » will radically counter to the current trend. It leads us to explore uncrowded ways and requires a certain dose of audacity to challenge the dominant thinking in the field of organic and conventional agriculture, namely that one "is doing better" by being big and well Mechanized. We seek instead to put into practice the advice of a Parisian gardener of the nineteenth century: "Choose the smallest plot of land as possible, but grow it exceptionally well."

Choosing to do almost everything by hand is iconoclastic in times dominated by the machine! To achieve this goal, we cumulate a number of handicaps:

- Our inexperience and our lack of initial training at our facility in late 2006;
- An area less suitable for vegetable crops;
- Weather and market challenges mentioned above;
- The absence of references in Europe in this type of farming, permaculture having met very few the world of organic farming to date.

Given the inherent slowness in the development of new modes of agricultural production, the results of this first year of the study can only give, at best, an indication of the relevance of this approach.

These initial results are strong encouragment, however. They suggest the possibility of living the art of organic vegetable production on a very small area, with low investment and reduced operations costs, an undeniable quality of life, a decent income, and satisfaction to practice biologically inspired agriculture that contributes to the regeneration of the area.

This type of permaculture agriculture, indeed, creates humus, rich wild and cultivated biodiversity, stores carbon in trees and soil, beautifies the landscape and create favorable microclimates in the development of life.

On the social level, besides the benefits mentioned above, it emphasizes that micro bio-inspired agriculture opens a new gateway to the agricultural world, so difficult to penetrate. Creating a farm requires less land and less investment, which can greatly promote the development of urban and peri-urban agriculture. It is an agriculture practiced with great respect for the land, which corresponds to a need for meaning and renaturation of our living spaces, reconnection of our citizens to nature, its cycles, their health. From all this arise enriched social links.

We can add to the above, that the study provides evidence of the potential productivity of agriculture, which is in the meaning of life and trying to get the most of ecosystem services. To an abundance of production, it is also necessary to add quality. Since the establishment of the farm, we get many testimonials from consumers, organic shops and restaurants on the taste of vegetables grown in very natural conditions. Since 2012, we have the confidence of three chefs who recognize the value of our vegetables, so much so that in 2013 an important partnership was set up with the recruiter Sergeant, a new restaurant in search of excellence valorization of natural products, which joins our own quest for excellence in our production. It seems to be very far yet, we are only in the first step of the way, but this recognition appears as a further validation of the relevance of this work.

From a commercial point of view, after 2012 a year marked by unsold produce, partly not valued in the study (which pulls the economic results down), we live in 2013 the opposite situation, with a request that we fail to satisfy. We are no longer forced to sell our vegetables (last year they were sometimes sold at the price of conventional wholesalers!), But, for the study, production is still valued at the average price of the profession for Upper Normandy.

A key opening

Beyond the technical and economic results, we find that this study reinforces a new conceptual path. It is customary in our Western thought, to oppose productivity and environmental protection (a confinement denounced by the very recent report by Marion Guillou on agroecology). We note that a bio-inspired agriculture generates an abundance of quality products. Go to essence, it can produce more and better. Bio-inspired agriculture is sustainable and regenerative by definition.

Replacing the machine (and therefore fossil fuels) by the human hand, under certain conditions and in the context of our diverse gardening poses constraints, but offers significant opportunities, as we seek to realize what the machine can not do:

- Take extreme care of the soil;
- Associate plant cultures;
- Densify plant cultures.

This is great news for all those preparing the transition to a world where oil is scarce and expensive. The « normalization » of micro permacultural farms can guarantee local production, abundant and sustainable, organic quality products.

A Micro Farm of One Hecatre

In conclusion, we emphasize the vital role of trees at the farm of Bec Hellouin. All our outdoor crops are conducted in agroforestry. Even in the greenhouse we grow vines and seek to settle there tiered (stacked) plant assembilages. The current study did not measure the impact of this system on vegetable orchard production, that is an exciting avenue to explore. This will be the subject of a study on the vegetable orchard - starting soon.

One study followed more

We receive a number of exponential stress, not always easy to manage, private, communities, organizations. The study appears of great interest and it seems that an increasing share of the company is open to new paradigms. Thus Perrine (my wife) will present the study in Brussels at a symposium on agroecology organized by the European Parliament, François Léger and I did the same at the conference on bio-inspired research organized by the Ministry of Environment and Natural Museum of Natural History. The farm is presented in a IFOAM booklet (see www.ifoam.bio) on agroecology and has received the trophy of Sustainable Agriculture for Upper Normandy. News reports and television programs are numerous and no less than 10 published or in preparation books evoke the farm.

We come to think that the main merit of the study, beyond the technical and economic results, is to open the field of possibilities, to give credibility to an alternative "work". We hope that an increasing number of farmers dare to explore the potential of bio-inspired agriculture "because they did it, why not us? ". The sharing of information and experiences will leverage the impact of this research, and will contribute to the invention of post oil agriculture.

The view of researcher
François Léger - Director of SADAPT unit
INRA AgroParisTech

The "Permaculturel Organic Vegetable Farming and economic performance " study grew out of the conviction of Charles and Perrine Hervé Gruyer, that a person, working mostly alone could generate a decent income by cultivating a very small area, and led to a form of combining organic gardening with the principles of permaculture (general design to maximize resilience and autonomy of the agro-ecosystem ...) and North American intensive organic gardening (John Jeavons, Eliot Coleman).

If it were to be, such a hypothesis would be an interesting base to consider sustainable alternatives to agriculture. It therefore deserves to be supported by accurate and reliable data. But what data to collect, and how to collect them? The first step of this study, which is associated with the research unit SADAPT (AgroParisTech-INRA), was to establish a reliable and efficient protocol to collect the information necessary to demonstrate the initial hypothesis. This objective was achieved during the internship Master 2 "Environment, Development, Territories, Societies'" Morgane Goirand. The collection system implemented has produced data emphasized in this document. It is also the basis for the project to create a collaborative website, in which voluntary farms could record their own data. They would feed a collective basis, from which it would be possible to multiply the study conducted at Bec. Farmers participating benefit from treatment for their routine, to produce for their farm outputs comparable to those presented here. The realization of this site will mobilize additional financing, as part of the project CASDAR "Maraichers Agroforestry Systems" which involves UMR SADAPT.

Beyond these methodological and practical dimensions, the course and last year, also helped to initiate reflection on the conditions of use in a singular experience like that of Bec Hellouin. From the start, we set a goal to use the data generated to calibrate a model of ecological and economic viability of vegetable micro-farms. Such a project requires first of all to build a stylized conceptual model, identifying the relevant variables to characterize it. This step is still in its infancy. Observations made at Bec already allow us to offer a general organization of this model: the system considered consists of the "landscape" cultured, composed of a set of plots (or boards) on which culture associations succeed over the time. Thus defined culture sequences may be characterized:

> (i) of the input variables, qualitative or quantitative: previous crop; cultivated species; consumptions (seeds and plants, compost, natural mulch, fertilizers, treatment products ...) working time,
>
> (ii) output variables: vegetable products with their sales price, following sequence ...

The arrangement of variables in a mathematical model will measure the economic efficiency (measured by the level of margin and labor compensation) and ecological (measured by the degree of autonomy and diversity index) virtual cultivated landscapes,

simulated by the model. This work will be at the heart of the thesis proposal defended by Kevin Morel, funded by the Region Ile de France.

The study launched at Bec Hellouin, and this is undoubtedly one of its main success has been the starting point for a broader set of work that aims to offer all the elements for building systems combining gardening and fruit growing on very small surfaces. In these systems, the attention to cultures and their overall design would maximize biological interactions and thus obtain a significant level of income, with a high level of productivity and a very low consumption inputs and fossil energy. These models, because they require more thought and work than capital, are prime candidates to revitalize agriculture in areas which it felt excluded (cities and urban suburbs in particular) contribute to the reconstruction of all food systems by linking producers and consumers, participate in job creation.

The first results obtained at Bec are ultimately very convincing despite a difficult year, we invite all the more to continue the work in a permanent and equal dialogue between researchers. This actually quite special and rare situation will be, without a doubt, another essential element to produce results.

The point of view of a naturalist biomimtist
Gauthier CHAPELLE

I have not seen the farm "with my own eyes" since the first time that, (cold) June, before returning in early July for presenting the report. My testimony is fresh; less "objective"; More anecdotally, "qualitative" and subjective; and therefore complementary? I décline in several reactions, a mosaic taken with the usual precautions, but can however - I hope - provide additional insight to appreciate an initiative based on, and reflects so well, the complexity of the living world .

My first reaction will be based on my naturalistic passion: I was immediately struck by the significant presence and diversity of wildlife present on the farm (not to mention the diversity of domesticated species and varieties). If this biodiversity is partly based on the assembled habitats of this small area (running waters, stagnant, meadow, brush, wood, etc.), I would like to share two observations, however, possible to give a minimum of flesh which is an initial instinctive feeling.

The first naturalistic observation for birds, particularly a sub-group of sparrows, a granivore family par excellence, that of Finches (one of the best known is the lark). To my surprise, the 2-day mid-June have been enough for me to watch 7 different species (1) or all theoretically possible nesting in this piece of Normandy. But all on a viable farm! Waw! And in a context of increasing scarcity of once common species (such as the Linnet and Bouvreuil (2)).

The second relates to the noting of the ephemeral presence of insects already, and several species of dragonflies, the virgin caloptéryx, certifying the ecological quality of the aquatic environment of the farm. But I was especially challenged by the abundance of a red and black beetle very special, the Clarion of bees(3); adults were present on many different flowers occupying the vegetable forest garden - grazing and thus pollinating more ... especially significant: their larvae are parasites themselves several solitary bee species, obviously sign a massive presence of the latter on the whole farm. When we know their importance in terms of pollination, complementary honeybees, one can only rejoice ... Beyond these initial observations, I can only recommend to refine knowledge and evolution of this fauna on the different plots: that is there job! And that would certainly enchant students...

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1 The Chaffinch (Fringilla coelebs), the European Greenfinch (Chloris chloris), the Goldfinch (Carduelis carduelis), the Linnet (Linaria cannabina), the Canary (Serinus serinus), the Bullfinch (Pyrrhula pyrrhula) and HAWFINCH (Coccothraustes coccothraustes)
2 Decline of 60-70% in France over the last 20 years
3 Trichodes apiarius. For comparison equally anecdotal: in 2 days in June, I have observed at least twenty individuals. 3 times more than all the Belgian observations receipts through the platform www.observations.be form between June 1 and July 15!

My second reaction is more related to my agronomist drive, who is worried about climate change and our collective addiction to fossil fuels. If Charles can already tell in his "farmer's point of view," I would like to emphasize this: without being an absolute expert, I believe I have not seen anything or heard in our northern countries, on this scale, which goes so far in the direction of a market gardening weaned of oil dependency. Certainly there is still a way to go, yet saw the use of plastic and a little mécanisation (4) but for the first time, I felt that this vision did not seem unattainable. It remains to develop it!

This brings us besides also to the importance of ecosystem services provided by this approach to gardening. Beyond their enumeration by Charles, I think it would be useful to give a biophysical quantification in the future. Not so much to transform them into euros (could we get out of this logic of excessive financialisation? Wide open question ... in a forthcoming report?) Than to simply highlight them and contrast this regenerative approach flows (like all other ecosystems, you would say biomiméticiens) with the approach of industrial agriculture, extractive and gradually exhausting the organic fertility stocks, carbon, phosphorus, fossil fuels, biodiversity, etc ...

There would be much to say ... I still would add a point which seems to me at least as important as the others: why do I want to encourage more of my compatriots to visit (5)? One word: the beauty of the place. Produce an abundance of food, diversity, quality, and increasingly in beauty !!! But what more can we wish for?

Gauthier Chapelle
July 18, 2013

Gauthier Chapelle is naturalist, agronomist, doctor in biology and dad. He co-founded the international association Biomimicry Europa and engineering Greenloop, based in Brussels and based on biomimicry.

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4 But biomimetic solutions are or will be available to address these two issues: the bio-plastics vegetable sector is evolving, although it still must itself be bio-sourced from a regenerative agriculture and not industrial; same thing for potential biofuels on the committed products, as is done already elsewhere (see in particular the Land Institute's work on Sunshine Farm Project, http://www.landinstitute.org/vnews/display.v / ART / 2000/08/01 / 377bbca63)
5 We were 12 Belgians have made the trip this July 5, including one representing the innovation support in the Brussels region ... for urban agriculture.

Concluding Words
Philippe Desbrosses
Honorary President of the Institute Sylva

Dear Perrine, Dear Charles,

After this memorable day of true happiness! Real sharing! Announcing in many others, I want to thank you again for your generosity, your humanity and your commitment.

I have great admiration for your route, for the example you set and for the quality of the meetings that you elicit around your "work" that connects and teaches.

Maybe you do not measure the impact of your action around you ... I can tell you it makes us feel good and I want to continue to share with all friends who gathered on July 5 in your little paradise.

I also wish to thank the participant (as honorary president) that is at least one good reason for President ... for the quality of exchange and sincerity of purpose.

Thank you to pass on this message with the token of my sympathy. I kiss you hard, the whole family.

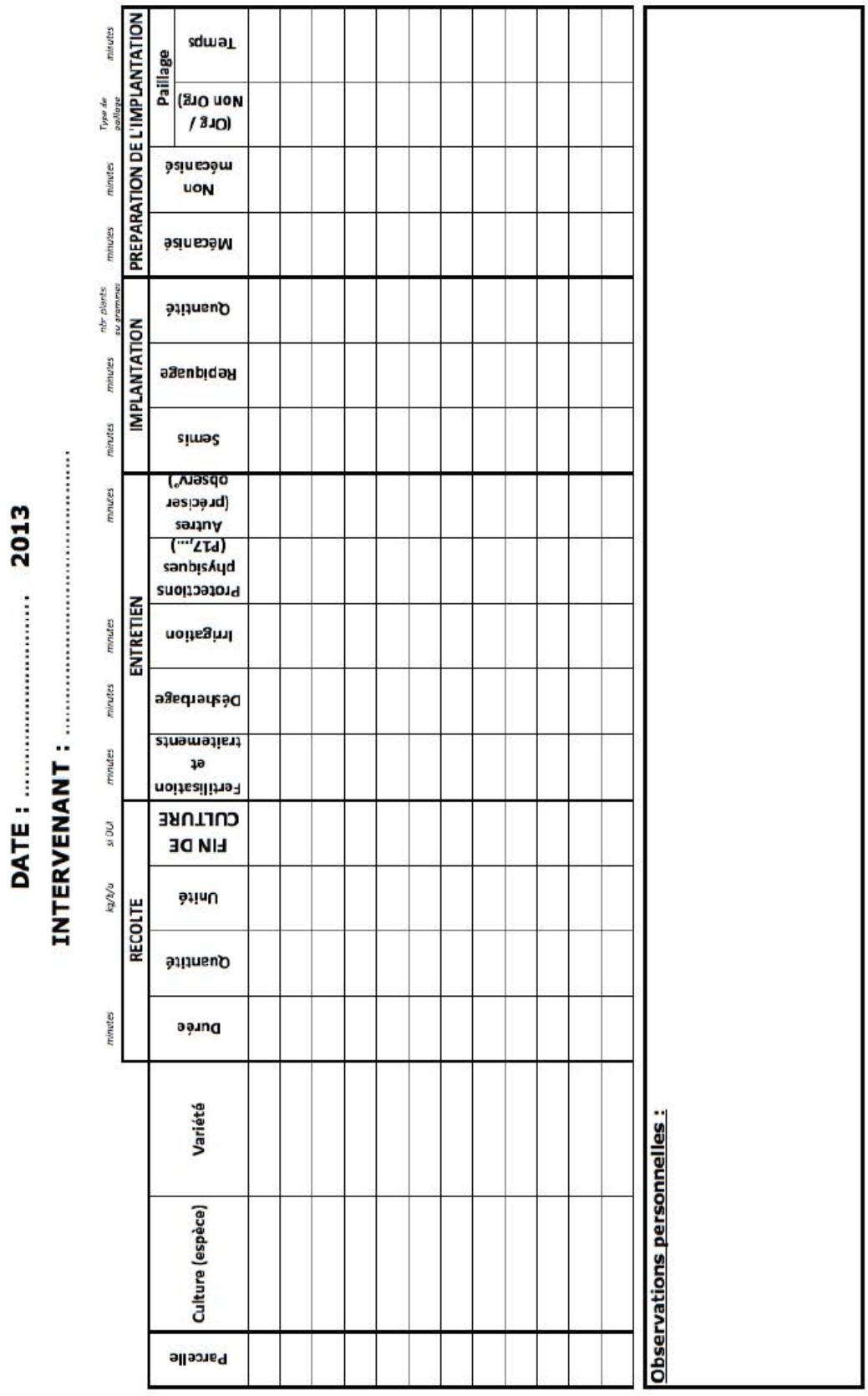
Philippe Desbrosses

Appendix: turnover generated per vegetable

	Turover generated between 1st June 2012 and 31st May 2013 (euros)	Remarks
Tomato	4011	142m² cultivated for Tomatoes (in association with other vegetables)
PAM (1)	3064	
Courgette Fruit (2)	2625	
Cut Greens	2273	
Carrot	1698	
Cabbage	1663	
Cucumber	1367	
Radish	1297	
Apple	1173	
Flowers	1149	
Lambs Lettuce	1124	
Peas	1009	65.5m² cultivated for Peas (in association with other vegetables)
Spinach	996	
Beans	956	55.6m² cultivated for beans in open field, 61.2m² in polytunnel
Aubergine	927	36.8m² cultivated for aubergines (in association with other vegetables)
Salad (4)	925	
Onion	668	
Celery	657	
Peppers	620	57.6m² peppers /chillis (in association with other vegetables)
Turnip	581	
Spring Onions	433	
Rhubarb	407	
Shallots	344	
Fennel	343	
Beetroot	330	
Broadbeans	317	15.9m² for broadbeans (in association with other vegetables)
Garlic	315	
Jurusalem Artichoke	276	
Leeks	260	
Swede	240	
Various others (5)	144	

(1) Essentially Basil.
(2) The totality of salable produce, but an important proportion was not commercially sold and finshed as compost.
(3) Mesclun, Watercress, Common Purslane, Winter Purslane, Rocket, Young Shoots, Sorrel, Asian Salads.
(4) Lettuces and Chicory. Until August, a big part of the production was put in compost, not registered and therefore not included in the study.
(5) Garden Orach, Spinach sp., Potatoes, Chards, Courgettes, Butternut Squash, Amaranth, Melon, Perilla, Garden Teas, Angelica, Parsnip Chervil, Okra, Parsnip, Red kuri Squash.

Appendix: Survey Sheet



DATE : 2013

INTERVENANT : .....

Parcelle	Culture (espèce)	Variété	RECOLTE				ENTRETIEN							IMPLANTATION			PREPARATION DE L'IMPLANTATION			
			Durée (minutes)	Quantité (kg/g/u)	Unité	FIN DE CULTURE (si OUI)	Fertilisation et traitements (minutes)	Désherbage (minutes)	Irrigation (minutes)	Protections physiques (P17,...) (minutes)	Autres (préciser observ°) (minutes)	Semis (minutes)	Repiquage (minutes)	Quantité (nbr plants ou grammes)	Mécanisé (minutes)	Non mécanisé (minutes)	Paillage (Org / Non Org) (Type de paillage)	Temps (minutes)

Observations personnelles :