

## Research Article

### PERCEPTIONS OF PESTICIDES IMPACTS ON AGRICULTURAL SOILS IN THREE LOCALITIES OF NORTHERN CAMEROON (SANGUÉRÉ-PAUL, DJALINGO AND BABLA)

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#### ABSTRACT

Despite their dangers, plant protection products continue to be used throughout the world and in developing countries, in which Cameroon is one of them. This study was carried out in order to gather the perceptions of farmers on the impacts of pesticides on agricultural soils and finally to propose alternatives for solving agricultural/environmental problems. 225 people were concerned with the known as study. The method used to collect farmers perceptions is based on interviews conducted with farmers in the survey areas (semi-structured interviews and focus group). The results show that 46% of the farmers surveyed use only herbicides in the field, 39% combine herbicides with insecticides, and 15% combine herbicides with insecticides and fungicides. The most widely used pesticide is Round up, despite its ban. It is followed by Gramosol, Atrazine, Kalach, and Duiron. 135 people (60%) of the farmers surveyed qualify the agricultural environment as moderately good (farmers having staying between 6 and 20 years and over 20 years in the study localities). 8% say it is poor quality. The perception of the quality of the agricultural environment depends very much on the residence length. 173 people (77%) of the farmers surveyed have noticed a degradation of the soil since they began to use pesticides in the field. 85% noted a proliferation of weeds/insects in fields treated with pesticides. 91% also observed a proliferation of new species of grass/insects in fields treated with pesticides. Majority of the farmers surveyed (60%), believes that instead of pesticides, the use of agricultural machinery is better and will allow them to boost their agricultural production while protecting the soil and the environment.

**Keywords:** Peasant perceptions, Pesticides, Agricultural machinery, Agricultural productions, North Cameroon.

#### INTRODUCTION

The use of pesticides in agriculture has been considered as necessary evil to guarantee the effective protection of farmer's crops, which guarantees productivity that meets his objectives (Olina et al., 2015). These pesticides (insecticides, fungicides, herbicides, etc.) increased agricultural production, land productivity and labor during the fifty past years. At the same time, the negative externalities resulting from the use of these inputs and their toxicity have increasingly posed environmental problems affecting ecosystems and human (Olina et al., 2015). These externalities include damage of agricultural land, livestock, flora and fauna (Wilson et al., 2001) In some African countries, several studies and works have highlighted the non-respect of good agricultural practices by producers (Lendres, 1999; Domo, 1999; Toé et al., 2000; Toé et al., 2002; Okoumassoum et al., 2002; Traoré et al., 2006). Indeed, there is a non-compliance with doses and the treatment schedule, the use of products at times when it is not recommended, a non-recommended mixture of products, a non-respect of the hygienic attitudes recommended during the treatments, improper disposal of leftover products and empty packaging (Toe et al., 2010). In the North Cameroon region, the use of pesticides has become essential for crops. There has been an incessant increase of pesticide use over the past 20 years, particularly herbicides (of commercial name: Paraquat, Glyphosate, Diuron, and Atrazine) in cotton-cereal rotation systems, especially since the extension of the no-till technique (Dugue et al., 1999). These pesticides used in fields have negative impacts in various compartments of the ecosystem (Tissier et al., 2005).

In this part of the country, the peasant perception of the impacts of pesticides on agricultural soils remains for the majority of farmers very outdated. They believe that the perpetual use of these chemicals will be responsible for the decline in the fertility of their croplands and loss of biodiversity. Peasant perceptions therefore represent an important socio-cultural factor, which guides the choice of innovations and determines their adoption (Pannell, 2007). The objective of this study is therefore to gather the perceptions of farmers on the impacts of pesticides on agricultural soils and finally to propose alternatives for resolving agricultural/environmental problems, which is increasingly growing in this part of the country.

#### MATERIAL AND METHODS

##### Location of the study area

The area covered by our study is located in the Garoua 3 district (area of approximately 432.5 km<sup>2</sup>) and is limited: to the North by the Benoue River; to the south, east and west by Ngong commune (PCD, 2011). The figure 1 shows the location of these different zones. The climate is a Sudanese type, characterized by an annual rainfall between 1000 and 1100 mm and mean annual air temperature of 28 °C (Olivry, 1986). The vegetation consists of tall grasses, deciduous trees and savannahs (Letouzey, 1985). The superficial formations are constituted of ferruginous soils and vertisols (Raunet, 2003).

##### Choice of localities

Two (02) criteria were used when choosing the study zones:

- The localities of Sanguere Paul, Babla and Djalingo, represent larges places where there are large periodic market. They are

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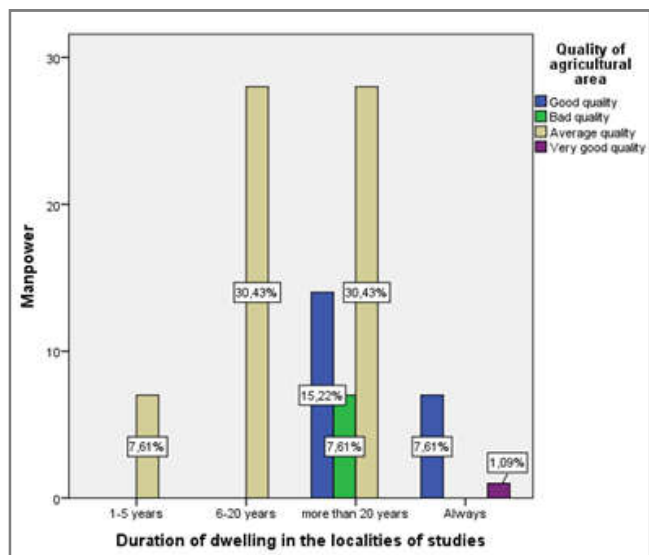


Figure 4. Perception of the quality of the agricultural environment according to the length of residence

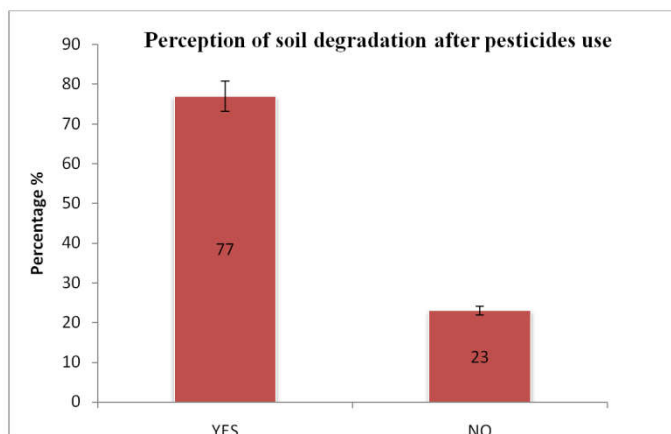


Figure 5. Perception of farmers on soil degradation due to pesticides

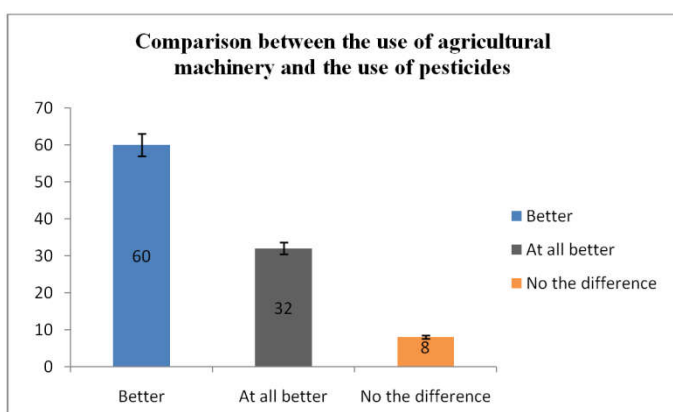


Figure 6. Comparison between the use of agricultural machinery and the use of pesticides

On another question, which is whether the yields produced are good quality compared to previous years, 69% say "Yes" and 31% say "No". Those who say "No" attribute it to declining soil fertility, overuse of pesticides and soil degradation. 85% of the farmers surveyed said they observed an increase in the proliferation of weeds / insects in their fields treated with pesticides. Only 15% have not observed any change in their field treated with pesticides. 91% also say they have observed an overgrowth of new herb / insect species, and only 9% say they do not observe anything at all. This proliferation of new species and weeds is explained by an over dosage of pesticides, a lack of crop rotation, poor use of agricultural equipment and

continuous use of the same type of pesticides on a plot. Finding also made by Picard (2018). Figure 6 opposite presents the comparison made between the use of agricultural machinery and the use of pesticides. 60% of the farmers surveyed find the use of agricultural machinery better compared to pesticides. 32% do not find it better and only 8% do not find any difference between the both. The 60% of farmers surveyed justify their choice by mechanical rotation of the land because there is no soil degradation and pollution when using agricultural machinery.

### CONCLUSION

The present study, conducted on peasant perceptions of the impacts of pesticides on agricultural soils to propose alternatives for solving agricultural / environmental problems in three localities in the North Cameroon region (Sanguere-Paul, Djalingo and Babla). The study permit us to affirm that the peasant perception of the impacts of pesticides generally depends on the number of years of residence in the locality. The longer peasants spend the time in the locality, more their perception differs, compare to those who have not passed enough the time. For the peasants, pesticides, particularly herbicides would cause a "weakening" of the land and a decrease in fertility when they are applied regularly in the plots. This can be verified for example by the presence of sandy beaches in cultivated plots, the appearance of certain weeds / insects and new species of grass / insects which were rare before the introduction of herbicides. According to them, it would be wise to use instead of pesticides, agricultural machinery which seems to be better and will at the same time allow them to increase their agricultural production while protecting the soil and the environment around them. This is why crop rotations are strongly recommended. A study should be carried out to identify new herbaceous / insect species that have appeared in the field and to observe their behavior in nature. Likewise, the use of agricultural machinery and the use of plant extracts such as Neen, Khayasenegalensis etc., for their pesticidal effects in the field instead of the use of chemical pesticides should be increasingly suggested to peasants, for a stabilization of agricultural soils pollution which is severely increasing nowadays in this part of the country.

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