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Applied Cognitive Evaluation of Citrus Producers Related to
Agricultural Operations for Citrus Orchards (al-Gorair Region - Merowe Locality
- Northern State - Republic of Sudan)

Amna Hassan Widaa¹, Ahmed Hamdi Allagabo^{2*}

¹Ministry of Agriculture - Khartoum State, Technology Transfer and Extension,

²Federal Ministry of Agriculture, Agricultural Extension and Technology Transfer, Sudan

Abstract

Studying knowledge in countries such as ours in the third world is very important, especially with the spread of illiteracy and lack of education among large groups of the population, especially among the rural population, who are mostly farmers, in addition to poor agricultural extension coverage. The aim; of the study is cognitive and applied evaluation of agricultural practices for citrus producers, to achieve this aim- the study was conducted in the Al-Gorair region - Northern State - Republic of the Sudan- in 50 orchards to grow citrus trees, which contain about 2454 citrus tree in total with an average of 52 tree per orchard. A questionnaire was prepared to measure the farmers' knowledge and application level of agricultural operations in citrus orchards on three axes (axis of citrus orchards establishment, tree pruning operations, other agricultural operations of irrigation, fertilization, identification of insects, diseases and control) Each of those three axes contained a group of items. The data were analyzed and frequencies and percentages were used, to describe the knowledge about the elicited issues with regards to the Citrus Orchards in the study area. The study clearly shows that there is a general weakness in knowledge and application of agricultural operations in citrus orchards. The study recommends that the responsible authorities (agricultural extension, Horticultural Sector, Agricultural Research in the Northern State - Republic of Sudan) intensify activities that increase the knowledge of farmers in Al-Gorair region on agricultural operations in citrus orchards to increase knowledge percentage and therefore an application of good methods was recommended to increase the citrus productivity which it will increase the farmers income in the region.

KEY WORDS: Citrus Orchards, Agricultural Operations, al-Gorair Region

* **Contact Address:** Ahmed Hamdi Allagabo, e-mail: ahmedhamdi80@gmail.com

METHODOLOGY

The study was conducted in the Al-Gorair region - Northern State - Republic of the Sudan in 50 orchards to grow citrus trees, which contain about 2454 citrus tree with an average of 52 tree per orchards. The primary data were collected by a questionnaire prepared to measure the 50 orchards Farmers knowledge and application level of agricultural Orchards establishment, trees pruning

operations in citrus operations, other agricultural operations of irrigation, fertilization, identification of insects, diseases and control), each of those three axes contains a group of items. The data were analyzed with SPSS software in order to extract the frequency and percentage to describe the general condition of Citrus Orchards in the study area.

RESULT AND DISCUSSION

Table (1) Percentage of the respondents according to their Knowledge and application in creation and establishing Citrus Orchards, pruning Citrus Trees, Irrigation, Fertilization and Insects:

Item No.	Axis	Know and apply	don' t know and don' t apply	don' t know and don' t apply
1	Creation and Establishing axis	28%	1%	71%
2	Pruning axis	47%	7.7%	45.3%
3	Irrigation, Fertilization and Insects axis	56%	3.2%	40.8%

Table (1) shows that knowledge and application regarding establishment of the orchard from the beginning among respondents was low (28%), this percentage is average of:

- 1- (26%) of the respondents had knowledge and application to protect the orchards with windbreaks,
- 2- (4%) of the respondents had knowledge and application of the recommended distance between the windbreak trees and the beginning of the citrus trees (3 meters). Therefore, even the farmers who had knowledge and application of the windbreaks importance were leaving a distance of more than (6 meters) and this wastes an area that was can be used to plant more trees.
- 3- (28%) of the respondents were provided with knowledge from the responsible institutions (extension, orchards) in selecting and electing seedlings and citrus varieties, and they relied for selection on the market and nurseries only.
- 4- (54%) had knowledge and application to properly plan the orchard to accommodate the windbreaks location and method of distributing irrigation schedules and loading the orchard with the appropriate number of trees.

Also, table (1) shows that knowledge and application regarding citrus trees pruning operations among respondents is low (47%), this percentage is average of:

- 1- (70%) of the respondents had knowledge and application to carry out the pruning their trees process.
- 2- (62%) of the respondents had knowledge and application to do pruning in order to strike a balance between vegetative and fruity growth to fruits organize and raise fruit quality.
- 3- (66%) of the respondents had knowledge and application to carry out pruning according to the research recommendation every (every year and after fruits collecting) taking into account some varieties.
- 4- (58%) of the respondents had knowledge and application to carry out the trees pruning to trees replenishing.
- 5- (10%) of the respondents were provided with knowledge and application to perform pruning trees to replace varieties.
- 6- (36%) of the respondents had knowledge and application to carry out of trees pruning in (Late Winter or during Autumn) as recommended.
- 7- (26%) of the respondents were provided with knowledge and application to cover the pruned trunk and trees parts or a main branches to protect

them from sunlight in addition to cleansing wounds caused by the pruning process.

Also, table (1) shows that knowledge and application regarding to other agricultural operations (irrigation, fertilization, insect knowledge and control) was good (56%), this percentage is average of:

- 1- (44%) of the respondents had knowledge and application of trees irrigation periods.
- 2- (4%) of the respondents had knowledge and application to use recommended irrigation methods such as Double rings irrigation (and/or) drip irrigation.
- 3- (66%) of the respondents had knowledge and application to irrigate the trees with heavy irrigation two weeks before the flowers, and do not resort to irrigation after the fruitfulness and fruit growth period from May to October, and increase irrigation rate during July and August.
- 4- (90%) of the respondents were provided with knowledge and application to carry out constantly fertilize the trees.
- 5- (76%) of the respondents were provided with knowledge and application regarding Know harmful insects and diseases, and asking for help to control.

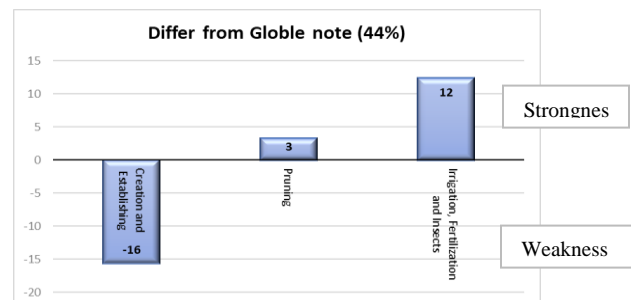
The Strengths and Weaknesses in the study Axis:

Figure (1) shows the strengths and weaknesses between knowledge and application axes of agricultural operations in the citrus orchards in the study area, where the general mean of knowledge and application was calculated as follows:

$$\text{Globe Note} = (28\% + 47\% + 56\%) / 3 = 44\%$$

As knowledge and application percentage of the citrus orchards establishment axis (27%), the trees pruning axis (47%), and axis of the irrigation operations and constantly fertilize and Knowing harmful insects and diseases, and asking for help to control (56%). To calculate a strengths and weaknesses of knowledge and application axis of respondents related to agricultural operations in citrus orchards, the percentage of the axis was subtracted from the general average of knowledge and of application percentage, where it is clear that there is a general weakness in knowledge and application of agricultural operations in citrus orchards (44%), where knowledge and application of creation and establishing of citrus orchards axis in the study area is an obvious weakness (-16% below the general average), knowledge and application to trees pruning axis reflects a relative strength point (3% above the general average), knowledge and application is reflected in other agricultural operations in citrus orchards (irrigation operations and constantly fertilize and Knowing harmful insects and diseases, and asking for help to control) a strength point (12% above the general average). But in general, the knowledge and application of agricultural operations in the citrus orchards in the study area were weak (44%).

Figure (1) shows the strengths and weaknesses between the axes:



CONCLUSION

Poor knowledge is not the main or only determinant of agricultural productivity, as there are many other factors. Studying knowledge in countries such as ours in the third world is very important, especially with the spread of illiteracy and lack of education among large groups of the population, especially among the rural population, who are mostly farmers. The study and evaluation of the knowledge level is also important to focus efforts in specific aspects of the agricultural process in order to gain time and effort and accelerate the collection of revenue. Knowledge of increasing productivity per area unit.

RECOMMENDATIONS

- The study recommends that the responsible authorities (agricultural extension, Horticultural Sector, Agricultural Research in the Northern State - Republic of Sudan) intensify activities that increase the knowledge of farmers in Al-Gorair region on agricultural operations in citrus orchards to increase knowledge percentage and therefore an application of good methods recommended to increase the citrus productivity which it will increase the farmers income in the region.

- The study recommends that the Agricultural Extension at the federal level to provide logistical support to the state responsible authorities in order to intensify extension activities, in particular those related to the creation of citrus orchards in the North State and other states specializing in citrus planting states.

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