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Effect of the Education of Farmers on the Quality of Soya Farming Management in North-East Benin

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ABSTRACT

Theoretically, the human capital is an important factor for a good quality of farming management. However, can that theory be implemented with the soya farmers in Benin? This paper deals with that issue in the North-East Benin which is the most important soya production area in Benin. The Trochim approach was used to identify the assessment criteria. Through a participatory approach, these criteria were adapted to North-East Benin context and balanced by farmers them selves. The quality of the management of the soya farming was collected from 288 farmers. The characteristics of the farmer and his farm were also collected. A regression model was specified and estimated through a robust estimation method correcting heteroscedasticity errors. Results indicated that soya farmers from the North-East Benin had globally a good management quality of their farming. The membership to the group of instructed farmers, without academic diplomas, trained on soya production technics (INDAFT) had positive influence on the soya farming management score. Thus, it is important to train soya farmers on technics of soya farming. In order to improve their education, farmers' training in functional literacy is also necessary. The extension services should then make farmers' training more effective in order to improve the quality of their soya farming for better yield purpose.

KEYWORDS: training, production technics, quality score, soya, Benin

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INTRODUCTION

In Africa and especially in Benin, the agriculture constitutes an important share of the economic sector due to its contribution of 36% to the Gross Domestic Production (GDP) and the share of the employed population (70%) [1]. However 36.2% of farmers are under the poverty line[2].

To face this situation in the North-East Benin, the soya became an emergent crop due to its contribution to the improvement of the farmers' income. The statistics of the last decade indicates that the average yield of the soya was about 500 kg/ha[3]. This yield is by far lower than the potential yield which is about 3t/ha[4]. There is then a problem of low yield of the soya in Benin. So, the improvement of that yield is an important challenge to meet for the development of the soyachannel in Benin.

Several factors can explain the low yield of the soya. There are the pluviometry level, the soil quality, the inputs (seed, fertilizer, pesticides, etc.) and the combination of these inputs, the equipment and materials as well as the labor[5,6,7]. The combination of inputs, equipment and materials and the labor indicates the quality of the farmingmanagement[8]. Some studies showed that the soya is a crop which requires a relatively low level of inputs (fertilizer) [9]. Thus, an improvement of the soya yield is mostly linked to a good quality of the farming management. Therefore, it is important to take this aspect into account to appreciate the soya production.

According to [10], the human capital, through the education plays a great part in the improvement of the quality of the farming management. In Benin, the quality of soya farming has not been deeply studied. There is then a lack of scientific information which can lead the set up of the technical slip of extension in order to boost the soya yield. This article aimsat contributing to fill this gap by responding to the following question: what is the influence of the education on the quality of the soya farming management?

Therefore, this research is pertinent and its results would allow to betterconduct the capacity building of the soya farmers in order to improve the quality of the management of their production cycle and then the soya yield. The following sections present respectively the methodology adopted, results and discussion and finally the conclusion.

EXPERIMENTAL SECTION

Theoretical framework

The theory of productive resources allows taking into account the different dimensions of the farming management. [11] pointed out the importance of the social capital and the economic capital in the

choices and the practices of farmers. According to [12], considering the economic side, capacities of the farmer come from the value of flowsand services obtained from the use ofthe specific assets which are under his control. These assets are about the classical capitals which contribute to the process of agricultural production (physical capitals, financial capitals and human capitals) and the resources linked to social capitals.

[13]combined the observations of [11] and [12] showing that the theory of productive resources took into account all dimensions of the farming management (physical capital, financial capital, human capital and social capital). This research pursues the same logic as [13]. It takes into account the physical capital, the human capital, the social capital and the financial capital as factors, which can affect the quality of the soya farming management.

Estimation procedure of quality of farming management

The measure of the management quality raised up serious debates in the literature[14]. With the development of technologies for research, some multi-criteria methods for decision making were performed. These methods which integrate all possible criteria seem to be more consensual [14]. To measure the quality of the farming management, [15] developed a multi-criteria method based on the calculation of the balanced sum of the values of various elements composing a set of criteria. Technico-organizational structures of the farm in general and particularly the structures which roles are to contribute to the quality of the farming management are the factors taken into account to assess the value to be given to the criteria [16].

The advantage of this multi-criteria method is that it is simple and effective, even if some researchers pointed out some limits concerning the interpretation of the importance of each criterion [17].Each criterion has a maximum value based on realities of the concerning farms [16]. The total score is calculated summing the balanced value of each criterion. That method is really pertinent because after the data collection one can notice that there is no criterion which can separately be discriminant for the explanation of the quality of farming management [16]. In the frame of this research, the following theoretical criteria were identified using Trochimapproach[18]: soil type, plough depth, sowing on line, number of grains per seed hole, distance between seed hole, distance between lines, quantity of seed per ha, utilization of organic fertilizer, dose of inoculum per ha, number of weeding, herbicide using, dose of herbicide per ha, tools used for the harvesting, technic of harvesting, number of times of harvesting,

yield, threshing mode, place of seed conservation before sowing andplace of soya grains conservation after threshing [18].

Table No. 1: "System of score of the quality of soya farming management in North-East Benin"

Components	Criteria	Modalities	Applicable score
Soil preparation	Utilization of herbicide for clearing	Yes No/Manual clearing	8.25 5.50
	Plough type	Flat plough Ridge	6.50 3.75
	Soil type	Highly adapted Fairly adapted	6.00 3.75
	Plough depth	15 to 20 cm other	5.25 1.75
	Possible maximum score for the component		26.00
Sowing	Place of seed conservation	Out of range of humidity Within range of humidity	11.00 2.25
	Sowing on line	Yes No	8.75 2.25
	Number of grains per seed hole	2 to 3 Other	8.25 2.25
	Distance between seed hole	20 to 30 cm Other	10.00 2.25
	Distance between lines	40 to 50 cm Other	9.50 2.25
	Possible maximum score for the component		47.50
Fertilization	Utilization of organic fertilizer	Yes No	3.00 1.00
	Dose of in oculum per ha	3 sachets /ha Other	4.00 1.00
	Possible maximum score for the component		7.00
Up keeping	Number of weeding	1 to 2 Other	3.00 1.50
	Utilization of herbicide for up keeping	No Yes	6.75 2.25
	Possible maximum score for the component		9.75
Harvesting	Tools used for harvesting	Hand Hoe	1.00 0.75
	Harvesting technics	Breaking of the stalk Uprooting	1.75 0.25
	Possible maximum score for the component		2.75
Post-Harvest	Threshing mode	Manual Mechanical	3.25 1.50
	Place of grains' conservation	Out of range of humidity Within range of humidity	3.75 0.75
	Possible maximum score for the component		7.00
Maximum global score			100.00

Taking inspiration from the studies of [19,20], a preliminary phase was conducted for the adaptation and the balance of the criteria. These criteria were participatorily adapted and balanced according to

Benin realities. In fact, these criteria were submitted to farmers at the time of focus group discussions in the two departments of the North-East Benin following four steps. First, farmers identified important criteria adapted to conditions of their area.

Second, retained criteria were gathered in almost homogenous components. Third, the importance of each modality of each criterion was assessed following a scale of 5 grades. Finally, components were ranked according to their importance in order to determine a coefficient for each component. This phase allows setting up a system of score presented in Table No. 1. The maximum total score was 100. The component "sowing" had the highest possible maximum score (47.5) and the component "harvesting had the lowest possible maximum score (2.75).

Study area, sampling and data collection

The districts of Banikoara, Kandi, Nikki and N'Dali located between 9° and 12° North and 2° and 4° East in the North-East Benin were selected for this research. Nikki and N'Dali belong to the third ecological zone of Benin. This zone is the food-producing zone and likewise, is the most important soya production zone in Benin since five years. Banikoara and Kandi are municipalities where the cotton is the most important crop[3]. However, soya production is increasing in these municipalities. In each municipality, two villages were selected based on their soya production during the last five years, their accessibility and their geographic position relative to the center of the municipality (**Figure No. 1**). The observation unit of this research was the soya farm. In each selected village, the soya farmers' sampling started by their census. Afterward, 36 soya farmers were randomly selected using the random function of Microsoft excel. Thus a total of 288 farmers were selected in the eight villages.

Data were collected from soya farmers using an individual questionnaire. These data were about the quality of soya farming management through the criteria in Table No 1 and the socio-economic and demographic characteristics of the farmers. In addition, the data on constraints such as the lack of credit for farmers, the insufficiency of labor and help from other farmers were collected.

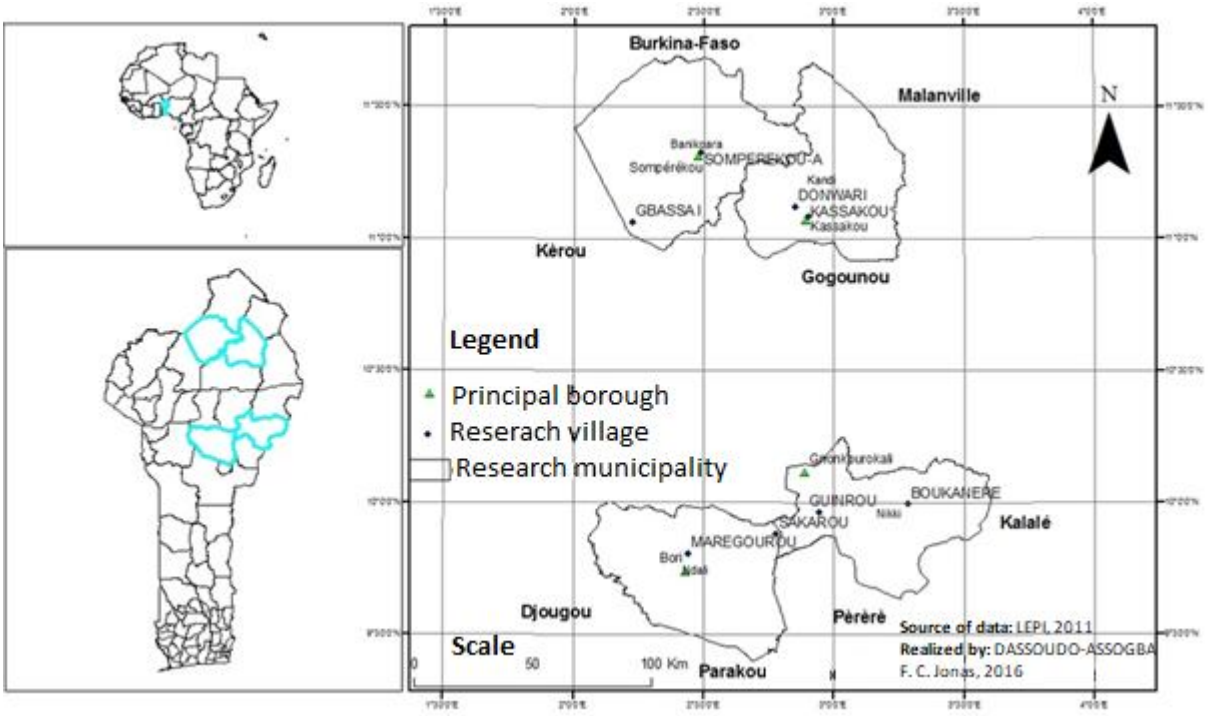

Figure No. 2: "Map of the study area"

Modeling the effect of education on the qualityof soya farming management

Based on the theoretical approach used in this study, it appears that the quality of soya farming management is function of the physical capital, financial capital, human capital and social capital[11, 12, 13, 21,22, 23,24,25].Thus, we have:

$$SQFM_i = F(PC_i, FC_i, HC_i, SC_i) \quad (1)$$

where $SQFM_i$ is the score of the quality of soya farming management of the farmer$i$,$PC_i$is the physical capital of the farmer i,FC_i is the financial capital of the farmer i,HC_i is the human capital of the farmer i andSC_i is the Social capital of the farmer i.

The land is the most important physical capital in agriculture[21]. Thus, the cultivated area for soya and the cultivated area for other crops are potential factors determining the quality of soya farming management [26]. The access to loan is an indicator of financial capital which can determine the quality of farming management [27]. The formal and the non-formal education and the practice experience are some aspects of human capitalwhich can affect the farming management quality [28,29]. The farmer'sage can also affect the quality of his farming management [30,31,32,33,34,35,36].

According to [29,37,38,39], the quality of farming management, also depends on the labor that farmers can as well have helping each other. One can then rewrite the equation (1)as follow:

$$SQFM_i = \gamma_0 + \gamma_1 \mathrm{AGE}_i + \gamma_2 \mathrm{EXPS}_i + \gamma_3 \mathrm{AROC}_i + \gamma_4 \mathrm{GROUP}_i + \gamma_5 \mathrm{LAC}_i + \gamma_6 \mathrm{CIHP}_i + \gamma_7 \mathrm{CL}_i + \gamma_8 \mathrm{EDU}_{ij} + \gamma_9 SAREA_i + \gamma_{10} CONEXT_i + \in_i \quad (2)$$

where γ are parameters to be estimated,AGE_i is the age of the farmer$i$,EXPS_i is the experience of the farmer$i$ in soya production,AROC_i is the area of other crops cultivated by the farmer$i$,GROUP_i is the membership of the farmer$i$ to a farmers' association,LAC_i is the lack of agricultural credit as constraint for the farmer$i$,CIHP_i is the insufficiency of help between the farmers as constraint for the farmer$i$,CL_i is the constraint of access to labor for the farmer$i$,EDU_{ij} is the education$j$ of the farmer$i$,$SAREA_i$ is the soya cultivated area of the farmer$i$,$CONEXT_i$ is the contact with the extension services by the farmer i and$\in_i$ is the error terms.

Following the theoretical approach of [40], education of an individual depends onhis own characteristics and those of his parents or tutors. Thus, considering the education in the frame of this research as the principal component of the human capital, we have:

$$EDU_{ij} = F(CF_i, CP_i) \quad (3)$$

where EDU_{ij} is the education group j (combination of the different dimensions of the education as quoted above) which the soya farmer i belongs to,CF_i is the set of characteristics of the farmer i,CP_i is the set of characteristics of the parents or tutors of the farmer i and his environment.

According to [41], EDU_{ij} corresponds to three groups of soya farmers in the study area: DANFT, NINFT and INDAFT. DANFT includes farmers with academic diploma but without any training on soya farming. NINFT includes farmers without neither formal education nor training on soya farming. INDAFT includes instructed farmers who do not hold any academic diploma but were trained on soya farming technics.

Each of these groups was mathematically defined as follow:

$$DANFT = \alpha_0 + \alpha_1 SEXPARENT + \alpha_2 NIPPARENT + \alpha_3 NISPARENT + \alpha_4 FARM + \alpha_5 SEXFARM + \alpha_6 BANIKOARA + \alpha_7 KANDI + \alpha_8 NDALI + \alpha_9 BARIBA + \alpha_{10} MUSLIM + \alpha_{11} CONEXT + \alpha_{12} LYIELDC + \alpha_{13} LMTITC + \alpha_{14} CHC + \alpha_{15} SAREA + e_i \quad (4)$$

$$INDAFT = \beta_0 + \beta_1 SEXPARENT + \beta_2 NIPPARENT + \beta_3 NISPARENT + \beta_4 FARM + \beta_5 SEXFARM + \beta_6 BANIKOARA + \beta_7 KANDI + \beta_8 NDALI + \beta_9 BARIBA + \beta_{10} MUSLIM + \beta_{11} CONEXT + \beta_{12} LYIELDC + \beta_{13} LMTITC + \beta_{14} CHC + \beta_{15} SAREA + \epsilon_i \quad (5)$$

$$NINFT = \delta_0 + \delta_1 SEXPARENT + \delta_2 NIPPARENT + \delta_3 NISPARENT + \delta_4 FARM + \delta_5 SEXFARM + \delta_6 BANIKOARA + \delta_7 KANDI + \delta_8 NDALI + \delta_9 BARIBA + \delta_{10} MUSLIM + \delta_{11} CONEXT + \delta_{12} LYIELDC + \delta_{13} LMTITC + \delta_{14} CHC + \delta_{15} SAREA + \varepsilon_i \quad (6)$$

where $SEXPARENT$ is the gender of the farmer's principal parent or tutor,$NIPPARENT$ is the primary school level of the farmer's principal parent or tutor,$NISPARENT$ is the secondary school level of the farmer's principal parent or tutor,$FARM$ is the agriculture as main activity of the farmer's principal parent or tutor,$SEXFARM$ is the farmer's gender,$BANIKOARA$ is the residence of the farmer in Banikoara municipality,$KANDI$ is the residence of the farmer in Kandi municipality,$NDALI$ is the residence of the farmer in NDali municipality,$BARIBA$ is Bariba ethnic (of the farmer), $MUSLIM$ is the farmer's practice of Islam as religion, $CONEXT$ is the contact of the farmer with extension services, $LYIELDC$ is low yield as constraint for the farmer, $LMTITC$ is the lack of master of the technical itinerary constraint for the farmer, CHC is the climate hazard as constraint for the farmer and $SAREA$ is the soya cultivated area.

$SQFM_i$is a score varying from 0 to 100. Thus it is defined on a segment of real numbers. To widen this definition domain and allow using of the Ordinary Least Square method, the logarithmic function was applied to $SQFM_i$ and the metric explanatory variables [42]. Furthermore there is a problem of endogeneity in the equation (2)as shown about $EDU_{ij}$by equations $(4-6)$[41]. To correct this problem, the double stage estimation method was used [42]with$DANFT$and$INDAFT$ as instrumental variables. In other words, $DANFT$ and $INDAFT$were firstly estimated following equations(4)and (5)[41]. Finally their estimated values were used to estimate the global equation (2) which becomes:

$$nl(SQFM_i) = \gamma_0 + \gamma_1 nl(AGE_i) + \gamma_2 nl(\mathrm{EXPS}_i) + \gamma_3 \mathrm{AROC}_i + \gamma_4 \mathrm{GROUP}_i + \gamma_5 \mathrm{LAC}_i + \gamma_6 \mathrm{CIHP}_i + \gamma_7 \mathrm{CL}_i + \gamma_8 \widehat{DANFT}_i + \gamma_9 \widehat{INDAFT}_i + \in_i \quad (7)$$

where$nl$is the Naperian logarithm function, $\widehat{DANFT_i}$ is the set of the estimated values of $DANFT_i$ and $\widehat{INDAFT_i}$ is the set of the estimated values of $INDAFT_i$.

Equation(7) was estimated through a robust specification correcting eventual heteroskedasticities [42] using STATA13 software.

RESULTS AND DISCUSSION

Quality of soya farming management

The results of the t test of Student indicated that the score of the quality of soya farming management varied statistically with the department (t significant at 1%). The average score of both Borgou and Alibori was about 66/100 (Figure No. 2). Soya farmers in Borgou had a relatively better quality of soya farming management with a score of about 68/100. In addition, the highest scores were obtained by farmers from Borgou. Thus, farmers from Borgou which is the greatest soya production department in Benin had a good quality of soya farming. The score of each department is higher than the half of the possible peak (50). It clearly appears then, that the soya farmer in North-East Benin had a relative good quality of soya farming management (Figure No. 2). However, there are two farmers from Borgou and onefrom Alibori whose scores were lower than 50/100.

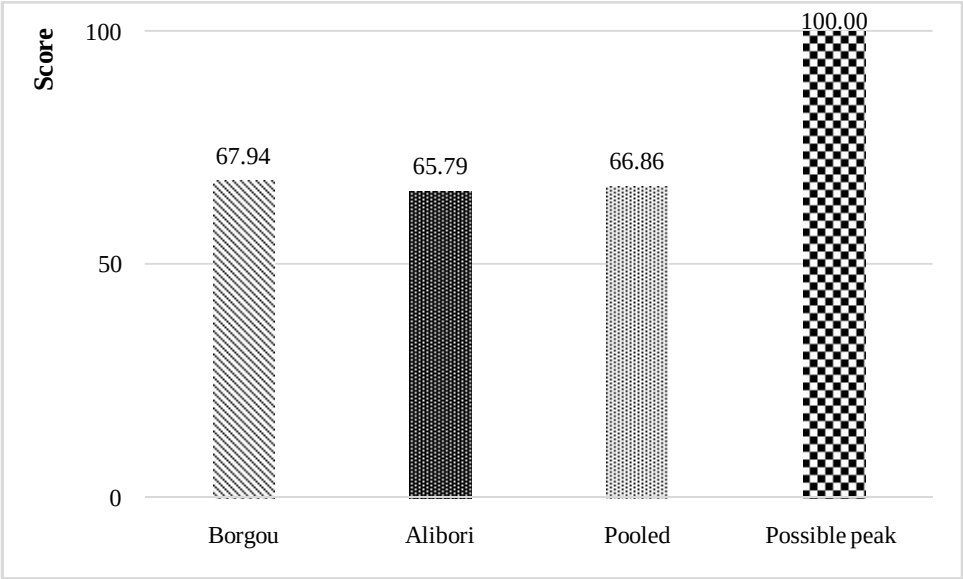

Figure No. 3: "Scores of the quality of soya farming management in North-East Benin"

Component "Soil preparation"

Concerning this component, farmers from Alibori had an average score slightly higher than those from Borgou (Figure No. 3). In average, farmers from Borgou respected more the required plough depth than those from Borgou (Figure No. 4). Likewise, they used more herbicide for the clearing of their soya plots than those form Borgou (Figure No. 4). However, farmers from Borgou respected better the required plough type and had soils better adapted to soya farming (Figure No. 4). Globally, soya farmers had good performance concerning that component. The average score for both departments was more than 80% of the possible peak (Figure No. 3).

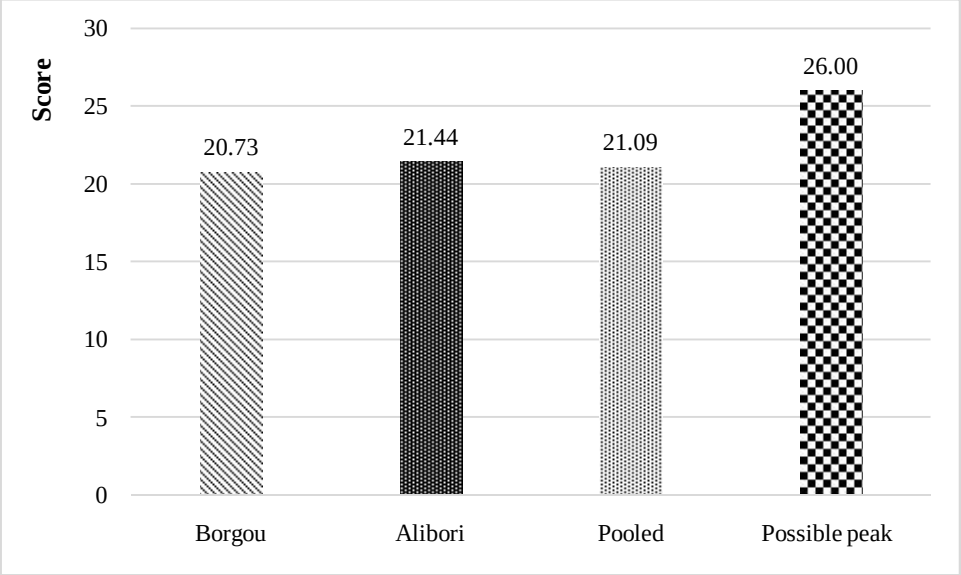

Figure No. 4: "Scores of the component soil preparation"

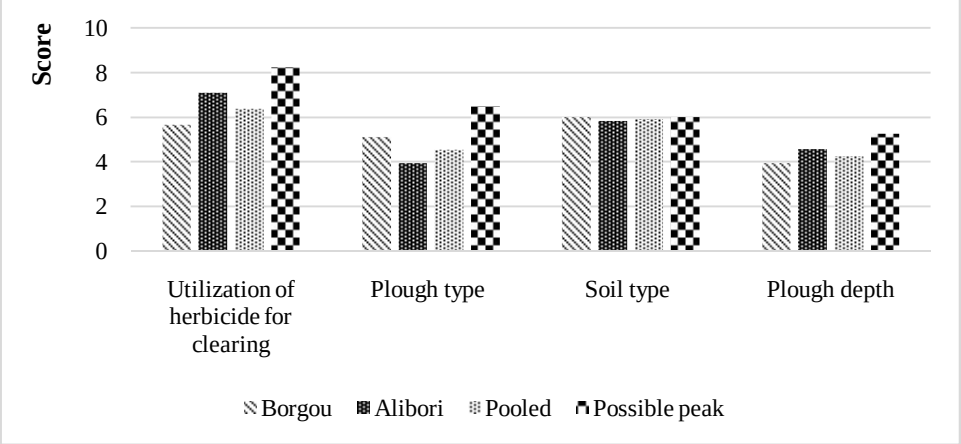

Figure No. 5: "Scores of the indicators of the component soil preparation"

Component "Sowing"

The average score in North-East Benin concerning the component “Sowing” was almost 32 for a possible peak of 47.5 (Figure No. 5). Farmers from Borgou were more respectful of requirements about this component. In average, they performed better than farmers from Alibori concerning the good conservation of the seed and sowing on line (Figure No. 6). Besides, their standing was slightly higher comparing to farmers from Alibori in the respect of the number of grains per seed hole and the distance between seed holes (Figure No. 6). The average score of studied farmers for this component is the highest following the component ‘’Soil preparation’’ (Figures No. 3 and 5).

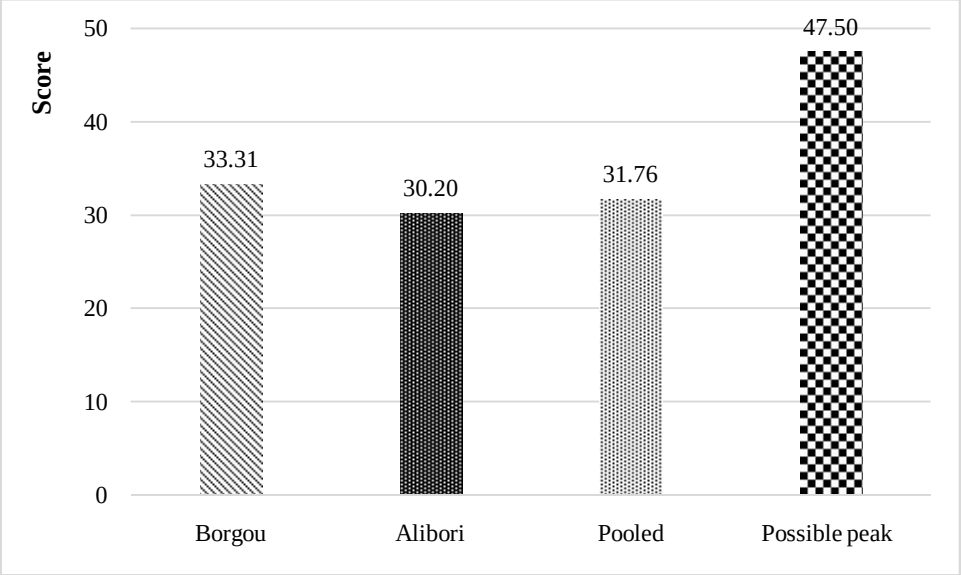

Figure No. 6: "Scores of the component Sowing"

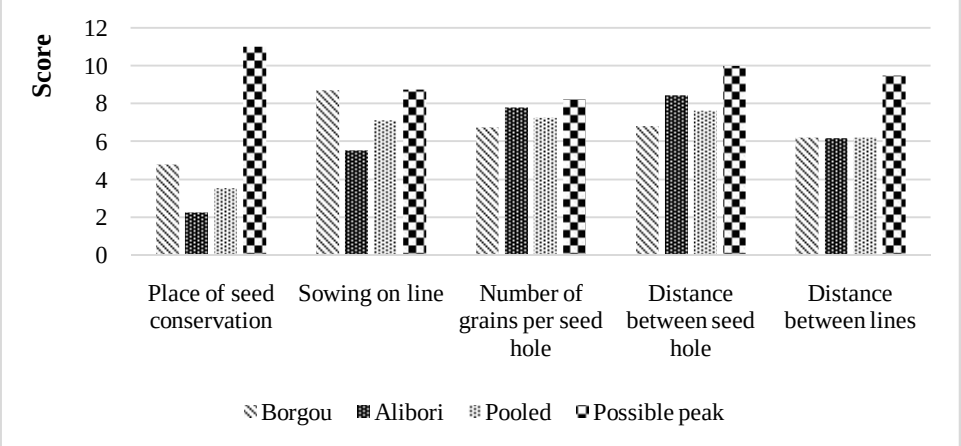

Figure No. 7: "Scores of the indicators of the component sowing"

Component "Fertilization"

In terms of ratio between the realized score and the possible peak, the soya farmers in North-East Benin got the worse score for the component fertilization. The average score was less than the third of the possible peak (Figure No. 7). Borgou had all the same, better score than Alibori (Figure No. 7). In average, Borgou farmers' performances were slightly higher than those of the farmers from Alibori concerning both indicators of this component (Figure No. 8).

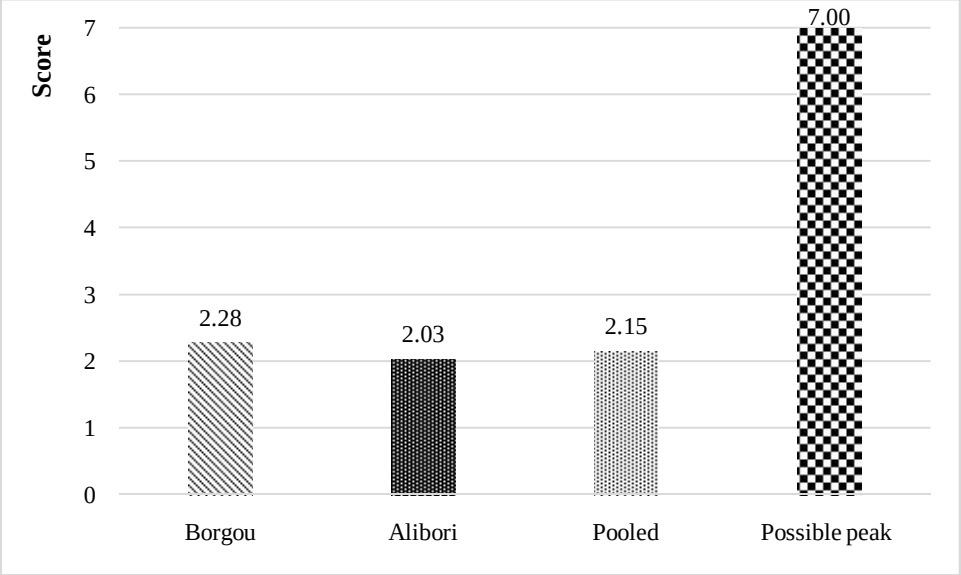

Figure No. 8: "Scores of the component fertilization"

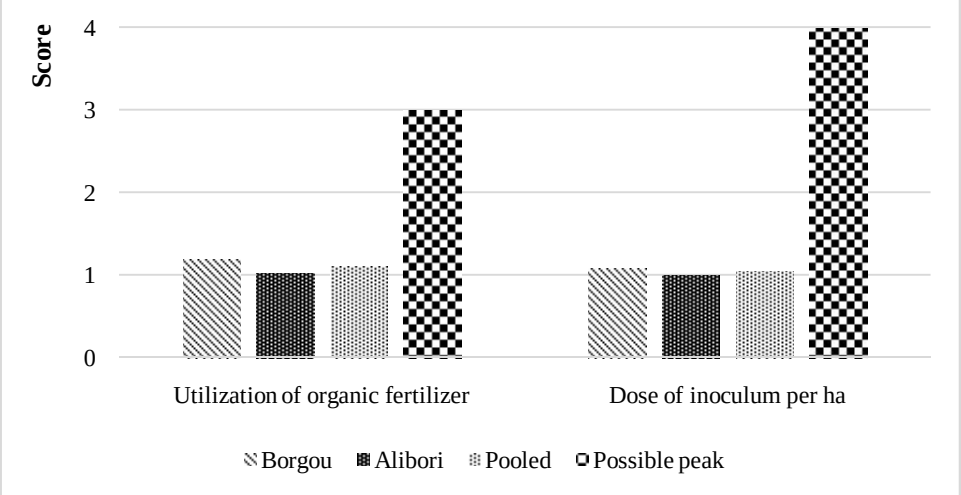

Figure No. 9: "Scores of the indicators of the component fertilization"

Component Upkeeping"

The average performance of farmers in the up keeping of their soya plots were over the half of the possible peak (Figure No. 9). The farmers from Borgou were slightly better than those form Alibori. This trend was the same concerning the utilization of herbicide for the up keeping.In contrast, farmers from Alibori were slightly better than those from Borgou for the weeding (Figure No. 10). This trend is normal since we noticed from the field that those who used herbicide for the upkeeping decrease the number of weeding and some times do not weed at all.

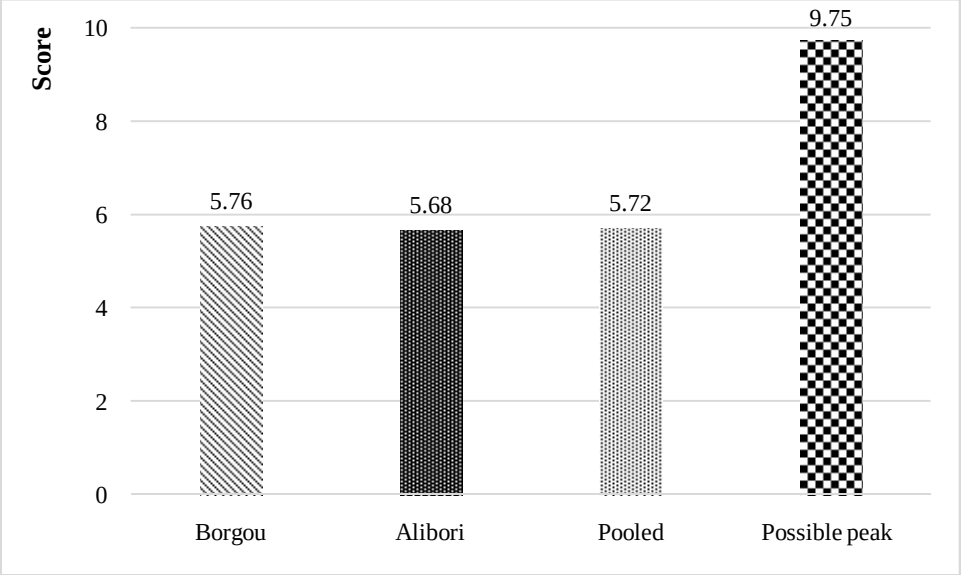

Figure No. 10: "Scores of the component upkeeping"

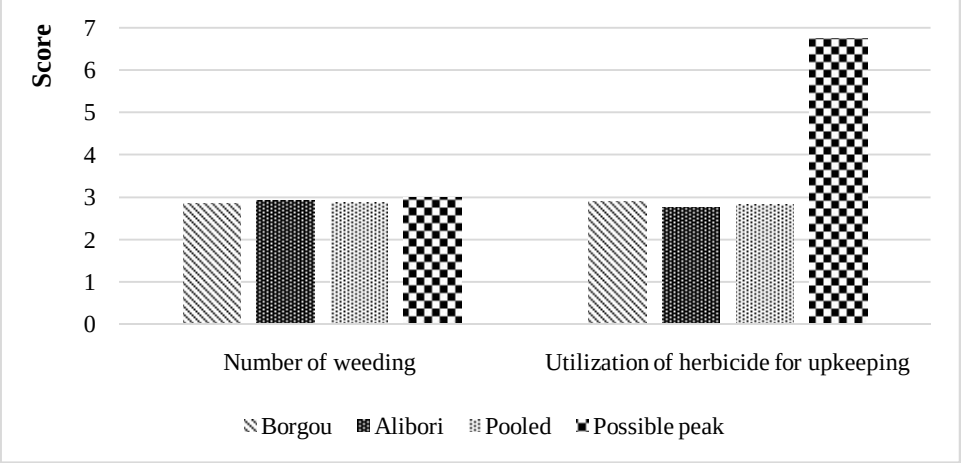

Figure No. 11: "Scores of the indicators of the component upkeeping"

Component "Harvesting"

In average, the soya farmer from the North-East Benin scored about 1.81 / 2.75 for the soya harvesting (Figure No. 11). Farmers from Alibori had a score very close to the possible peak. This great score is mostly due to their good technics of soya harvesting (Figure No. 12). They generally broke the soya stalk, leaving the roots spoiled in the soil to better conserveits fertility. Contrary to them, farmers from Borgou are better concerning the used tools. They used in majority their hand for the harvesting (Figure No. 10).

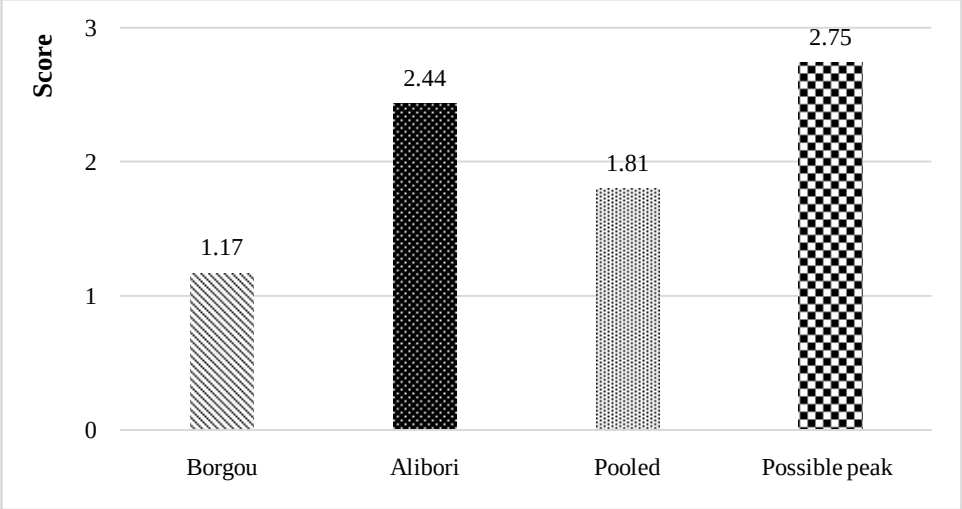

Figure No. 12: "Scores of the component harvesting"

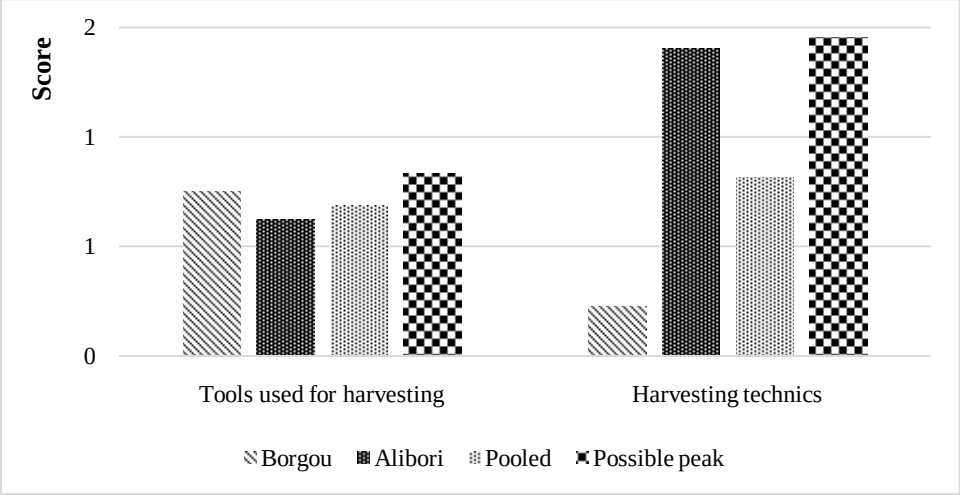

Figure No. 13: "Scores of the indicators of the component harvesting"

Component "Post-Harvest"

The post-harvest activities related to the soya farming can be sum up at the threshing mode and the place of the grains conservation. Broadly, North-East farmers had good score for the component post-harvest, with the Borgou at the top (Figure No. 13). Concerning the threshing mode, all surveyed farmers did the threshing by hand (manual threshing) which is for the moment, the best threshing mode. In fact this mode allows preserving the integrity of grains and avoiding their scattering which can cause enormous quantity losses. All surveyed farmers reached the possible peak concerning the threshing mode. (Figure No. 14). However, the majority of the farmers did not conserve their soya grains out of range of the humidity. Accordingly, they had bad scores for the indicator place of grains conservation, with however, the Borgou at the top (Figure No. 14).

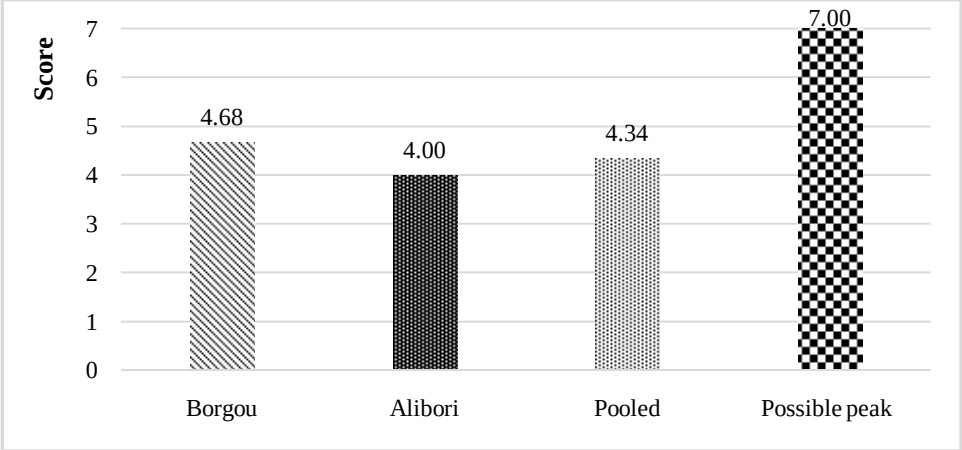

Figure No. 14: "Scores of the component post-harvest"

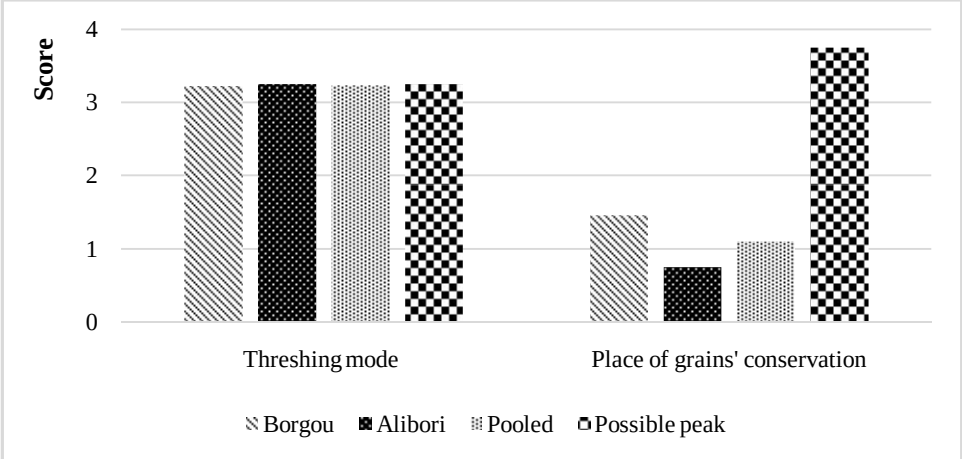

Figure No. 15: "Scores of the indicators of the component post-harvest"

Effect of the farmer education on his quality of soya farming management

The model was globally significant at the threshold of 1% (Table No. 2). The explanatory power of the model was over 19% (Table No. 2). Thus more than 19% of variations of the score of the quality of the soya farming management in North East-Benin are explained by variations of the explanatory variables in the model. Factors significantly determining the level of the quality of soya farming management in the North-East Benin are the cultivated area for other crops, the lack of credit for farmers, the lack of help between farmers and the membership to the group of instructed farmers, without academic diplomas but trained on the soya farming technics (INDAFT) (Table No. 2).

When the probability for the farmer to belong to the group of instructed farmers, without academic diplomas, trained on soya farming (INDAFT) increases, his level of quality of the soya farming management is improved (Table No. 2). Thus, farmers who have been trained on soya farming technics had better quality of its farming management. The belonging of the farmer to the group of holder of academic diplomas, without training on soya farming (DANFT) does not have significant effect on his quality of soya farming management (Table No. 2). Accordingly, the academic diplomas do not have significant effect on quality of farming management. It is rather the informal education related to soya farming technics combined with the instruction (without academic diplomas) which influence positively the quality of its farming management. This result is consistent with [43]who demonstrates that in China, training of the farmer on farming technics positively influence the quality of his farming management. For this author, managerial decisions are influenced by the education and training received and then the quality of the farming management. It is also consistent with [43]who shows that the instruction of the farmer presents significant effect on the quality of his farming management.

When the cultivated area for the other crops increases of 1%, the score of quality of soya farming management decreases of 0.01% (Table No. 2). This result can be explained by the fact that when the farmer cultivates great area for other crops, he does not have a lot time for soya plots. Thus the quality of his soya farming management decreases. This result is consistent with [26] who showed that the extension of cultivated area presents evident negative consequences on the quality of farming management. This author demonstrated that when a farmer cultivates very large area, his capacity to manage the farming decreases and can affect negatively the quality of the farming management.

When the farmer feels the constraint of access to agricultural credits, his quality of soya farming management is improved (Table No. 2). In fact, the soya is considered as an industrial crop. Its

production generates important incomes for its farmers. Thus when farmers are in lack of credit, they better focus on soya farming, improve their quality of its farming management, expecting a good yield and then a good income to ensure their daily expenses and the investment in the farming. For [27], the financial capital is an important element which can influence the quality of farming management. For this author, when the farmer need floats because of lack of credit, the industrial crops such as cotton, cashew and soya represent some assets. The income from these crops can help paying the labor, providing suitable equipment and consumption expenses of the family.

When the insufficiency of help between farmers constitutes a constraint for the farmer, his score of quality of soya farming management decreases significantly. Thus, a better global quality of soya needssolidarity between farmers for the sharing of important information and knowledges. In addition, the farmer based on his social relationships can develop mutual aid which is a potential source of labor. This capacity of the farmer to face difficult conditions and allocates the labor resources among different activities positively influences his quality of farming management [37, 38].

Tableau No. 2: "Effet de l'éducation des producteurs sur leur qualité de gestion de la production de soja au Nord-Est du Bénin "

Explanatory variables	**Statistics [a]**	**Model**	
		Coefficient	**Standard error**
Age of the farmer (years)[nl]	3.572 (0.372)	0.015 (0.65)	0.023
Number of years of experience in soya farming (years)[nl]	1.311 (0.638)	0.004 (0.31)	0.012
Cultivated area for other crops (ha)[nl]	1.197 (1.052)	-0.014 (-2.13)**	0.007
Membership to a farmers' association (1 =yes, 0= no)	51.736%	0.007 (0.48)	0.014
Constraint of lack of agricultural credit (1 =yes, 0= no)	92.361%	0.055 (1.92)*	0.029
Constraint of insufficiency of help between farmers (1 =yes, 0= no)	81.597%	-0.065 (-2.96)***	0.022
Constraint of lack of labor (1 =yes, 0= no)	87.152%	-0.029 (-1.07)	0.028
Probability for the farmer to belong to the group of farmers holding academic diplomas, without training on soya farming (DANFT) (%)	17.544%	-0.007 (-0.16)	0.041
Probability for the farmer to belong to the group of instructed farmers, without academic diplomas, trained on soya farming (INDAFT) (%)	15.789%	0.130 (3.37)***	0.039
Constant	_	4.155 (48.06)	0.086
Number of observations		269	
F (dif1= 9, dif2= 259)		7.06***	
R^2		19.24%	

a : mean (standard deviation) for quantitative variables and percentage for the qualitative variables and probabilities

nl : Naperian logarithm transformation

Results showed that when the number or years of experience in soya farming increase, the score of the quality of soya farming management increases too, although this increasing was not significant. According to [29], a year of experience increases farms' profit for about 1% through the improvement of the quality of the farming management.

Results also showed that the age of the farmer increases his quality score of soya farming management even though this increasing is not significant. A lot of studies corroborate these results showing that the socio-economic characteristics of farmers such as his age affect his level of quality of his farming management [30,31,32,33,34,35,36].

CONCLUSION

This article aims at pointing out the effect of the education on the quality of soya farming management in North-East Benin. Results indicate that globally, soya farmers in North-East Benin have good enough quality of soya farming management (66/100).Farmers from Borgou department, viewed generally, manage better their soya farming than those from Alibori.

The education has a significant effect on the quality of soya farming management in that area of Benin. The group of instructed farmers, without academic diploma and trained on soya farming technics (INDAFT) has a better quality of soya farming management. So, trainings on soya farming technics improve the quality of its farming management. Then, when farmers will be suitably trained on soya farming technics, they will apply better the technical itineraries, better take the environment and the durability of soya production into account.

It is the nobvious that more emphasis should be puton farmers' training. In that respect, Benin extension services should put more interest on soya. Soya being a crop with triple importance (income generation, nutritional security, rational management of soil fertility), the good quality of its farming management will allow this crop to really play its parts. However, there is still an interrogation mark: does the good quality of soya farming management allow an efficiency of its production?

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