

 <p>ISSN NO. 2320-5407</p>	<p>Journal Homepage: - <a href="http://www.journalijar.com">www.journalijar.com</a></p> <h2>INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)</h2> <p>Article DOI: 10.21474/IJAR01/5740 DOI URL: <a href="http://dx.doi.org/10.21474/IJAR01/5740">http://dx.doi.org/10.21474/IJAR01/5740</a></p>	
---	--	---

### RESEARCH ARTICLE

#### PESTICIDES USES IN CERTAIN PEANUT GROWING AREAS IN SENEGAL.

Aizan Maggie-Angéla Rosalina Gbéhodé<sup>1,2</sup> and SEMBENE Mbacké<sup>1,2</sup>.

1. Department of Animal Biology, Faculty of Science and Technics, C.A. Diop University, Dakar Fann-PO 5005, Senegal.
2. BIOPASS, UMR 022 IRD-CBGP, Dakar Bel-Air PO 1386, Senegal.

#### Manuscript Info

##### Manuscript History

Received: 01 September 2017  
Final Accepted: 03 October 2017  
Published: November 2017

##### Key words:-

Carbamates, peanut, pests, pesticides,

#### Abstract

In order to protect their crops from pests attack, producers resort to pesticides use, yet poor control of this practice may have negative consequences on their own person, on environment and cause emergence of resistance in the target organisms.

The objective of this study is to identify the various pesticides used in peanut growing areas and to know their use. It is based on surveys conducted in 4 areas. 84% of producers use these products. They are mainly found in powder or pellets form and carbamates family are mostly used. However, the lack of training and information for producers is a real problem in the different areas.

Copy Right, IJAR, 2017,. All rights reserved.

#### Introduction:-

Senegal economy is dominated by agriculture. It represents about 20% of GDP (Gross Domestic Product) for a nominal GDP estimated at 4000 billion FCFA (DPS, 2003). The agricultural sector occupies 60% of the population and farmers, to increase and protect productions use phytosanitary products known as pesticides.

Senegalese farming uses on average 598 tons of solid pesticides and 1.336.560 liters of liquid pesticides per year (Pan, 2006) for a value of nearly 10,500,000,000 CFA francs. Organochlorines are the most used pesticide family (about 3000 liters per year). These pesticides are intended for treatment of crops, stored food, public health and animal health. However, the latter too expensive cause huge environmental and public health problems. This is compounded by the appearance of resistance in the various crop pests due to the abusive and unreasonable use of these products. To deal with these different problems a knowledge of the different chemicals and their use is necessary. Data on pesticides use in peanut industry are almost nonexistent. It is in this context that fits this study aimed to identify different pesticides used in peanut growing areas and know their use.

#### Methods:-

The study is based on field surveys conducted with producers of peanuts. They are made on the basis of questionnaires submitted to random farmers and distributed as follows: 14 in Saint-Louis area, 20 on the Mbour-Fatick axis, 35 in Niore and 13 in Sedhiou.

The investigation focuses on practices related to the use of pesticides in peanut producing areas with issues such as the pesticide type used in the different areas, their formulations, their families, their frequency of use, respect or not planned doses, the management of the packaging, the precautions taken after their use.

**Corresponding Author:- AIZAN Maggie-Angéla Rosalina Gbéhodé.**

Address:- Department of Animal Biology, Faculty of Science and Technics, C.A. Diop University, Dakar Fann-PO 5005, Senegal.

The data collected were analyzed and processed in Excel and pesticides families were determined in relation to the product names given by farmers.

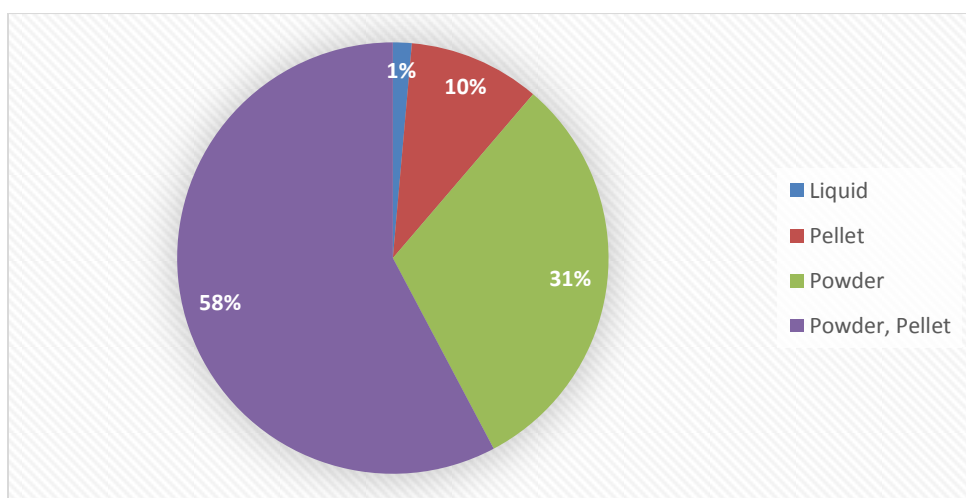
## Results:-

### Pesticides uses:-

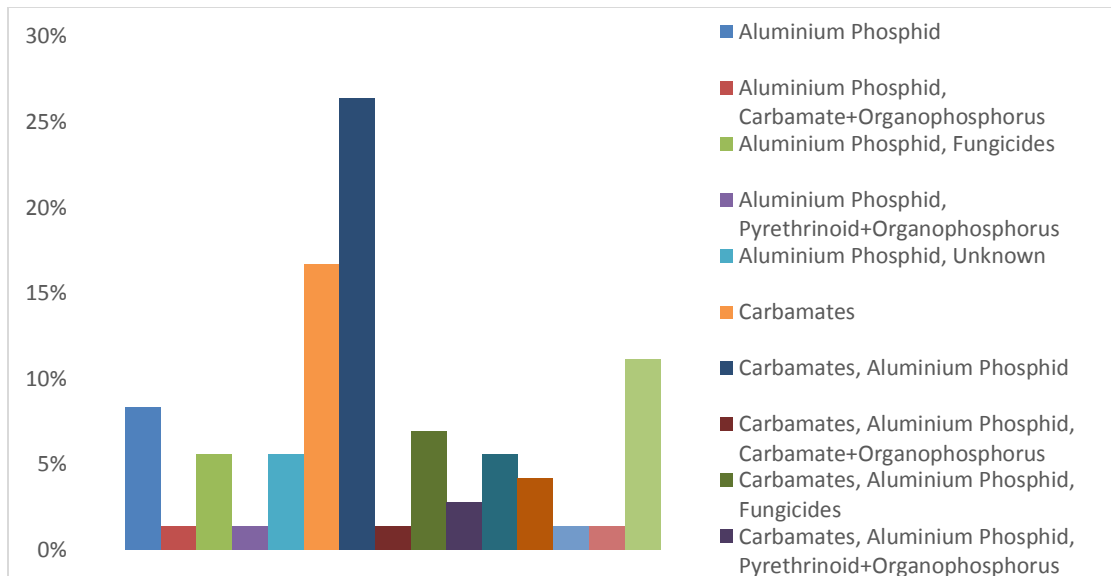
Producers discussed in different areas across 84% use pesticides products to protect of their crops, they are mainly found in powder form and pellets (58%) which they call effective. Carbamates are more frequent, they are used alone (17%) or in combination with Aluminium Phosphide (26%). Formulations composed of a mixture of Carbamate and Organophosphorus, Pyrethrinoid and Organophosphorus are also encountered. This is the case of "Saxal" and "Poudre Traoré" (Table 1). However, some producers claim that they have not always used the same products. Indeed, their choice is linked to the effectiveness of the product, to that which is available on the market or to the financial means. It should also be noted that a number of producers (11%) use unknown products whose names are unknown and whose packaging was not found locally at the time of the survey.

**Table 1:-** Pesticides used by peanut producers in study areas

TRADE NAME	Formulation	ACTIVE INGREDIENT	Family
Bomec	Powder	Abamectin	Avermectin
Dadyonum	Pellet	Aluminium Phosphide 70%	
Diasphox	Pellet	Aluminium Phosphide + Inert substances	Inorganic Phosphorus
Fanytra	Powder	Cypermethrin	Pyrethrinoid
Granox	Powder	Imidacloprid + Thiram + Carbosine	
Phostoxin	Pellet	Aluminium Phosphide	
Poudre Traoré	Powder	Fenitrothion 2% + Cypermethrin1%	Organophosphorus + Pyrethrinoid
Saxal	Powder	Thiram + Chlorpyrifos	Carbamate + Organophosphorus
Souye Balé	Powder	Cypermethrin	Pyrethrinoid
SUMITHION	Powder	Fenitrothion	Organophosphorus



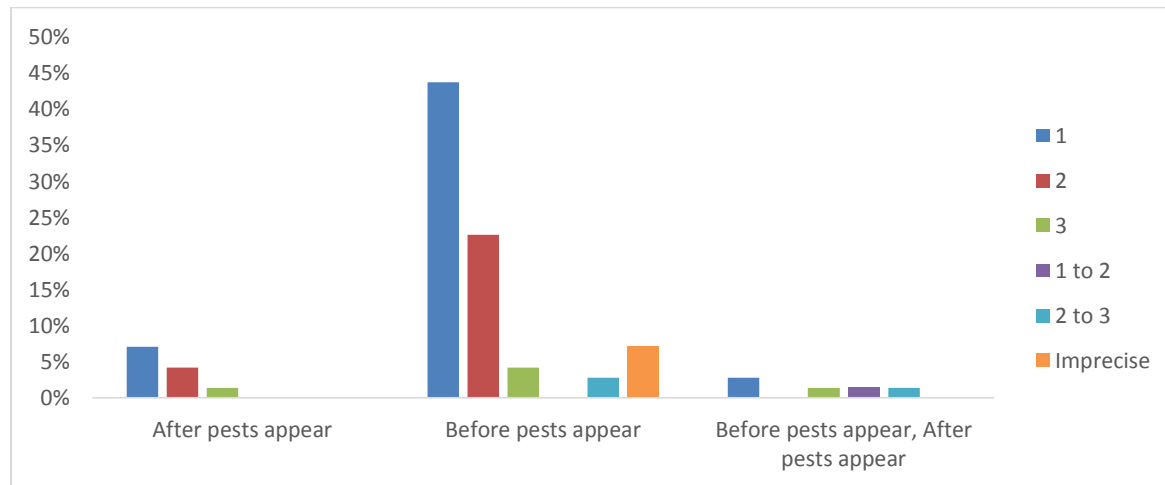
**Graph 1:-** Producers distribution according to the pesticide formulation



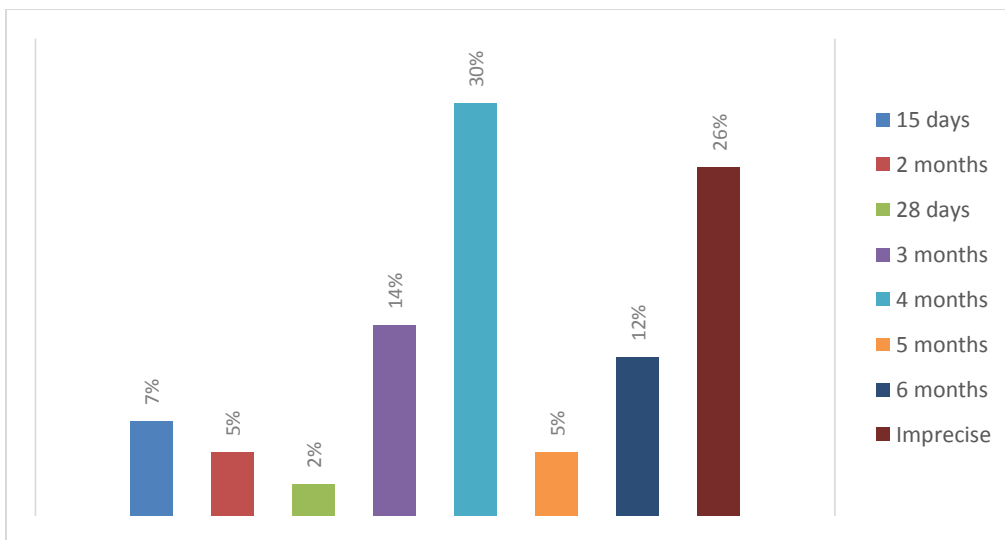
Graph 2:- Producers distributions according to pesticides family

**Treatment moment and Frequency:-**

The moment of pesticides application, the number of treatments and the frequency between treatments vary from one producer to another. 78% of the people surveyed treat their crops before pests appear, and the majority (54%) made a single treatment. For the others, the interval varies from 15 days (7%) to 6 months (12%); however, many of them (30% of producers) respect a period of 4 months between their applications.



Graph 3:- Producers distributions according to the moment and the number of treatment

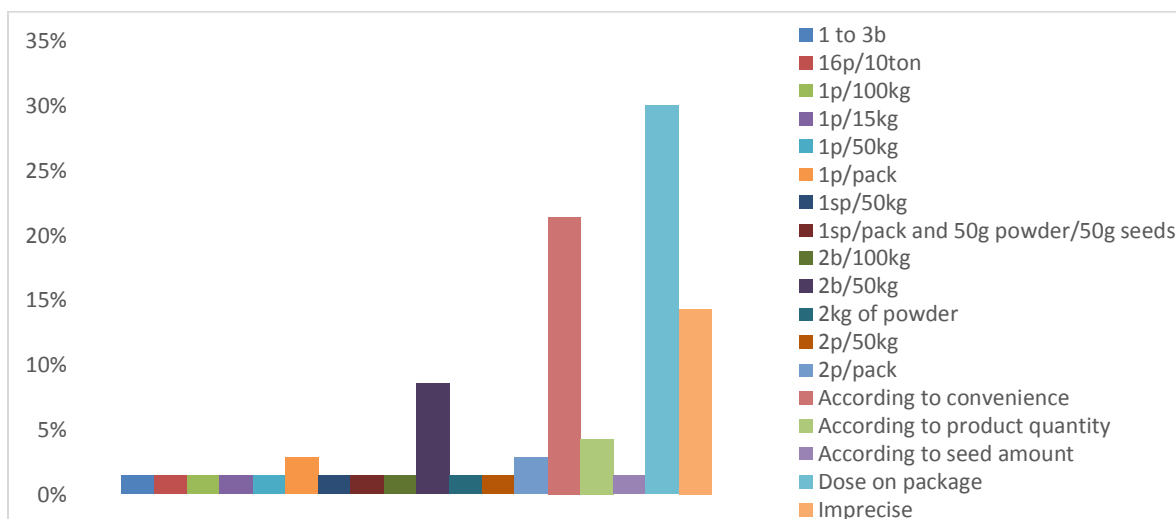


Graph 4:- Producers distributions according to interval between treatments

**Products application and dosage:-**

Only 8% of producers have equipment for the application of their products. These materials range from the conventional equipment (pump, powder, seeder) to that of fortune (black bags). Others apply their products manually by dusting or filing of the pellets on seeds.

The majority of farmers (about 70%) do not respect the doses recommended for products. They apply them at their convenience according to the quantity of available seed and product.

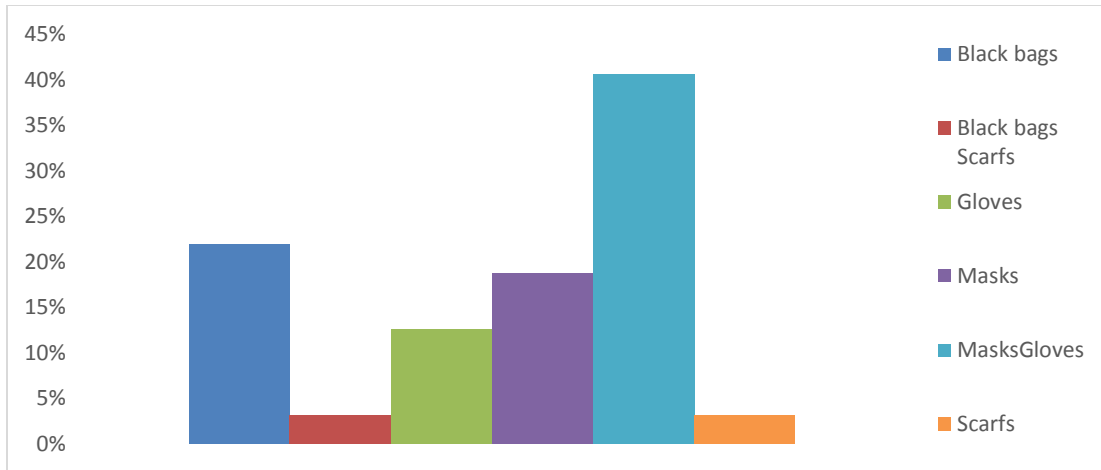


b= bag; p= pellet; sp= spoon

Graph 5:- Producers distributions according to pesticide dose

**Precautionary measures:-**

Producers are aware of the danger incurred during the application of pesticides yet 54 percent of them use any precaution. Those who take carry gloves, masks, scarves or black bags during application. The products being very toxic almost all (except 6%) wash their hands, take a bath or drink milk after the treatment.



**Graph 6:-** Producers distributions according to protection used

#### **Packaging management:-**

No packaging is reused, producers get rid of it in different ways: 42% bury them, 37% throw them into the wild, 10% throw and bury them, 6% incinerate them, 4% incinerate and bury them and 1% bury them and throw them into the toilet.

#### **Discussion:-**

This study shows that many groundnut producers have used pesticides to protect their crops. The most commonly used are those of carbamate family, they are often used in addition to products from other families or enter into the composition of products made up of mixture with another family. These products are more used as powder and pellet. Indeed some have reported inefficiencies of their older products that might be related to bad practices. Such observations were also made in some African countries (Kanda *and al.*, 2006, Obopile *and al.*, 2008).

The dose recommended for insecticide treatments are respected. Producers apply them according to their convenience depending on the amount of product available and peanut. This situation could be explained by the high rate of illiteracy also incriminated by Kanda et al. in 2013. 55% of producers cannot read or write. Among the letters much is Arabist and will not be able to read the indications on packages often entered in french. Like Cissé *and al.* In peri-urban agriculture in 2003, the frequency of treatments varies from one farmer to another, it is the same for their number. It appears from the information received that some even begin their treatment from the seed. All these practices are favorable to the development of resistance in target populations. Pesticide resistance has been reported in some pests in Senegal (Aizan *and al.*, 2016), Cameroon (Brévault *and al.*, 2003). Pesticides treatments have been implicated as a cause of the appearance of resistance in some mosquito species. Larvae develop in the ponds near the fields and are directly exposed to repeated insecticidal treatments (Akogbéto *and al.*, 2005).

Due to a lack of aid and financial means, very few producers have equipment for the application of products. They are obliged to do it manually or to use plastic bags. This method was also denounced by Cissé *and al.*, in 2003 in the Niayes area of Senegal. Many producers, like studies conducted elsewhere, do not protect themselves during treatment (Doumbia and Kwadjo 2009, Ahouangninou *and al.*, 2011). However, they are very conscious of the toxicity of the products used and take some precautions after treatment: Bath, washing hands with soap and bleach and taking milk in some cases. It has been shown that the lack of a means of protection when applying pesticides increases the risk of poisoning (Cisse *and al.*, 2003, Wade 2003, PAN and IPEN 2008, Sene 2008, Naima *and al.*, 2009, Thiam and Sagna, 2009) and that regular exposure to certain active ingredients could lead to the development of disease in long-term (Ahouangninou *and al.*, 2012).

Contrary to the observation of Sougnabe *and al.* (2009), packages are not reused. They are in the majority of cases buried or thrown in the nature, practice that may have consequences on the environment. Environmental problems related to the use of pesticides relate to the quality of water, soil, air and biodiversity (Pimentel *and al.*, 1993). Studies carried out in different regions of Africa have revealed contamination in both surface and underground

waters and soils. Cissé *and al.* (2003) and Traore *and al.* (2006) reported contamination of groundwater in West Africa in Senegal and Côte d'Ivoire.

### Conclusion:-

The use of pesticides for crop protection is adopted by the majority of producers. However, this practice must be well mastered to produce the expected results, otherwise it can become a danger for the user and his environment. This study shows that peanut producers did not meet the doses recommended for these treatments and were highly exposed during manipulations. Moreover, they recognize that these products are harmful to health but mostly ignore the real danger they represent.

In the light of such findings, some measures are needed: training and informing users through awareness campaigns in national languages, due to the high rate of illiteracy observed among farmers, the establishment or the updating of a fund to support producers, a monitoring and evaluation of the various practices.

### References:-

1. AHOANGNINO C., FAYOMI B.E., MARTIN T., 2011. Évaluation des risques sanitaires et environnementaux des pratiques phytosanitaires des producteurs maraîchers dans la commune rurale de Tori-Bossito (Sud-Bénin). *Cahiers Agricultures*, 20 : 216-22.
2. AHOANGNINO C., MARTIN T., EDORH P., BIO-BANGANA S., SAMUEL O., ST-LAURENT L., DION S., FAYOMI B., 2012. Characterization of Health and Environmental Risks of Pesticide Use in Market-Gardening in the Rural City of Tori-Bossito in Benin, West Africa. *Journal of Environmental Protection*, 3:241-248.
3. AIZAN M.A.R.G, THIAW C., SEMBENE M., 2016. Evaluation of resistance of the groundnut seed beetle, *Caryedon serratus* Ol. (Coleoptera, Bruchidae) to different formulations of insecticides. *Journal of applied biosciences*, 101:9577-9588.
4. AKOGBETO M. C., DJOUAKA R., NOUKPO H., 2005. Utilisation des pesticides agricoles au Bénin. *Bull Soc Pathol Exot*, 98 (5) : 400-405.
5. BREVAULT T., BEYO J., NIBOUCHE S., VAISSAYRE M., 2003. La résistance des insectes aux insecticides : problématique et enjeux en Afrique centrale. Jean-Yves Jamin, L. Seiny Boukar, Christian Floret. 2003, Cirad - Prasac, 6 p. <[hal-00142447](https://hal.archives-ouvertes.fr/hal-00142447)>.
6. CISSE I., TANDIA A. A., TOURE FALL S., DIOP E. H. S., 2003. Usage incontrôlé des pesticides en agriculture périurbaine : cas de la zone des Niayes au Sénégal. *Cahiers Agricultures*, 12 : 181-6.
7. DOUMBIA M., KWADJO K.E., 2009. Pratiques d'utilisation et de gestion des pesticides par les maraîchers en Côte d'Ivoire : Cas de la ville d'Abidjan et deux de ses banlieues (Dabou et Anyama). *Journal of Applied Biosciences*, 18 : 992-1002.
8. DPS, 2003. Situation économique et sociale du Sénégal. Ministère de l'économie et des finances, Dakar, Sénégal.
9. KANDA M., WALA K., DJANAYE-BOUNDJOU G., AHANCHEBE A., AKPAGANA K., 2006. Utilisation des pesticides dans les périmètres maraîchers du cordon littoral togolais. *J. Rech. Sci. Univ. Lomé (Togo)*, Serie A, 8 (1) : 1-7.
10. KANDA M., DJANEYE-BOUNDJOU G., WALA K., GNANDI K., BATAWILA K., SANNI A., AKPAGANA K., 2013. Application des pesticides en agriculture maraîchère au Togo », *Vertigo - la revue électronique en sciences de l'environnement* [En ligne], Volume 13 Numéro 1 | avril 2013, mis en ligne le 16 avril 2013, consulté le 04 avril 2017. URL : <http://vertigo.revues.org/13456> ; DOI : 10.4000/vertigo.13456
11. NAIMA R., ASMAE K., SANAE A., ABDELMJID S., RACHIDA S. B., 2009. Facteurs prédictifs de gravité de l'intoxication aux pesticides: Expérience du Centre Antipoison du Maroc. *Annales Toxicologique Analytique*, 21 (2) : 79-84.
12. OBOPILE M., MUNTHALI D.C., MATILO B., 2008. Farmers' knowledge, perceptions and management of vegetable pests and diseases in Botswana *Crop Protection* 27: 1220-1224.
13. PAN, 2006. Document d'information sur la gestion des pesticides au Sénégal. Pesticide Action Network Africa, Dakar.
14. PAN et IPEN, 2008. Etude sur l'interdiction de l'endosulfan dans les Etats du CILSS. Pesticide Action Network-Afrique, Dakar.
15. PIMENTEL D., ACQUAY H., BILTONEM M., RICE P., SILVA M., NELSON J., LIPNER S., GIORDAN S., HOROWITZ A., D'AMORE M., 1993. Assessment of Environmental and Economic Impacts of Pesticide Use

- In: PIMENTEL D. and LEH-MAN H., Eds., *The Pesticides Question, Environment, Eco-nomics and Ethics*, Routledge, Chapman and Hall, New York.
16. SENE M., 2008. Pratiques d'utilisation des pesticides et teneurs en résidus des produits horticoles dans la zone des Niayes de Mboro : effets éventuels sur la santé publique. Thèse de pharmacie, Dakar: UCAD.
  17. TRAORE S. K., MAMADOU K., DEMBELE A., LAFRANCE P., MAZELLIERT P., HOUENOU P., 2006. Contamination de l'Eau Souterraine par les Pesticides en Régions Agricoles en Côte-d'Ivoire (Centre, Sud et Sud-Ouest). *Journal Africain des Sciences de l'Environnement*, 1 :1-9.
  18. THIAM A., SAGNA M. B., 2009 «Monitoring des pesticides au niveau des communautés à la base. Rapport régional Afrique,» PAN Africa, Dakar, Sénégal.
  19. Wade C. S., 2003. L'utilisation des pesticides dans l'agriculture périurbaine et son impact sur l'environnement: étude menée dans la région de Thiès. Thèse de pharmacie, Dakar: UCAD.