An-Najah National University

Faculty of Graduate Studies

STUDYING THE FACTORS AFFECTING PROTECTED AGRICULTURE FARMERS' ADOPTION OF PALESTINIAN GOOD AGRICULTURAL PRACTICES (PAL-GAP) IN THE NORTHERN WEST BANK

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Dedication

To the soul of my father, my mother, and my martyred brother, to my husband, sisters, brothers, friends and family.

I dedicate this project

Acknowledgements

I would like to express my deepest respect and most sincere gratitude to my supervisor Dr. Tawfiq Qubbaj for his guidance at all stages of my work.

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Special thanks to the all Farmers who filled out the questionnaire under study .

Declaration

I, the undersigned, declare that I submitted the thesis entitled:

STUDYING THE FACTORS AFFECTING PROTECTED AGRICULTURE FARMERS' ADOPTION OF PALESTINIAN GOOD AGRICULTURAL PRACTICES (PAL-GAP) IN THE NORTHERN WEST BANK

I declare that the work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

Student's Name: **Haneen Al-Masri**

Signature: 

Date: **15/07/2025**

List of Contents

List of Tables

List of Figures

List of Appendices

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Abstract

Agriculture in Palestine plays a central role in national, cultural, economic, and social life. It provides job opportunities, increases income, and ensures food security for many families. The Palestinian government seeks to promote Good Agricultural Practices (PAL-GAP) as part of its strategy to guide farmers toward sustainable, environmentally safe, and economically viable production. These practices aim to improve farmer income, ensure safe and healthy crops, and open access to new local and international markets.

This study investigates the factors influencing the adoption of PAL-GAP by farmers in the northern West Bank. A random sample of 291 irrigated vegetable farmers was surveyed using a questionnaire. The first section collected demographic and farm-related data such as age, education, family size, farm area, income, and participation in community institutions. The second section focused on farmers' awareness, interest, and evaluation of GAP, as well as their actual implementation of such practices on their farms.

The findings reveal that only 10% of farmers currently hold a PAL-GAP certificate. However, most apply some form of good agricultural practices, and many show willingness to adopt the full system if provided with adequate support. Farmers' awareness of GAP was relatively high at 71%, and their interest and evaluation levels were also strong. Despite this, implementation remains at a moderate level due to limited financial resources.

The study highlights the need for greater awareness programs, workshops, and training sessions that explain certification requirements and offer practical guidance for applying GAP. Financial support is essential to enable farmers to pursue certification and fully adopt the system. In addition, the establishment of advanced packaging and processing centers would improve product quality, enhance shelf life, expand marketing

opportunities, and increase the competitiveness of Palestinian agricultural products locally and abroad.

Keywords: Factors Affecting, Farmer's, Adoption, Palestinian Good Agricultural Practices.

Chapter One
Literature Review

1.1 Introduction

Agriculture in Palestine is considered an essential part and component of the Palestinian national, cultural, economic and social fabric, as the sector is vital in creating seasonal job opportunities, raising the level of income and achieving food security for a large number of Palestinian families. The importance of agriculture extends to all stakeholders involved in the production and distribution chain of agricultural products. This has motivated relevant parties to actively ensure the safety of agricultural products at every stage—from the producer (farmer) to the market, and ultimately to the consumer. (Ministry of Agriculture, 2022)

To achieve this, specialized modern programs have been adopted to guarantee the safety and security of agricultural and food products from chemical residues and other pollutants beyond locally and internationally accepted limits. These programs also aim to enhance product quality, ensure environmentally sustainable production practices, and promote safe working conditions for farm and facility workers. Ultimately, these efforts respond to growing consumer demand and the public's right to access safe, high-quality food products. (Palestine Standards Institution, 2022)

The Palestinian government seeks to direct agricultural production systems towards sustainable and environmentally safe agriculture and to contribute to improving farm income by directing Palestinian farmers to produce healthy and safe crops and deliver them to new markets through preparing and developing a specification for good agricultural practices to help and work to achieve the goals of the Palestinian PAL-.GAP. Encouraging and adopting good and economically feasible agricultural practices, so as to promote the reduction of agricultural chemical inputs locally and the development of good agricultural practices while ensuring the application of a complete and comprehensive system of crops from the farmer to the consumer. By providing a guide that provides basic and practical information to the farmer about the best good agricultural practices that the farmer must follow according to the work environment and Palestinian agriculture. (Palestine Standards Institution, 2022)

The decline in land holdings and the use of the intensive agricultural production system in Palestine has led to a significant increase in the use of agrochemicals. This has caused severe damage to the environment and public health. The transition to a secure agricultural system will need to explore possibilities along the agri-food value chain as decisions need to be made by a wide range of partners and actors within the value chain, starting from producers, stakeholders, traders, and final consumers. Therefore, the proposed study aims to know the degree of awareness of the Palestinian farmers to implement the PAL GAP certificate granted by the Palestine Standards Institution (PSI), which determines the quality of Palestinian agricultural products and which enhances the Palestinian consumer's confidence in the local agricultural product, in addition to measuring the extent of the farmer's desire and knowing the tendencies and degree of farmer adoption of agricultural practices. Good quality, which helps it to obtain a marketing advantage in the local market and foreign markets. (Palestine Standards Institution, 2022)

This study aimed to determine the training needs of farmers required to implement the control points and standards of the PAL-GAP certification. It also sought to identify the main challenges preventing farmers from obtaining the PAL-GAP certificate and to develop practical recommendations for providing appropriate technical and financial support to agricultural holdings.

1.2 Theoretical basis

The Palestinian good agricultural practices system PAL-GAP is the first national system to specialize in monitoring the quality of Palestinian agricultural products at farm level. PAL-GAP was developed by a national team established by the Palestinian Standards Institution (Palestine Standards Institution, 2022), considering the Palestinian agricultural context while aligning with the principles of Good Agricultural Practices (GAP) as outlined in the Global-GAP system. The team included representatives from key national stakeholders and government authorities such as the Ministry of Agriculture, the Palestinian Ministry of National Economy, national universities, non-governmental organizations (NGOs), farmers' unions, and other relevant entities. This initiative supports the Palestinian government's development plans for agricultural clusters word "PAL GAP" stands for (PAL is an abbreviated Palestinian word, and GAP means good agricultural practices. It is a national system issued by the PSI in cooperation with its

main partners, such as the Palestinian Ministry of Agriculture (MOA). PAL GAP system is defined as a set of voluntary standards issued in a system aimed at Establishing controls for good agricultural practices along the agricultural value chain. It requires commitment and application of a set of standards concerned with the administrative aspects of the farm, the environment, the safety of workers, and the traceability of products, and it focuses on the safety of the agricultural product for consumption (Palestine Standards Institution, 2022).

1.2.1 Challenges in Agricultural Production and Agrochemical Use in Palestine

Declining land holdings and intensive agricultural production systems in Palestine have led to a significant increase in the use of agrochemicals (Marzin, Uwaidat, & Sourrisseau, 2019). This has caused severe consequences on the environment and public health. Several studies have reported such an impact (Miyah, Benjelloun, Lairini, & Lahrichi, 2022). The lack of national standards for safe agricultural production and weak national resources have limited the ability to formally monitor agrochemicals' use in the Palestinian agricultural production system.

The conversion into a safe agricultural system would need to explore the potential along the agri-food value chain. Decisions need to be made by a wide range of actors, including producers, concerned- institutions, traders, and end consumers.

1.2.2 Emergence and Development of Good Agricultural Practices (GAP)

The concept of Good Agricultural Practices (GAP) has emerged in recent years in the context of the rapid change of the food economy and its globalization to reach high agricultural production and high- quality crops at the farm level, and then satisfy the consumer by paying attention to food quality .The Good Agricultural Practices standards were developed in 1997 by a group of European producers and retailers who formed the so-called "European Retailers Association", which was known as the EUROPE GAP specification, which changed in 2007 to GLOPAL-GAP. (Abd Elsalam & Elnagar, 2021)

Global-GAP is an internationally approved and recognized standard that ensures good agricultural practices and serves as a guarantee of food safety, workers' health care and safety, and environmental protection, The standards apply to agricultural products, aquaculture and livestock breeding. Aims to promote sustainable agriculture around the world that guarantees consumers and retailers uniform standards of food safety by

implementing HACCP system, traceability and segregation of products and focusing on recall and recall procedures, and Global-GAP is widely helpful for the record-keeping system and product quality improvement. (Economic and Social Commission for Western Asia, 2020)

1.2.3 Development of Palestinian Good Agricultural Practices (Pal -GAP).

Palestinian Good Agricultural Practices (PAL GAP) is a system of agriculture quality standards based on global best practices and tailored to the Palestinian context and needs. The system aims to improve food safety and quality in the agri-food sector in Palestine. It will increase farmers' ability to produce and sell agri-food that complies with PALGAP standards. Adopting such standards will lead to safer, higher-quality dairy and agriculture products, increasing farmer income. The creation and application of PAL GAP systems will also reduce or eliminate risks related to (i) worker health and safety, (ii) environmental impacts, and (iii) food safety and quality. Ultimately, this will increase demand for high-quality, environmentally friendly agricultural inputs and support sustainable agricultural production and consumption growth. (Palestine Standards Institution, 2022)

1.2.4 Farmers' Knowledge and Adoption of Good Agricultural Practices (GAP)

1.2.4.1 The Importance of Good Agricultural Practices (GAP) and Farmer Safety Measures"

Good Agricultural Practices are defined as standards for agricultural production that ensure the safety and security of food and those working to produce it according to sustainable agricultural practices. It is also an internationally accredited certificate, awarded to farms that apply these modern and sound standards. (Economic and Social Commission for Western Asia, 2020)

Abd Elsalam & Elnagar (2021) defined good agricultural practices according to the food and agricultural organization as applying the available recommendation and knowledge to produce secure and safe food while considering the environmental, economic, and social sustainability of agriculture production.

And it's known as the available knowledge to treat the environmental, economic, and social sustainability of production procedures on the farm and after production to produce

safe food and non-food agriculture products, According to FAO, good agricultural practices are defined as: "the application of available recommendations and knowledge to produce safe and healthy food taking into account the environmental, economic and social sustainability of agricultural production, and defined as the knowledge available to address the environmental, economic and social sustainability of on-farm and post-production production processes to achieve safe food and non-food agricultural products. (Abd Elsalam & Elnagar, 2021)

1.2.5 The Guide of the Good Agricultural Practices

GAP is a guideline for the management of agricultural produce, from seed preparation, planting, growing, and harvesting through to post-harvesting. The aim is to create safety standards for both domestic and international markets while minimizing environmental damage. According to GAP is based on the principles of risk prevention, risk analysis, and sustainable agriculture using integrated pest management (IPM) and integrated crop management (ICM) for the continuous improvement of farming systems. Furthermore, the GAP standards hold the potential to actualize a broader inclusion of small-scale producers toward the attainment of social, economic, and environmental benefits. (Pheesphan, Shivakoti, & Soni, 2019).

In the guide of Good agricultural practices established by Arab organization in the year 2007 that Good agricultural practices include fourteen control points that farmers are obliged to apply in different proportions: (1) tracking, (2) record keeping, (3) plant varieties and origins, (4) date and place of cultivation, (5) soil and equipment management, (6) fertilizer use, (7) irrigation and fertilization with irrigation water, (8) crop protection, (9) harvesting, (10) product handling, (11) waste management to prevent pollution , (12) crop health and safety, (13)Environmental issues, (14) Product Dealer Form (Arab Organization for Agricultural Development, 2007).

Abu Dhabi Agriculture and Food Safety Authority defined good agricultural practices as agricultural production standards that ensure the safety and security of food and those working to produce it according to sustainable agricultural practices. It is also an internationally accredited certificate, awarded to farms that apply these modern and sound standards (Economic and Social Commission for Western Asia, 2021)

The National Good Agricultural Practices Guide in Abu Dhabi addressed the development of the good agricultural practices system and the application of agricultural production quality standards by paying attention to three points: food safety, the welfare of workers, and sustainable management of the environment (Economic and Social Commission for Western Asia, 2020). In comparison with the Good Agricultural Practices Manual in Saudi Arabia, the guide dealt with a set of standards applied to agricultural plant production to ensure the safety and sustainability of food, protect the environment and the sustainability of its natural resources, and maintain the health, safety and care of workers. With the aim of enhancing consumers' confidence in local agricultural products by obtaining healthy and safe food product and expanding marketing opportunities (Ministry of Environment, Water and Agriculture, 2024).

1.2.6 Adopting the Good Agricultural Practices

The process of adopting agricultural innovations is one of the most important determinants of the success of agricultural extension and the impact of extension services provided on the beneficiary public .The adoption process is described as the continuous decision to implement the new practice or apply new technologies, and that adoption is a psychological variable associated with the social and economic situation, so it is necessary to measure it with a higher statistical scale for its relative importance in agricultural development and agricultural extension (Abd Elsalam & Elnagar, 2021).

The farmers in the Gharbia Governorate, where the study was conducted, have limited awareness of the importance of applying Good Agricultural Practices (GAP). Accordingly, the study recommends organizing workshops to raise farmers' awareness of GAP, particularly concerning potato cultivation. (Amer, Nawara, & Al Atrabi, 2023)

The adoption of agricultural practices is a complex process involving several mental and behavioral stages that an individual or adoption unit progresses through. Therefore, simply measuring the extent to which respondents implement Good Agricultural Practices (GAP) does not, on its own, indicate true adoption. Instead, it is essential to assess the individual's behavior and progression from initial awareness of the practice to its actual implementation. Abd Elsalam and Elnagar (2021) emphasize the need to develop a comprehensive framework for measuring the adoption of agricultural innovations more

broadly. Such a framework can then be applied to assess the adoption of specific Good Agricultural Practices in the Assiut Governorate.

Knowledge and adoption of the concept of good agricultural practices regarding farmers' understanding of soil and water management and the use of fertilizers based on soil analysis, knowledge of the benefits of compost, the use of necessary techniques and the provision of clean conditions contributed to reducing the losses of lost fruits of serum in the harvest and post-harvest period of the crop (Aly & Mohamed, 2023).

Many researchers have used multiple methods to measure adoption, the most important of which are the method of selecting from two responses (yes, no), determining an indicator for adoption using the sigma scoring method, calculating the percentage of adopters, determining numerical values for each stage of adoption, using a scale similar to the Likert scale, and average scores for levels of adoption. (Abd Elsalam & Elnagar, 2021).

Knowledge is a power and wealth at the same time and is the real nerve of institutions today as the most important resource in the twentieth century and is considered a purposeful and contemporary administrative means to adapt to the requirements of the modern era, and is considered a set of processes that help develop the knowledge necessary for the implementation of various agricultural activities, and many have differed in the definition of the concept of knowledge management, defined by (Fathy, Anwer, Ramadan, & Barga, 2023) defined it as the continuous challenge to identify, activate, develop, save, disseminate, promote, use and reuse knowledge to respond to those targeted by providing a distinctive service, through the previous definitions, it can be said that knowledge management is a series of processes that must be followed in order to obtain knowledge and benefit from it in the future, and on this basis knowledge can be defined as a set of practices and activities carried out by the organization. Agricultural extension with the aim of determining agricultural knowledge. (Fathy, Anwer, Ramadan, & Barga, 2023)

In a study on a sample from Assiut Governorate on the adoption of good agricultural practices by farmers, the Sigma Scoring method was adopted, where this method is based on considering adoption as a behavior that goes through five main stages: awareness, interest, evaluation, experimentation, and adoption. The development of this framework

went through five stages: (a) calculating the percentages of respondents' responses across the five stages of adoption: awareness, interest, evaluation, experimentation, and adoption, (b) converting the respondents' response ratios (yes, no) at each stage into standard scores using the Sigma Scoring method, (c) calculating the standard scores of adoptees according to the years of their adoption of the practice using sigma scoring, (d) collecting the standard scores of each respondent in the five stages of adoption and the standard scores of the adoptees according to the years of adoption to express the degree of adoption for each practice, (e) Determine the minimum and maximum degrees of adoption for each practice (Abd Elsalam & Elnagar, 2021).

The study in Assiut Governorate indicates on a sample of farmers that the stages of adoption of good agricultural practices were calculated using standard Z values. The results when measuring the standard scores of respondents and respondents with "yes" for the stages of "awareness, interest, evaluation and experimentation" were (4), and the degree of respondents responding to "no" (0) in six practices: the existence of administrative and financial records on the farm, recording all agricultural operations, making use of records in solving problems, making a comparison of production through records, and disinfecting the tools used in collecting Crop. While these standard scores reached varying degrees in the rest of the six practices, where the "yes" response scores ranged between 4-6 and the "no" response ranged from 1-3 degrees. (Abd Elsalam & Elnagar, 2021)

1.2.7 Impact of PAL-GAP on Agricultural Productivity and Sustainability

Farmers track consumer behavior, market information, and production to contribute improving farmers' performance in managing costs, production techniques and types of agricultural products by tracking the GAP system, carrying out health and environmental measures, and food safety as a prerequisite for agricultural trade between countries since 1988, while the system established a standard Q-GAP for food safety certification in 2004 (Pheesphan, Shivakoti, & Soni, 2019).

This study shows a noticeable difference between the level of knowledge of good agricultural practices for strawberry farmers and the level of implementation of farmers of good agricultural practices due to their lack of skills and ingredients necessary for the performance and application of practices, and this requires increasing the activity of

agricultural extension in increasing farmers' awareness and providing them with skills in good agricultural practices. (Elshazly & Awadalla, 2020)

Agricultural extension aims to bring about desirable changes in the behavior of farmers, including knowledge and awareness of the farmer of the technological developments used in the development of the concept of good agricultural practices, and contribute to increasing knowledge, awareness and development of farmer's technical skills in behavioral changes that achieve the main goal of agricultural extension. (Al Faris , 2007)

The study indicates that the most important problems and obstacles facing farms when applying serious agricultural practices are the high costs of applying good agricultural practices due to the small number of equipment and mechanisms in addition to the high adaptation of production requirements of organic and chemical fertilizers. (Amer, Nawara, & Al Atrabi, 2023)

The study reports that the high of all indicators of productive and economic efficiency of the method of good agricultural practices compared to the traditional method of potato production, where it was found that the most efficient elements are organic fertilizer and chemical fertilizer, while the most elements in the lack of efficiency were the elements of pesticides and municipal fertilizer. (Amer, Nawara, & Al Atrabi, 2023)

In the study of the factors influencing of adoption of good agricultural practices (GAP), The results revealed that the income variable is the most influential factor in the GAP adoption by participating vegetable farmers and that the location factor exerts the most influence over the growers' export decision, The risks of food safety and quality hazards can be minimized through the adoption of good agricultural practices (GAP). (Pheesphan, Shivakoti, & Soni, 2019).

The results of a study indicate a decrease in the respondents' adoption of four of the good agricultural practices studied, respectively: the use of the Internet to obtain information (13.8 degrees), the presence of a product brand (14.6 degrees), the analysis of irrigation water every period (17.5 degrees), the presence of cars equipped to transport the crop (18.1 degrees), while these scores were high in the eight practices, which are the work of administrative and financial records for the farm. Recording all agricultural operations, using records to solve problems, making a comparison of production through records, disinfecting the tools used in collecting the crops, having a place designated for packing

and sorting, conducting soil analysis, analyzing toxic residues. (Abd Elsalam & Elnagar, 2021)

The study of the Agricultural Conservation Practices indicates that without awareness and sufficient information, small farms may not obtain the tools or training necessary to adopt better practices. and most of the identifiable factors that influence farmers' willingness to adopt conservation practices are not very helpful for initiating change (Pheesphan, Shivakoti, & Soni, 2019).

The results of a study indicate that there is no correlation between the adoption of good agricultural practices by the farmer surveyed and the independent variables studied, namely: age, level of education, size of agricultural tenure, number of family members, membership in social organizations, and degree of membership in social organizations, and the results also reported that there is a direct correlation between the respondents' adoption of good agricultural practices and each of: the level of education, the size of agricultural tenure, membership in social organizations, and the degree of membership in social organizations at a significant level of 0. 05, and between adoption and the size of agricultural tenure at a level of 0.01, and the results indicated a significant relationship reversible between the respondents' adoption of good agricultural practices and age at a level of 0.01. (Abd Elsalam & Elnagar, 2021).

Good agricultural practices are the best method due to the high production and economic efficiency of agricultural practices applied in the production of potato and beets crops using simple indicators and using measures to assess economic efficiency, showing that the productivity of the two crops increased when using good agricultural practices more than using traditional agricultural practices. While the total costs were low for the use of traditional agriculture in the cultivation of the potato crop compared to the use of good agricultural practices in agriculture, due to the high prices of imported seeds used in the cultivation of potatoes and beets, as well as machines used in harvesting, organic fertilizers and biopesticides, and by calculating the net return from agriculture, the use of good agricultural practices was higher than the use of traditional agriculture (Ibrahim, 2018).

The Agricultural Extension System is one of the informal educational systems that aims to transfer technologies to rural people and teach them how to exploit their potential and

self-efforts to raise their economic and social level by making desirable changes in their knowledge, skills and attitudes, through the adoption of agricultural practices in general and good agricultural practices in particular to achieve significant gains in productivity and income, and increase the ability of their agricultural activities to face emergency conditions and solve the problems facing them, The adoption process is influenced by many factors such as individuals' behavior, interaction and coordination, as well as teamwork and farmers' ability to identify alternatives, challenges, information, knowledge and conservation of natural and human resources (Abd Elsalam & Elnagar, 2021).

1.2.8 The impact of demographic variables on the application of good agricultural practices

The results of a study of a sample from Assiut Governorate indicate that three quarters of the respondents (74.0%) are in the age group of 40 to 60 years, and that 38% of them are illiterate, and the results indicated that 44% of the respondents have agricultural holdings of more than 5 acres, so it is not surprising that 67% of them work in agriculture as a basic profession, and that 75% of family members also work in the field of agriculture. As for membership in social organizations, the majority (87%) indicated that they are not members of any social organization. The results of a study show the importance of independent variables, namely age, level of education, size of agricultural holding, number of family members, membership in social organizations, and degree of membership in social organizations" in the process of predicting the adoption of good agricultural practices, where it can be said that young people and farmers with large agricultural holdings, those with the highest level of education and members of social organizations are more likely to adopt good agricultural practices in Assiut Governorate. (Abd Elsalam & Elnagar, 2021)

In a study finding suggest that smaller and non-traditional farmers might be a prime audience for increased outreach because they lack the specialized equipment and management skills, and validation of Good Agricultural Practices (GAP) Vegetable Farms, the study had been based on the FDA GAP audit and included nine sections covering worker health and hygiene, harvesting, transportation, packaging, use of municipal manure, irrigation, and wastewater treatment. (Prokopy et al., 2014).

The study shows that young farmers, owners of large agricultural holdings, those with higher education, and members of social organizations were more likely to adopt good agricultural practices in Assiut Governorate. (Abd Elsalam & Elnagar, 2021).

Where the similarity was in the questions related to the farm, for example, "the size of the farm, the number of employees and market outlets", but they differed significantly through the percentage of organic and non-organic farms versus the traditional farms, as the study recommends a Caution when comparing farms by region or through organic production methods versus traditional production methods, because some concepts may differ from one region to another (Hamilton, et al., 2015).

1.2.9 The impact of the implementation of the GAP program on the health and well-being of workers

They also reported that there were bad practices, especially in the hygiene of used utensils and tools, lack of observance of hygiene and workers' hygiene, water testing, and keeping farm records (Prokopy et al., 2014).

The results of a study indicate that there were bad practices, especially in the hygiene of used utensils and tools, lack of observance of hygiene and workers' hygiene, water testing, and keeping farm records, and the use of an approach in a study of the postal survey system to verify the validity of the study or the use of observation and personal interviews. The results were similar in both systems, where the questions were a checklist with the answer yes or no. (Hamilton et al., 2015)

1.3 Problem statement

The decline in land holdings and the intensive use of the agricultural production system in Palestine has led to a significant increase in the use of agrochemicals (Palestinian Central Bureau of Statistics, 2021). This has caused severe damage to the environment and public health. The transition to a safe agricultural system will need to explore possibilities along the agri-food value chain. Decisions must be made by a wide range of partners and actors within the value chain, starting from producers, stakeholders, traders, and final consumers.

1.4 Main study questions

What practices and behaviors are practiced by the farmer on the farm?

What is the farmer's degree of awareness regarding the Palestinian Pal Gap Certificate?

1. Is the agricultural practices and activities implemented by farmers at the farm level differ according to demographic and socioeconomic variables such as gender, age, educational qualification, place of residence, monthly household income, and number of family members?
2. Is the degree of farmer awareness of the Palestinian PAL GAP differ according to demographic and socioeconomic variables (gender, age, education, place of residence, monthly household income, and the number of family members)?
3. Is the practices and behaviors practiced by the farmer at the farm level differ according to the variables such as: obtaining the PAL GAP certification, farm size, type of agriculture, crops grown, productivity, number of workers, members of social organization, membership in the social organization ?
4. Is the degree of awareness of the farmer regarding the Palestinian PAL.GAP certificate differ according to the variables such as: obtaining the PAL.GAP certification, farm size, type of agriculture, crops grown, productivity, number of workers, members of social organization, degree of the membership in the social organization)?

1.5 Research hypotheses

1. H1: There are no statistically significant differences at the level of significance ($\alpha = 0.05$) in the practices applied by farmers and the behaviors practiced by the farmer on the farm according to the variables gender, age, education, place of residence, monthly household income, number of family members
2. H2: There are no statistically significant differences at the significance level ($\alpha = 0.05$) in the degree of farmer awareness of the Palestinian PAL GAP certificate, according to the variables (gender, age, education, place of residence, monthly household income, number of family members).
3. H3: There are no statistically significant differences at the level of significance ($\alpha = 0.05$) in the practices and behaviors practiced by the farmer on the farm according to the variables obtained the PAL GAP certification, farm size, type of agriculture, crops grown, productivity, number of workers, members of social organization, degree of the membership in the social organization).

4. H4: There are no statistically significant differences at the level of significance (α = 0.05) in the degree of farmer's awareness of the Palestinian PAL GAP Certificate according to the variables (obtaining the PALGAP certification, farm size, type of agriculture, crops grown, productivity, number of workers, members of social organization, degree of the membership in the social organization).
5. H5: There is no statistically significant relationship at the level of significance (α = 0.05) between the practices and behaviors practiced by the farmer on the farm and the degree of thefarmer's awareness of the Palestinian PAL GAP certificate.
6. H6: There is no statistically significant relationship at the level of significance (α = 0.05) between the practices and behaviors practiced by the farmer on the farm and the land- holding size.
7. H7: There is no statistically significant relationship at the level of significance (α = 0.05). between the agricultural practices and activities implemented by farmers at the farm level and the amount of subsidy and support available .

1.6 Importance of the study

Agriculture in Palestine is considered an essential part and component of the Palestinian national, cultural, economic, and social life. This sector is vital in creating seasonal job opportunities, raising income, and achieving food security for many Palestinian families (Palestinian Central Bureau of Statistics, 2021). The security and food safety that is rolling locally considered the most important subject which concern all concerned parties and the participant in all the value chain to product different agriculture, which has led to encouraging all of these parties to continue striving to provide and work to ensure its safety in all stages of its production, starting from the producer (farmer) and reaching the market and ending with the consumer Through the adoption of specialized modern programs to ensure the safety and security of agricultural and food products from any chemical residues or any other pollutants which is unrecognized and permitted locally and internationally, and to ensure obtaining a higher level of quality for agricultural and food products and that these products have been produced in environmentally friendly manner, taking into consideration working conditions for workers in the farm or facility, and the response of consumer demand and their right to obtain a safe product.

1.7 The study objectives

The Palestinian government seeks to direct agricultural production systems towards sustainable and environmentally safe agriculture to contribute in improving the farmer's

income. Guiding Palestinian farmers to produce healthy and safe crops and connect them to new markets through preparing and developing a specification for good agricultural practices to help and work to achieve the goals of the Palestinian PAL GAP. The adoption of good and economically feasible agricultural practices promotes the reduction of agricultural chemical inputs locally and develops good agricultural practices while ensuring the application of a complete and comprehensive system of crops from the farmer to the consumer. By providing a guide that provides basic and practical information to the farmer about the best good agricultural practices that farmer must follow according to the work environment and Palestinian agriculture.

A survey conducted by selecting a representative a vailable sample of 291 agricultural holders in the governorates of Tulkarem and Nablus. It will consist of questions that achieve the study's objective, collect and analyze data and discuss the results to determine the study's outputs and the recommendations which contribute to identifying the farmer's attributes and other factors influencing the adoption of the PAL GAP certification.

1.9 Therefore the Specific objectives are

1. Investigate and analyze farmers' awareness, knowledge, attitudes, and preferences toward adopting agro - PAL GAP – certified agricultural products.
2. Analyze the impact of farmers' socio-economic factors on adopting agro-PAL GAP-certified agricultural products, highlighting specific needs and measures to reinforce the farmers' adoption of PAL GAP.
3. Identify the good agricultural practices carried out by the farmer on his farm and compare them with the practices of the PAL GAP system.
4. Wellness of farmers to adopt PALGAP–certified agriculture products certificates.

1.10 Study Boundaries

The study was limited to the following boundaries:

Human boundaries: Vegetable farmers in the northern West Bank (Nablus, Tulkarem, Jenin).

Subjective boundaries: The study addressed (knowledge, interest, evaluation, practice, adoption).

Temporal boundaries: The study was conducted during the academic year 2024-2025.

Spatial boundaries: The study was conducted in the northern West Bank in the provinces of Nablus, Tulkarem, and Jenin.

Chapter Two

Materials and Methods

2.1 Methodology

The researcher followed the descriptive, correlational approach. The questionnaire was be used as a data collection tool to investigate several variables such as socio-demographic, market and economic characteristics, perception, knowledge, trust, and awareness factors that influence farmers to adopt agricultural products certified by PALGAP. Unlike experimental research, the researcher will not control or manipulate any variables but only observe and measure them.

2.2 Study population

The study population consists of all vegetable farmers in Tulkarem, Nablus and Jineen governments. The total number of farmers is (1583) in Tulkarem, (712) in Nablus, and (2341) in Jenin, in total including a group of (4,636) farmers, according to the Palestinian Central Bureau of Statistics (2021).

2.3 The study sample

The study sample consisted of (291) agricultural holder saccording to Thampson quotation, representing (6.3%) of the study community, which was selected by the available method as a representative sample of the study community through the application of study tools. In the research paper, (Gay, Mills, & Airasian, 2012), and Table (1) shows the distribution of the study sample.

Thampson quotation:

$$n=\frac{N\times p(1-p)}{\left[\left[N-1\times\left(d^2\div z^2\right)\right]+p(1-p)\right]} \quad \text{..} \quad 1$$

n. sample size

N. number of population

z. degree of stander in α=0.05,equele 1.96

d. eerors percentage α=0.05

p. The availability rate of the neutral feature =0.50

Table 1

Distribution of the study sample

Vari	cat	Fre	%	Vari	cat	Fre	%
Governorate	Nablus	117	40.2	Number of family members currently working	0-2	186	64.8
	Tulkarm	100	34.4		3-5	85	29.6
	Jenin	74	25.4		6-8	16	5.6
Gender	Male	259	89.0	Support	No	200	69.0
	Female	32	11.0		Yes	9	31.0
age	18-24y	11	3.8	Nature of agricultural holding:	owner	193	66.3
	25-29 y	28	9.6		Rented	41	14.1
	30-39 y	77	26.5		guarantee	45	15.5
	40-49 y	93	32.0		parental	12	4.1
	50-59 y	62	21.3	Type of holding	plants	269	92.4
	60 or more	20	6.9		Mixed	22	7.6
marital status	bachelor	38	13.1	Total cultivated land area	0-2	88	30.2
	married	249	85.6		3-4	91	31.3
	others	4	1.4		5-10	75	25.8
Number of family members	1-3	65	22.3		More 10	37	12.7
	4-5	112	38.5	Total cultivated land area (irrigated)	0-2	104	35.9
	6-8	107	36.8		3-4	88	30.3
	9 or more	7	2.4		5-10	71	24.5
Place of residence	city	17	5.8		More 10	27	9.3
	village	274	94.2	Cultivated land area (the exposed irrigated)	0-2	230	79.0
Academic qualificatio	Secondary	144	49.5		3-4	25	8.6
	diploma	53	18.2		5-10	19	6.5
	Bachelor	81	27.8		More 10	17	5.8
	Postgraduate	13	4.5	Cultivated land area (irrigated in greenhouses)	0-less 0.5	64	22.0
Income level	Less 2000	62	21.3		0.5-1	51	17.5
	2000-4000	156	53.6		More1-3	100	34.4
	More 4000	73	25.1		More3	76	26.1
His relationship with family suppor	Main	231	79.4	Production quantity per dunum in the agricultural year (seeds or fruits) in tons	0-less 0.5	247	84.9
	One of the	56	19.2		0.5-1	20	6.9
	Other	4	1.4		More1	24	8.2
Nature of work on the farm	Total	200	68.7	Did you get your pal gap certificate	No	261	89.7
	Part time	91	31.3		Yes	30	10.3
Membership status in social institutions	Board Member	25	8.6				
	Regular Member	96	33.0				
	Not subscribed	170	58.4				

2.4 Survey design

To achieve the objectives of the study, a questionnaire was developed that includes the respondent's demographic variables and others related to agricultural holdings, the use of a measure practices and behaviors that the farmer practices on the farm, the extent of the practices and behaviors that the farmer practices on the farm., and farmers' awareness of the Palestinian PAL GAP certificate.

1. Demographic variables of the respondent: (location (governorate), gender, age, marital status, number of family members, Place of residence, educational qualification, income level, his relationship with family support, nature of work on the farm, membership status in social organization, number of family members currently working, support, nature of agricultural holding, type of holding, total cultivated land area, total cultivated land area (irrigated), cultivated land area (the open field irrigated), protected cultivated land area (irrigated in greenhouses), irrigated cultivated land area in low tunnels, granted the PAL-GAP certificate.
2. The study scale measures the practices and behaviors that the farmer practices on the farm, and the extent of the practices and behaviors that the farmer practices on the farm. Farmers' awareness of the Palestinian PAL GAP certificate, which consists of the following:

A. The field of knowledge of the concept for PAL-GAP, which consists of (17) items, where the answers to it were yes (1) and no (0).
B. The field of interest of the concept for PAL-GAP, which consists of (10) items, where the answers to it were Strongly agree (5), agree (4), neutral (3), disagree (2), strongly disagree (1).
C. The field of farmers' evaluation of good agricultural practices for PAL-GAP, which consists of (7) items, where the answers to it were Strongly agree (5), agree (4), neutral (3), disagree (2), strongly disagree (1).
D. The field of common practices for record keeping and internal self- inspection on the farm, which consists of (10) items, where the answers to it were yes (1) and no (0).
E. The field of good agricultural practices that the farmer does in the farm, which consists of (28) items distributed into (5) fields, where the answers to it were yes (1) and no (0), Plant quality and health consists of (5) items, Soil management and protection consists of (4) items, Fertilizer management consists of (5) items, Water management consists of (6) items, and Integrated pest management consists of (8) items.
F. The field of Health Safety and luxury of Workers: (Risk Assessment), which consists of (10) items, where the answers to it were yes (1) and no (0).
G. The field of Pollutant and waste management and environmental protection, which consists of (12) items, where the answers to it were yes (1) and no (0).
H. The field of Measuring extent of adoption for the pal Gap, which consists of (7) items, where the answers to it were yes (1) and no (0).

2.5 Questionnaire Validation

The following validation and reliability checks were applied to ensure the accuracy and consistency of the questionnaire tool. A pilot survey was conducted, applying the study tool to a survey sample of (30) respondents, with the aim of verifying its clarity, structure, consistency and validity. The results of the pilot study helped in modifying the study tool.

2.5.1 Content Validity

The questionnaire was sent to three local experts to evaluate and judge it according to the study objectives.

2.5.2 Pre-testing the questionnaire

A preliminary study (pilot survey) was conducted on a test sample to ensure the questions were clear and to avoid lengthy and ambiguous questions. The pilot study included (30) participants from different age groups, gender, educational levels and places of residence.

2.6 Questionnaire Reliability

Reliability refers to the degree of consistency with which a measurement instrument yields stable and repeatable results. It indicates the extent to which the tool produces similar outcomes under consistent conditions. To assess the reliability of the research instruments, the Cronbach's alpha coefficient was calculated using the SPSS software. A reliability coefficient of 0.70 or higher is generally considered acceptable, indicating satisfactory internal consistency of the measurement tool. The analysis results indicated that the indicators of structural validity and reliability of the study tool were achieved.

2.7 Data Collection, entry, and management

The researcher collected data in the study year (2024-2025) through the paper application of the study tool (questionnaire), by conducting field interviews with farmers face to face. The interview was conducted by giving participants full instructions and explanations about the study, its objectives and the importance of providing reliable answers. The interview was also conducted at the appropriate time for the farmers, taking into account all ethical considerations.

After collecting the data, it was entered into the program, and then the appropriate statistical analyses were conducted to extract the results to answer the study questions and hypotheses.

2.8 Statistical analysis methods

The Statistical Package for the Social Sciences (SPSS - version (2022) program was used to enter the sample members' responses to the study tools, and the data was processed and analyzed to answer the study questions, as follows:

1. Extracting frequencies and percentages to describe the study sample members according to their demographic characteristics.
2. Using Pearson's correlation coefficient between the score on the paragraph and the total score on the scale to verify the construct validity of the study tools.
3. Using Cronbach's alpha equation to verify the stability of the internal consistency of the study tools.
4. Extracting averages and standard deviations to answer the study questions one - eight.
5. Using two t-tests for two independent samples and a one-way analysis of variance test to answer the study questions nine - eighteen.

Chapter Three

Results

3.1 Reliability Tests for Questionnaires

To ensure the internal consistency and reliability of the research instrument, a reliability analysis was conducted using Cronbach's Alpha (α). The reliability test was performed using SPSS software (see table 2).

Measures internal consistency, results of Cronbach's Alpha (α):

Table 2

Results of Cronbach's Alpha (α)

variable	Number of items	Cronbach's Alpha
knowledge of the concept of PAL-GAP	17	0.868
interest of the concept of PAL-GAP	10	0.880
farmers' evaluation of good agricultural practices of PAL-GAP	7	0.942
common practices for record keeping and internal self- inspection on the farm	10	0.934
Plant quality and health	5	0.773
Soil management and protection	4	0.777
Fertilizer management	5	0.802
Water management	6	0.870
Integrated pest management	8	0.847
good agricultural practices that the farmer does in the farm	28	0.951
Health, Safety and luxury of Workers: (Risk Assessment)	10	0.876
pollutant and waste management and environmental protection	12	0.939
Measuring extent of adoption of the pal Gap	7	0.718

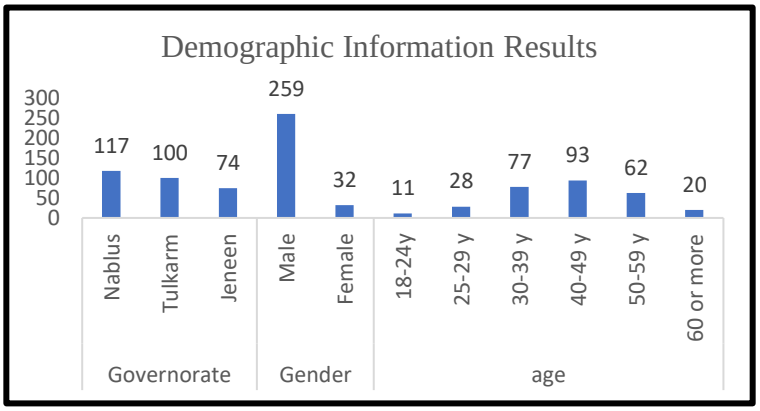
Notice from the above table that Cronbach's alpha value for the scope (knowledge of the concept of PAL-GAP) reached (0.868), the Cronbach's alpha value for the scope (interest of the concept of PAL-GAP) reached (0.880), the Cronbach's alpha value for the scope (farmers' evaluation of good agricultural practices of PAL-GAP) reached (0.942), the

Cronbach's alpha value for the scope (farmers' evaluation of good agricultural practices of PAL-GAP) reached (0.942), the Cronbach's alpha value for the scope (common practices for record keeping and internal self- inspection on the farm) reached (0.934), the Cronbach's alpha value for the scope (Plant quality and health) reached (0.773), the Cronbach's alpha value for the scope (Soil management and protection) reached (0.777), the Cronbach's alpha value for the scope (Fertilizer management) reached (0.847), the Cronbach's alpha value for the scope (good agricultural practices that the farmer does in the farm) reached (0.951), the Cronbach's alpha value for the scope (Health, Safety and luxury of Workers: (Risk Assessment)) reached (0.876), the Cronbach's alpha value for the scope (pollutant and waste management and environmental protection) reached (0.939),and the Cronbach's alpha value for the scope (Measuring extent of adoption of the pal Gap reached (0.718), It is observed through the values of Cronbach's alpha reliability coefficient that they are good and indicate the validity of the questionnaire for measuring the studied changes.

3.2 Demographic Information Results

Figure 1

Demographic Distribution of Respondents by Governorate, Gender, and Age Group



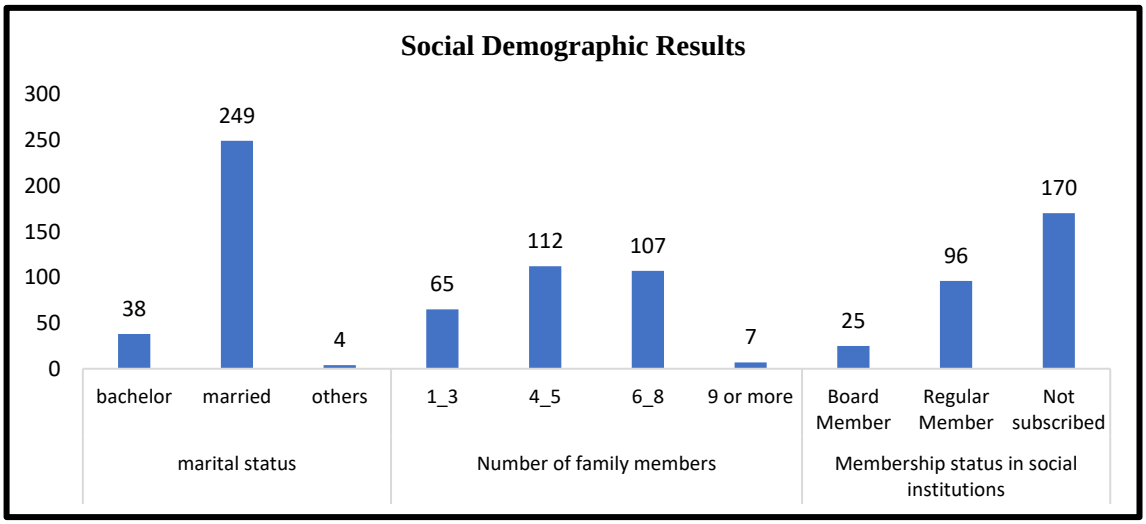
Notice from the above figure that the sample for Nablus government was reached (117) farmers, the sample for Tulkarm government was reached (100) farmers and the sample for Jenin government was reached (74) farmers. On the other hand, the sample content (259) male and (32) female. otherwise, the sample content different ages as follow from (18-24) reached (11) farmers, from (25-29) reached (28)farmers ,from (30-39)reached

(77) farmers, from (40-49) reached (93) farmers, from (50-59)reached (62) farmers, and more than (60)reached (20) farmers.

3.3 Social Demographic Results

Figure 2

Social Demographic

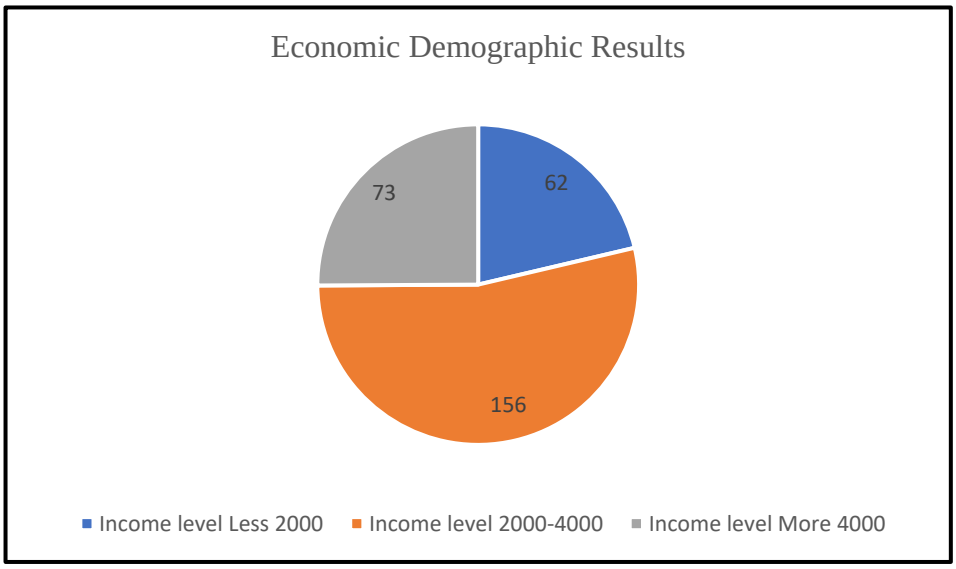


Notice from the above figure that the sample for marital status was reached (38) bachelor, (294) married and (4) others. On the other hand, the sample content different number of family members as follow from (1-3) reached (65) farmers, from (4-5) reached (112) farmers, from 6-8) reached (107) farmers, and more than (9) reached (7) farmers. Otherwise, the sample content the difference of the membership status in social institution as follow (25) farmers found board member,(96) farmer found regular member , and (170) found not subscribed.

3.4 Economic Demographic Results

Figure 3

Economic Demographic



Notice from the above figure that the sample content (62) farmers have income level less than 2000 nis, (156) farmers have income level between (2000-4000) nis, and (73) farmers have income level more than (4000) nis.

3.5 Farmers' Knowledge of PAL-GAP in Northern Palestine

To determine the level of knowledge of the concept of PAL-GAP, the means, standard deviations, and level of knowledge of the concept of PAL-GAP were calculated among a sample of farmers in northern Palestine at the overall level and section D contain from (D1 to D18), as shown in Table (3). The results reveal that farmers in the northern governorates of Palestine exhibit a generally high level of perceived knowledge and awareness regarding the benefits of PAL-GAP. The highest-ranked indicator was the perceived impact of PAL-GAP on the quality of Palestinian agricultural products (M = 0.90, SD = 0.30), followed by the impact on profitability (M = 0.89, SD = 0.31) and improvement of soil properties (M = 0.88, SD = 0.33). These findings suggest strong recognition among farmers of the potential value PAL-GAP offers in terms of product quality, environmental benefits, and economic returns. Farmers also demonstrated awareness of the marketing advantages (M = 0.87) and expressed interest in obtaining certification (M = 0.87), alongside acknowledgment of the need for training (M = 0.84). However, while the perception of the benefits is high, the actual awareness of the

certification procedures and adoption remains limited. Only 70.1% of farmers had heard of PAL-GAP, and 59.8% knew what the certificate required. Knowledge of requirements and financial readiness was lower still, with only 54.6% and 53.6%, respectively, responding positively. Most notably, only 10.3% of respondents had obtained the PAL-GAP certificate, indicating a significant gap between perceived value and actual adoption. Despite the high overall mean score of 0.71 for the knowledge dimension, the data reflect a need for targeted interventions to enhance procedural knowledge and practical training for farmers about PAL-GAP.

Table 3

Frequencies, percentages, averages, deviations, ranks, and level of knowledge of the concept of PAL-GAP among a sample of farmers in northern Palestine at the overall level and items

Num	Knowledge Indicators	Response				M	SD	Rank	Degree
		Yes		No					
		Fre	%	Fre	%				
D16	Perceived impact of PAL-GAP on the quality of Palestinian agricultural products by farmers.	263	90.4	28	9.6	0.90	0.30	1	high
D17	Impact of PAL-GAP on profitability	260	89.3	31	10.7	0.89	0.31	2	high
D15	Role of PAL-GAP in improving soil properties	255	87.6	36	12.4	0.88	0.33	3	high
D13	Impact of the PAL-GAP certificate on accessing new marketing opportunities	253	86.9	38	13.1	0.87	0.34	4	high
D8	Interest in obtaining a PAL-GAP certificate	252	86.6	39	13.4	0.87	0.34	5	high
D9	Need for training to enhance knowledge for obtaining the PAL-GAP certificate	244	83.8	47	16.2	0.84	0.37	6	high
D14	Perceived effect of obtaining a PAL-GAP certificate on reducing long-term production costs	234	80.4	57	19.6	0.80	0.40	7	high
D18	Obtaining a pal Gap certificate is compulsory for exporting to local and regional markets	218	74.9	73	25.1	0.75	0.43	8	high
D3	Hearing about pal gap certification	204	70.1	87	29.9	0.70	0.46	9	high
D1	Hearing about Glo PAL-GAP certification	198	68.0	93	32.0	0.68	0.47	10	high
D2	Hearing about safe agricultural production	194	66.7	97	33.3	0.67	0.47	11	middle
D4	The difference between good agricultural practices (GAP) and safe agricultural practices	192	66.0	99	34.0	0.66	0.47	12	middle
D6	Knowing what a pal gap certificate is	174	59.8	117	40.2	0.60	0.49	13	middle
D7	knowing the conditions and requirements for obtaining a pal Gap certificate	159	54.6	132	45.4	0.55	0.50	14	middle
D10	Having the financial ability to obtain a pal Gap certificate	156	53.6	135	46.4	0.54	0.50	15	middle
D11	Obtain your pal gap certificate	30	10.3	261	89.7	0.10	0.30	16	low
overall level of knowledge of the concept of PAL-GAP						0.71	0.24		high
0-0.33 low, above 0.33-0.67 middle, above 0.67-1 high									

3.6 Interest in the PAL-GAP Concept Among Farmers in Northern Palestine

To determine the level of interest of the concept of PAL-GAP, the means, standard deviations, and level of interest of the concept of PAL-GAP were calculated among a sample of farmers in northern Palestine at the overall level and section E contain from (E1 to E10), as shown in Table (4) below. The results indicated a high level of interest among farmers in Northern Palestine regarding the concept of Palestinian Good Agricultural Practices (PAL-GAP), with an overall mean score of 3.95 and a standard deviation of 0.59. This reflects respondents' strong willingness to learn about, understand, and potentially adopt PAL-GAP standards.

The highest-rated statement was E9, "Interest in a training opportunity to increase your knowledge in the PAL-GAP system," which achieved a mean of 4.16 and a standard deviation of 0.83. This highlights a strong demand for structured training programs to build farmers' capacity for PAL-GAP implementation.

Closely following was the indicator E10, which states, "Believing that the level of consumer awareness of obtaining a safe agricultural product may increase your interest in obtaining the PAL-GAP certificate," with a mean score of 4.15. This suggests that farmers are motivated by consumer preferences and perceive added value in certification as a response to market demands.

Statements E4, E8, and E7, covering food security, the need for theoretical training, and the long-term cost-reduction potential of PAL-GAP, also scored highly (means of 4.08, 4.07, and 3.93 respectively), reinforcing that farmers see the certification not just as a regulatory need but as a tool for improving production and sustainability.

Interestingly, even the relatively lower-rated statements—E6 and E5, both addressing the perceived costliness of applying for certification—received mean scores of 3.80 and 3.69, which still fall within the "high" interest category. This indicates that although farmers acknowledge potential financial barriers, it does not significantly diminish their overall interest in the PAL-GAP system.

These findings demonstrate that farmers are not only aware of the value of PAL-GAP but also willing to engage with it, particularly if supported with training and market incentives. The data highlights an opportunity for agricultural development programs and

policymakers to expand outreach, subsidize certification costs, and provide technical training as part of a broader strategy to enhance the adoption of sustainable agricultural practices in Palestine.

Table 4

Frequencies, percentages, averages, deviations, ranks, and level of interest of the concept of PAL-GAP among a sample of farmers in northern Palestine at the overall level and items

Num	Indicator	M	SD	Rank	Degree
E9	Interest in a training opportunity to increase your knowledge in the pal Gap system	4.16	0.83	1	high
E10	believing that the level of consumer awareness of obtaining a safe agricultural product may increase your interest in obtaining the pal Gap certificate	4.15	0.82	2	high
E4	Using pal Gap can help increase food security	4.08	0.79	3	high
E8	Need theoretical training to increase your knowledge in the pal Gap system	4.07	0.85	4	high
E7	Obtaining a pal Gap certificate reduce production costs in the long run	3.93	0.87	5	high
E1	Knowing the Palestinian good agricultural practices pal gap	3.91	0.89	6	high
E2	Distinguishing between good agricultural practices pal gap and traditional agricultural practices	3.91	0.88	7	high
E3	Distinguishing between good agricultural practices pal gap and safe agricultural practices	3.82	0.90	8	high
E6	Applying for the pal Gap Certificate can be expensive	3.80	0.83	9	high
E5	Applying for the pal Gap Certificate can be expensive	3.69	0.89	10	high
	overall level of interest of the concept of PAL-GAP	3.95	0.59		high
	1-2.33 low, above 2.33-3.67 middle, above 3.67-5 high				

3.7 Evaluation of good agricultural practices of Pal GAP among farmers in the studied area of the northern West Bank – Palestine.

To determine the level of farmers' evaluation of good agricultural practices of Pal GAP, the means, standard deviations, and level of farmers' evaluation of good agricultural practices of PAL-GAP were calculated among a sample of farmers in northern Palestine at the overall level and indicator level and section F contain from (F1 to F7), that findings in Table (5) indicated that farmers in Northern Palestine highly evaluate the Good Agricultural Practices (PAL-GAP) promoted under the PAL-GAP system. The

overall mean score was 4.10 with a standard deviation of 0.61, placing the evaluation level firmly within the "high" category. This reflects a strong recognition among farmers for the technical and environmental benefits of applying PAL-GAP principles in agricultural production.

The highest-ranked indicator was F6, “Using the PAL-GAP system can further improve the quality of agricultural products and food safety,” with a mean of 4.17 and a standard deviation of 0.70. This indicates farmers' recognition of the certification’s role in improving both their produce's market value and safety.

This was followed by F1 and F2, relating to the efficient use of natural resources, specifically water (M = 4.15) and soil (M = 4.10), indicating a high level of environmental awareness. These findings are especially relevant given the increasing concern over resource scarcity and the need for sustainable production methods in Palestine.

Indicators such as F5 and F3, which focused on reducing chemical inputs and enhancing the use of organic fertilizers, both scored 4.09, further supporting the perception that PAL-GAP contributes to safer and more sustainable agricultural practices.

The lowest-ranked indicators, F7 (increased crop productivity, M = 4.06) and F4 (efficiency of integrated pest management, M = 4.05), still fall within the high evaluation range. This suggests that while yield benefits are acknowledged, farmers may place slightly more emphasis on quality, safety, and environmental outcomes than on productivity alone.

These results show that farmers are not only interested in PAL-GAP but also clearly value the practical outcomes associated with its implementation, particularly in terms of food safety, environmental sustainability, and resource efficiency. These perceptions provide a strong foundation for encouraging wider adoption through training, extension services, and incentive programs.

Table 5

Frequencies, percentages, averages, deviations, ranks, and farmers' evaluation of good agricultural practices of PAL-GAP among a sample of farmers in northern Palestine at the overall level and items

Num	Indicators	M	SD	Rank	Degree
F6	Using of the pal Gap system can further improve the quality of agricultural products and food safety	4.17	0.70	1	high
F1	Using the pal Gap system can increase the efficiency of using natural resources such as water	4.15	0.67	2	high
F2	Using the pal gap system can increase the efficiency of using natural resources such as soil.	4.10	0.72	3	high
F5	Using the pal Gap system can reduce the use of pesticides, fungicides and agricultural chemicals	4.09	0.70	4	high
F3	Using the pal Gap system can increase the efficiency of using organic fertilizers	4.09	0.69	5	high
F7	Using the pal Gap system can increase crop productivity	4.06	0.76	6	high
F4	Using the pal Gap system can increase the efficiency of use Integrated pest management system	4.05	0.72	7	high
overall level of farmers' evaluation of good agricultural practices of PAL-GAP		4.10	0.61		high

1-2.33 low, above 2.33-3.67 middle, above 3.67-5 high

3.8 Common practices for record keeping and internal self-inspection on the farm among a sample of farmers in northern Palestine?

To determine the common practices for record keeping and internal self- inspection on the farm, the means, standard deviations, and the common practices for record keeping and internal self- inspection on the farm were analyzedamong a sample of farmers in northern Palestine at the overall level and indicator level and section H contain from (H1 to H9), that show in table (6)below.

Table 6

Frequencies, percentages, averages, deviations, ranks, and the common practices for record keeping and internal self- inspection on the farm among a sample of farmers in northern Palestine at the overall level and items

Num	Indicators	Response Yes Fre	%	No Fre	%	M	SD	Rank	Degree
H1	Keeping agricultural records	193	66.3	98	33.7	0.66	0.46	1	middle
H2	Records include production quantity	192	66.0	99	34.0	0.66	0.47	2	middle
H4	Records include details of the sale of the resulting agricultural product, the quantities sold and their prices	191	65.6	100	34.4	0.66	0.48	3	middle
H8	Farm planning of production sites considers the health of workers? Environment, food safety, animal health	187	64.3	104	35.7	0.64	0.48	4	middle
H3	Records include purchase orders (invoices) for the purchase of materials for product ion inputs	173	59.5	118	40.5	0.59	0.49	5	middle
H9	Having an action plan that outlines strategies to reduce risks from water pollution or other pollutants	162	55.7	129	44.3	0.56	0.50	6	middle
H10	Having effective system in place to identify and separate all PAL-GAP certified and non-GAP certified products. Parallel production.	157	54.0	134	46.0	0.54	0.50	7	middle
H5	Records show the names of the workers on the farm and the tasks they perform	147	50.5	144	49.5	0.51	0.50	8	middle
H7	Having a special recording system been established for each production unit	145	49.8	146	50.2	0.50	0.50	9	middle
H6	Records demonstrate the experience, skill competence and training of employees	133	45.7	158	54.3	0.46	0.50	10	middle
overall level of common practices for record keeping and internal self-inspection on the farm						0.58	0.39	middle	
0-0.33 low, above 0.33-0.67 middle, above 0.67-1 high									

The findings presented in Table (6) reveal a moderate level of adoption of these practices among farmers in Northern Palestine, with an overall mean of 0.58 and a standard deviation of 0.39, placing the general performance in the "middle" category.

The most commonly adopted practice was H1: "Keeping agricultural records," reported by 66.3% of the respondents, with a mean of 0.66, ranking it first. Closely following were H2 ("Records include production quantity") and H4 ("Records include details of the sale of agricultural products"), both with means of 0.66 as well, indicating that basic production and sales tracking are somewhat practiced.

Other practices related to environmental and safety planning also received moderate attention. For example, H8 ("Farm planning considers health, environment, food safety, and animal health") had a mean of 0.64, suggesting a growing awareness of comprehensive planning, even if not fully institutionalized.

However, more advanced or detailed practices appear less common. For instance, only 45.7% of farmers-maintained records demonstrating the experience and training of employees (H6, mean = 0.46), while only 49.8% had separate recording systems for individual production units (H7, mean = 0.50). Furthermore, only 54.0% of farmers reported having a system to separate GAP-certified from non-GAP-certified products (H10, mean = 0.54), an important requirement for traceability and compliance.

These results indicate that while basic record-keeping practices exist, systematic and comprehensive record-keeping and internal self-inspection practices are still underdeveloped among many farmers. The moderate overall score suggests a need for increased training, capacity building, and institutional support to help farmers adopt more structured and effective farm management systems that align with PAL-GAP requirements

3.9 The good agricultural practices that the farmer does in the farm among a sample of farmers in northern Palestine

To determine the good agricultural practices that the farmer implemented on their farms, the means, standard deviations, and performance levels of the good agricultural practices that the farmer implemented in the farm were calculated among a sample of farmers in northern Palestine at the overall level and dimensions (I) that contain 5 section which it Plant quality and health (I 1-I 4) , Soil management and protection (I 5- I 8), Fertilizer management (I 9 – I 13), Water management (I 14-I 19) , Integrated pest management (I 20-I 27). as shown in Table (7) below.

Table 7

Frequencies, percentages, averages, deviations, ranks, and the good agricultural practices that the farmer does in the farm among a sample of farmers in northern Palestine at the overall level and dimensions

Num	Indicators and agricultural practices	M	SD	Rank	Degree
5	Integrated pest management	0.68	0.31	1	high
3	Fertilizer management	0.64	0.35	2	middle
1	Plant quality and health	0.61	0.35	3	middle
2	Soil management and protection	0.61	0.37	4	middle
4	Water management	0.47	0.38	5	middle
overall level the good agricultural practices that the farmer does in the farm		0.61	0.31	middle	
0-0.33 low, 0.34-0.67 middle, 0.68-1 high					

The data in Table (7) indicated that the overall level of good agricultural practices among the surveyed farmers in northern Palestine is at a middle level, with an average score of 0.61 (i.e., 61%) and a standard deviation of 0.31.

Among the five measured dimensions, only Integrated Pest Management was rated at a high level, with the highest mean score of 0.68. This suggests that farmers are relatively more committed to pest management strategies compared to other practice areas.

Fertilizer Management ranked second with a mean of 0.64, followed by Plant Quality and Health and Soil Management and Protection, both at 0.61, reflecting moderate levels of implementation.

Water Management was rated the lowest among the dimensions, with a mean of 0.47, indicating a comparatively weaker application of water-related best practices.

These findings highlight areas where extension services, training, and support programs may be needed—especially in improving water management and reinforcing soil health practices—to raise the overall standard of good agricultural practices and align with sustainable development goals.

Good agricultural practices Indicator-level Analysis that belong to regarding the good agricultural practices implemented on farms which contain section (I) from (I1-I24),

means, standard deviations, and performance levels were calculated for each indicator across several practice areas among a sample of farmers in northern Palestine. The results are presented in appendix (B).

The agricultural practices implemented by farmers in northern Palestine, based on responses to a structured questionnaire. The practices were categorized into five thematic dimensions: Post-Harvest Handling and Quality Assurance, Soil Management and Protection, Fertilizer Management, Water Management, and Integrated Pest Management (IPM). The evaluation scale was defined as follows: scores from 0.00 to 0.33 indicated a low level of application, scores between 0.34 and 0.67 indicated a moderate level, and scores above 0.67 represented a high level of practice adoption.

Post-Harvest Handling and Quality Assurance

The results indicate a moderate overall level of adoption of post-harvest handling and quality assurance practices, with a mean score of 0.61 and a standard deviation of 0.35. Among the practices evaluated, owning a clean and hygienic storage facility for packaged products was the most highly adopted (M = 0.76), reflecting farmers' awareness of contamination risks. Moderate scores were also recorded for implementing preventive post-harvest measures (M = 0.66) and maintaining documentation related to crop varieties and seed sources (M = 0.62). However, practices related to separating traditional products from certified ones (M = 0.53) and maintaining a documented quality control system (M = 0.50) were less commonly applied, indicating a need to strengthen traceability systems and quality monitoring procedures at the farm level.

Soil Management and Protection

Soil management practices were also adopted at a moderate level (M = 0.61, SD = 0.37). The highest-rated item was the use of crop rotation to enhance soil properties (M = 0.68), which achieved a high adoption level. Other practices such as erosion prevention through mulching and planting trees (M = 0.66) and calculating crop nutrient needs based on soil analysis (M = 0.59) were moderately adopted. Notably, examining soil properties prior to planting scored the lowest in this category (M = 0.51), suggesting that proactive soil testing is not a widespread practice among farmers.

Fertilizer Management

The overall level of fertilizer management was moderate (M = 0.64, SD = 0.35), with some practices reaching high levels. Notably, storing fertilizers separately from pesticides to prevent contamination was the most widely adopted practice (M = 0.77), followed by farmer experience in using fertilizers (M = 0.73). While these findings suggest practical knowledge and awareness of safety, the relatively low scores for maintaining fertilizer usage records (M = 0.55) and updating fertilizer stock registers (M = 0.49) reflect a lack of systematic documentation and nutrient management planning.

Water Management

Water management was the least adopted practice, with an overall mean of 0.47 and a standard deviation of 0.38, indicating a moderate-to-low level of implementation. While farmers reported considering water pollution risks during irrigation or fertilization (M = 0.66), other practices were less common. For instance, keeping irrigation records (M = 0.54), conducting annual water testing (M = 0.46), and using certified laboratories for water analysis (M = 0.43) were moderately implemented. The lowest-scoring item across all categories was the use of treated wastewater for irrigation (M = 0.31), which fell into the low adoption range. These findings suggest a pressing need for interventions to promote water quality testing, documentation, and the safe reuse of water resources.

Integrated Pest Management (IPM)

Among all the agricultural practices, pest management had the highest adoption level, with an overall mean score of 0.68 and a standard deviation of 0.31. Farmers demonstrated a strong commitment to pesticide safety, with the highest-rated items being consideration of pre-harvest intervals (M = 0.87) and compliance with re-entry periods after spraying (M = 0.80). Additionally, practices such as consulting agricultural engineers and knowledge of approved pesticides were widely adopted. However, activities related to recording pest occurrence (M = 0.50) and documenting IPM-related actions (M = 0.61) were implemented at only moderate levels, indicating that while safety is emphasized, proactive and preventive pest monitoring systems are less developed.

The overall results highlight that while farmers in northern Palestine exhibit strong practices in pest management and certain areas of fertilizer and post-harvest hygiene, there are significant gaps in the application of water management and systematic

documentation. Practices grounded in traditional knowledge, such as crop rotation or pest control, are more widely adopted than those requiring institutional or scientific inputs like laboratory testing or formal recordkeeping.

These insights underscore the importance of strengthening agricultural extension services and capacity-building programs to support farmers in adopting more comprehensive and evidence-based PAL-GAP, particularly in areas such as water quality management, traceability, and documentation. Improving these practices will enhance farm sustainability, support food safety, and contribute to achieving relevant Sustainable Development Goals (SDGs) in the Palestinian agricultural sector.

3.10 Health, safety and welfare of workers: (Risk Assessment) among a sample of farmers in northern Palestine?"

To determine the level of Health, Safety and welfare of Workers: (Risk Assessment), the section (J) which contain from (J1-J10) , the means, standard deviations, and level of Health, Safety and welfare of Workers: (Risk Assessment) were calculated among a sample of farmers in northern Palestine at the overall level and related indicators levels, results were interpreted based on a three-point scale: low (0.00–0.33), moderate (0.34–0.67), and high (0.68–1.00). The findings are presented in Table (8).

Table 8

Frequencies, percentages, averages, deviations, ranks, and level of Health, Safety and luxury of Workers: (Risk Assessment) among a sample of farmers in northern Palestine at the overall level and items

Num	Indicators	Response				M	SD	Rang	Degree
		Yes		No					
		Fre	%	Fre	%				
J5	personal hygiene procedures and public health applied for farm workers?	209	71.8	82	28.2	0.72	0.45	1	high
J10	workers' accommodation on the farm suitable for living and do they have basic needs such as water, electricity, toilets,	192	66.0	99	34.0	0.66	0.47	2	middle
J3	first aid supplies and equipment available on the farm, and are they available for use by all workers	178	61.2	113	38.8	0.61	0.49	3	middle
J4	document and display instructions for personal hygiene and public health available on the farm	163	56.0	128	44.0	0.56	0.50	4	middle
J2	At least one person trained in first aid on the farm	160	55.0	131	45.0	0.55	0.50	5	middle
J1	Have workers received training in health safety (dealing with chemicals, disinfectants, pesticides, etc.)	149	51.2	142	48.8	0.51	0.50	6	middle
J8	Hazardous areas marked with warning signs and placed in appropriate locations	137	47.1	154	52.9	0.47	0.50	7	middle
J9	Regular meetings held between management and employees, and are these meetings documented in the records and discusses the health and safety of workers	117	40.2	174	59.8	0.40	0.49	8	middle
J6	Have any of your employees or family members been poisoned by pesticide spraying	73	25.1	218	74.9	0.25	0.43	9	low
J7	Have farm animals been exposed to poisoning and diseases due to spraying pesticides or pollutants	69	23.7	222	76.3	0.24	0.43	10	low
	overall level of Health, Safety and luxury of Workers: (Risk (Assessment					0.50	0.33	middle	

Note: 0-0.33 low, above 0.33-0.67 middle, above 0.67-1 high

The results aimed to evaluate the level of implementation of health, safety, and welfare practices for farmworkers in northern Palestine, with a focus on risk assessment. The assessment encompassed several dimensions, including personal hygiene, emergency preparedness, training on chemical hazards, exposure to toxic substances, and communication of safety procedures. The overall mean score for this dimension was 0.50 with a standard deviation of 0.33, reflecting a moderate level of implementation. This suggests that although many farms incorporate some aspects of worker health and safety, the practices remain fragmented and do not constitute a fully integrated risk management system.

Among the ten indicators assessed, the highest-rated practice was “personal hygiene procedures and public health measures applied for farm workers” (Item J5), which was implemented at a high level (M = 0.72, SD = 0.45). This finding indicates a broad recognition among farmers of the importance of maintaining hygiene standards for workers, likely driven by concerns for both worker health and product safety.

The second-highest score was recorded for “provision of suitable accommodation for workers, including access to basic services such as water, electricity, and toilets” (Item J10, M = 0.66, SD = 0.47). While this item fell within the moderate range, it signals a reasonable level of attention to worker welfare beyond the workplace.

Other moderately adopted practices included the availability of first aid supplies and equipment (Item J3, M = 0.61), the presence of at least one person trained in first aid (Item J2, M = 0.55), and the documentation and display of hygiene instructions on farms (Item J4, M = 0.56). These practices reflect an intermediate level of preparedness in terms of handling workplace injuries or promoting basic health guidelines.

However, the results revealed several areas of weakness. For instance, training for workers in dealing with chemicals, disinfectants, and pesticides (Item J1) was only modestly practiced (M = 0.51), indicating a lack of formal instruction regarding hazardous materials. Even more concerning were the low scores for marking hazardous areas with warning signs (Item J8, M = 0.47) and holding regular and documented health and safety meetings between farm management and workers (Item J9, M = 0.40). These findings highlight deficiencies in organizational safety structures and hazard communication.

The two lowest-scoring items fell into the low adoption category, both relating to the outcomes of poor chemical handling: “Have any employees or family members been poisoned by pesticide spraying?” (Item J6, M = 0.25, SD = 0.43), and “Have farm animals been exposed to poisoning or disease due to pesticide use or pollutants?” (Item J7, M = 0.24, SD = 0.43). While the low scores may reflect the limited occurrence of such incidents, they could also suggest underreporting or limited awareness of such health hazards.

The results indicated a moderate overall level of implementation of health and safety measures, with emphasis placed on basic hygiene and worker welfare. However, there are clear shortcomings in critical areas such as chemical safety training, hazard labeling, and structured communication between workers and management. These findings underscore the need for targeted interventions to improve farm-level occupational safety.

3.11 The Pollutant and waste management and environmental protection among a sample of farmers in northern Palestine

To determine the Pollutant and waste management and environmental protection, the section (K) which contain from (K1- K12) , the means, standard deviations, and level of the Pollutant and waste management and environmental protection were calculated among a sample of farmers in northern Palestine at the overall level and items, as indicated in Table (9).

Table 9

Frequencies, percentages, averages, deviations, ranks, and The Pollutant and waste management and environmental protection among a sample of farmers in northern Palestine at the overall level and items

Num	Indicators	Response				M	SD	Rank	Degree
		Yes		No					
		Fre	%	Fre	%				
K5	the farm and its surrounding areas clean of waste to prevent the provision of a place for the breeding of insects and diseases that affect food safety	210	72.2	81	27.8	0.72	0.45	1	high
K6	Owning specific places on the farm to store papers and waste	156	53.6	135	46.4	0.54	0.50	2	middle
K12	Participation in community work to carry out activities that support the environment and improve the quality of the environment and its elements	154	52.9	137	47.1	0.53	0.50	3	middle
K9	Environmental protection plans comply with the requirements of sustainable agriculture and demonstrate the reduction of the impact of agriculture on the environment	147	50.5	144	49.5	0.51	0.50	4	middle
K10	Basic guidelines for protecting plant and animal diversity include in the plan ("biodiversity")	137	47.1	154	52.9	0.47	0.50	5	middle
K11	activity to prevent damage and degradation of wildlife on the farm include in the plan	134	46.0	157	54.0	0.46	0.50	6	middle
K8	Have product a wildlife protection and management plan to mitigate the environmental impacts of agricultural activity	131	45.0	160	55.0	0.45	0.50	7	middle
K1	Identify the waste and sources of pollution resulting from operational processes within the farm made in a list, Waste such as: paper, cardboard, plastic, oils etc.	130	44.7	161	55.3	0.45	0.50	8	middle
K3	Having a documented waste management plan to prevent or reduce pollutants and recycle waste	129	44.3	162	55.7	0.44	0.50	9	middle
K7	The types of waste identified and stored separately	124	42.6	167	57.4	0.43	0.50	10	middle
K4	Fertilize(compost) made from organic waste and used to improve soil properties	119	40.9	172	59.1	0.41	0.49	11	middle
K2	Identifies the sources of pollution resulting from operational processes within the farm made in a list, Sources of pollution such as: excess fertilization, fuel, oils, chemicals, noise, Animal waste .... etc.	117	40.2	174	59.8	0.40	0.49	12	middle
overall level of the pollutant and waste management and environmental protection						0.48	0.38	middle	

Note: 0-0.33 l خ ow, above 0.33-0.67 middle, above 0.67-1 high

It is noted from Table above that The Pollutant and waste management and environmental protection among a sample of farmers in northern Palestine was at a middle level with an mean of (0.48) i.e. (48%) and a standard deviation of (0.38). All sub-items came at middle levels except one item became in high level, as the arithmetic means ranged between (0.72 - 0.40). Item (5) came in first place, which states " the farm and its surrounding areas clean of waste to prevent the provision of a place for the breeding of insects and diseases that affect food safety " at a high level, with an arithmetic mean of (0.72) and a standard deviation of (0.45). It was followed in second place by item (6), which states " Owning specific places on the farm to store papers and waste " at a middle level, with an mean of (0.54) and a standard deviation of (0.50). item (2) came in the twelfth and last place, which states " Identifies the sources of pollution resulting from operational processes within the farm made in a list, Sources of pollution such as: excess fertilization, fuel, oils, chemicals, noise, Animal waste .... etc." at a middle level, with an mean of (0.40) and a standard deviation of (0.49). Although some aspects of environmental cleanliness—particularly those related to waste removal and sanitation—are practiced at a high level, there is a noticeable gap in proactive pollution identification and structured waste management systems. The overall moderate score highlights the need for awareness-raising and training programs. Enhancing these practices will contribute to environmental sustainability, improved food safety, and alignment with national and international environmental protection standards.

3.12 Measuring the extent of adoptionof the PAL-GAP System among farmers in northern Palestine

To assess the extent to which farmers in northern Palestine have adopted or are prepared to adopt the Palestinian Good Agricultural Practices (PAL-GAP) system. This system is designed to ensure food safety, environmental sustainability, and the welfare of agricultural workers in sector G) which contain (G1-G7), The analysis evaluated farmers' perceptions, challenges, and motivations for adopting the PAL-GAP framework. The means and standard deviations were calculated for each indicator, and responses were interpreted using a three-point scale: low (0.00–0.33), moderate (0.34–0.67), and high (0.68–1.00). The results are summarized in Table (10).

Table 10

Frequencies, percentages, averages, deviations, ranks, and the Measuring the extent of adoption of the Pal-GAP among a sample of farmers in northern Palestine at the overall level and items

Num	Indicators	Response				M	SD	Rang	Degree
		Yes		No					
		Fre	%	Fre	%				
G6	Need financial support to implement good agricultural practices pal gap system	271	93.1	20	6.9	0.93	0.25	1	high
G7	Adopting the pal gab system can open great marketing opportunities for you	265	91.1	26	8.9	0.91	0.29	2	high
G5	Need to see other farmers' experiences to adopt the pal Gap system	254	87.3	37	12.7	0.87	0.33	3	high
G1	Obtaining a pal Gap certificate is expensive	209	71.8	82	28.2	0.72	0.45	4	high
G2	Obtaining the pal Gap certificate is difficult in terms of applying the good agricultural practices required to obtain the certificate	181	62.2	110	37.8	0.62	0.49	5	middle
G4	Find it difficult to change the traditional agricultural pattern you practice in growing crops	173	59.5	118	40.5	0.59	0.49	6	middle
G3	Adopting a pal Gap certificate violates the agricultural customs and practices that you practice	133	45.7	158	54.3	0.46	0.50	7	middle
overall level of the Measuring extent of adoption of the pal Gap						0.73	0.25		middle

Note: 0-0.33 low, above 0.33-0.67 middle, above 0.67-1 high

The overall level of adoption or readiness to adopt the PAL-GAP system was assessed as moderate, with a mean score of 0.73 and a standard deviation of 0.25. Although this falls just above the threshold for a high level, it still reflects a transitional stage in the adoption process—where farmers demonstrate openness to the concept but face practical and systemic barriers to full implementation.

The highest-scoring indicator was "the need for financial support to implement the PAL-GAP system" (Indicator G6), which was rated at a high level (M = 0.93, SD = 0.25). This indicates that economic constraints remain the primary barrier to adoption, and that farmers are unlikely to implement the system without targeted subsidies or financial incentives. Similarly, marketing potential was a strong motivating factor, as shown in the second-highest item: "adopting the PAL-GAP system can open great marketing opportunities" (Indicator G7, M = 0.91, SD = 0.29). This finding reflects a strong awareness among farmers of the economic benefits associated with certification and access to premium or export markets. The third-highest scoring indicator was the need to see other farmers' experiences before adopting the PAL-GAP system (Indicator G5, M = 0.87, SD = 0.33). This suggests that peer influence and local success stories could significantly encourage wider adoption.

Other indicators, such as concerns about cost (Indicator G1, M = 0.72) and difficulties in meeting the technical requirements of certification (Indicator G2, M = 0.62), also received moderately high scores. These results suggest that while the value of PAL-GAP is recognized, many farmers feel unprepared or lack the resources to make the necessary changes.

Lower-rated items included resistance to changing traditional agricultural practices (Indicator G4, M = 0.59) and perceptions that PAL-GAP may contradict customary farming methods (Indicator G3, M = 0.46). These responses point to cultural and behavioral challenges in the transition toward more formalized agricultural systems.

These findings indicated that farmers in northern Palestine exhibit a positive attitude toward PAL-GAP adoption, with a generally high level of interest and motivation, particularly regarding the potential for improved market access and food safety. However, the adoption process is hindered by key challenges such as: Financial constraints, Lack

of technical support, Limited exposure to successful local models, and Concerns about disrupting traditional practices.

To enhance the adoption of PAL-GAP, it is recommended that policymakers and extension services provide targeted financial assistance and subsidies for certification-related costs, facilitate training and awareness programs tailored to smallholders, promote peer-learning platforms and model farms, and address behavioral barriers through inclusive dialogue that respects local agricultural knowledge while introducing new practices. These strategies can bridge the gap between awareness and action and ensure broader implementation of sustainable agricultural standards across the Palestinian farming sector.

3.13 Differences in the level of knowledge of the concept of PAL-GAP among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc

This section explored the variations in farmers' knowledge of the PAL-GAP (Palestinian Good Agricultural Practices) concept across different demographic, geographic, educational, and farming-related variables. Means and standard deviations were calculated to assess these differences. Statistical significance was tested using the independent samples t-test (for binary variables) and one-way ANOVA (for categorical variables with more than two groups). The detailed results are presented in appendix (c).

The appendix (c) includes the means (M) and standard deviations (SD) of farmers' knowledge levels regarding the PAL-GAP concept across various demographic, socio-economic, and agricultural characteristics. Differences between groups were assessed using the Independent Samples t-test (for variables with two categories) and One-Way ANOVA (F-Test) (for variables with three or more categories).

Statistical significance is indicated by the test statistic (t or F) followed by asterisks representing the level of significance, as follows: * $p < 0.05$ (significant), ** $p < 0.01$ (highly significant),
*** $p < 0.001$ (very highly significant). Results without asterisks are not statistically significant ($p > 0.05$).

The findings revealed that farmers' knowledge regarding the concept of PAL-GAP varied significantly according to several variables, while others showed no statistically significant influence. Significant differences were observed based on governorate, financial support, type of holding, income level, cultivated greenhouse area, PAL-GAP certification status, and membership in social institutions, indicating that these factors play a meaningful role in shaping farmers' understanding of the PAL-GAP system. In contrast, variables such as gender, age, marital status, place of residence, ownership status of agricultural land, total cultivated land area, low tunnel cultivation, nature of work on the farm, and relationship to family support did not show any statistically significant impact on the level of knowledge, suggesting a more uniform understanding of PAL-GAP across these demographic and operational characteristics.

The findings revealed that several variables are significantly associated with differences in farmers' level of knowledge regarding the concept of PAL-GAP, whereas others demonstrated no statistically significant impact. Among the most influential variables, governorate showed clear disparities, with farmers in Tulkarm reporting the highest average knowledge level ($M = 0.79$), followed by Jenin ($M = 0.70$) and Nablus ($M = 0.64$). The analysis of variance confirmed these differences as statistically significant ($F = 12.862$, $p < 0.001$), suggesting that geographical location may influence exposure to PAL-GAP-related training or institutional support.

It is clear from the results appendix (c) above that there are significant differences in the averages of the level of knowledge of the concept of the Pal GAP among farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.), and to know who the differences are attributed to, the T-Test for two independent samples (T-Test),(p-value), and the One Way ANOVA test were used, with the aim of identifying whether the differences are statistically significant. It is noted from appendix (c) above that there are no statistically significant differences at the significance level ($\alpha = 0.05$) or less in the averages of the level of knowledge of the concept of PAL-GAP among a sample of farmers in northern Palestine according to the variables (gender, age, marital status, number of family members, place of residence, educational qualification, its relationship to supporting the family, nature of work on the farm, percentage of income from agriculture, number of family members currently working, nature of agricultural

holding, total cultivated land area, irrigated cultivated land area, open irrigated cultivated land area, irrigated cultivated land area in low tunnels).

While there are statistically significant differences at the significance level the ($\alpha = 0.05$) or less in the arithmetic means of the level of knowledge of the concept of PAL-GAP among a sample of farmers in northern Palestine according to the variables (governorate and in favor of Tulkarm), income level and in favor of those whose income is (2000-4000) shekels, membership status in social institutions and in favor of their membership status (board member, ordinary member), receiving support and in favor of those who (received support), type of holding and in favor of (plant holding), area of cultivated land irrigated in plastic houses and in favor of area (greater than 0.5 dunums), and obtaining a PAL-GAP certificate and in favor of those who (obtained a PAL-GAP certificate).

3.14 The differences in the level of interest in the concept of PAL-GAP among farmers in northern Palestine based on the variables (governorate, gender, age, social status,).

To determine the level of interest of PAL-GAP, the means and standard deviations were calculated. The t-Test for two independent samples and the One Way ANOVA test were used to examine the significance of the differences in the level of interest in the concept of PAL-GAP among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.), and appendix (d) shows that.

It is clear from the results of appendix (d) above that there are apparent differences in the averages of the level of interest of the concept of Pal GAP among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.), and to know who the differences are attributed to, the T-Test for two independent samples (T-Test),(p-value), and the One Way ANOVA test were used, with the aim of identifying whether the differences are statistically significant.

It is noted from appendix (d) above that there are no statistically significant differences at the significance level ($\alpha = 0.05$) or less in the averages of the level of interest of the concept of PAL-GAP among a sample of farmers in northern Palestine according to the variables (gender, age, marital status, number of family members, place of residence, educational qualification, and income level its relationship to supporting the family,

nature of work on the farm , nature of agricultural holding, total cultivated land area, irrigated cultivated land area, open irrigated cultivated land area,).

While there are statistically significant differences at the significance level (α = 0.05) or less in the means of the level of interest of the concept of PAL-GAP among a sample of farmers in northern Palestine according to the variables (Governorate and in favor of Tulkarem), the status of membership in social institutions and in favor of their membership status (board member, Regular Member), the number of family members currently working in favor of the number of individuals from 5 and less, receiving support and for the benefit of those (receiving support), and the area of cultivated land irrigated in greenhouses and in favor of the area (greater than 3 dunums), irrigated cultivated land area in low tunnels and in favor of the area (more than 1 dunum) and obtaining a Pal Gap certificate and for the benefit of (obtained the Pal Gap certificate).

3.15 Measurement of the evaluation stage of good agricultural practices PAL GAP :(among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.

To determine the Measurement of the evaluation stage of good agricultural practices PAL GAP:(, the means and deviations were calculated and the T-Test for two independent samples and the One Way ANOVA test were used to examine the significance of the Measurement of the evaluation stage of good agricultural practices PAL GAP :(among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.), and appendix (e) shows that.

It is clear from the results of appendix (e) above that there are apparent Measurement of the evaluation stage of good agricultural practices PAL GAP :(among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.), and to know who the differences are attributed to, the T-Test for two independent samples (T-Test),(p-value), and the One Way ANOVA test were used, with the aim of identifying whether the differences are statistically significant.

It is noted from appendix (e) above that there are no statistically significant differences at the significance level (α = 0.05) or less in the arithmetic averages of the Measurement of the evaluation stage of good agricultural practices PAL GAP :(among a sample of farmers in northern Palestine according to the variables (gender, marital status, number

of family members, place of residence, educational qualification, income level, its relationship to supporting the family, nature of farm work, membership status in social institutions, number of family members currently working, receiving support, nature of agricultural holding, total cultivated land area, irrigated cultivated land area, open irrigated cultivated land area, irrigated cultivated land area in low tunnels, obtaining a PAL-GAP certificate.

While there are statistically significant differences at the significance level ($\alpha = 0.05$) or less in the arithmetic means of the Measurement of the evaluation stage of good agricultural practices PAL GAP :(among a sample of farmers in northern Palestine according to the variables (Governorate and in favor of Tulkarem), age and in favor of age from 40-60, type of holding and in favor of (plant holding), and the area of cultivated land irrigated in greenhouses and in favor of the area (less than 3 dunums).

3.16 The differences in the common practices for record keeping and internal self-inspection on the farm among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc

To determine the common practices for record keeping and internal self- inspection on the farm, the means and deviations were calculated and the T-Test for two independent samples and the One Way ANOVA test were used to examine the significance of the differences in the common practices for record keeping and internal self- inspection on the farm among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.), and appendix (f) shows that.

It is clear from the results of appendix (f) above that there are apparent differences in the arithmetic averages of the common practices for record keeping and internal self-inspection on the farm among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.), and to know who the differences are attributed to, the T-Test for two independent samples (T-Test),(p-value), and the One Way ANOVA test were used, with the aim of identifying whether the differences are statistically significant.

It is noted from appendix (f) above that there are no statistically significant differences at the significance level ($\alpha = 0.05$) or less in the arithmetic averages of the common practices for record keeping and internal self- inspection on the farm among a sample of farmers

in northern Palestine according to the variables (Gender, age, marital status, Place of residence, educational qualification, income level, relationship to family support, Nature of work on the farm, number of family members currently working, Type of holding, Total cultivated land area , Total cultivated land area (irrigated), Cultivated land area (the exposed irrigated) .

While there are statistically significant differences at the significance level ($\alpha = 0.05$) or less in the arithmetic means of the common practices for record keeping and internal self-inspection on the farm among a sample of farmers in northern Palestine according to the variables (Governorate and in favor of Tulkarem and Jenin), the number of family members in favor of (the number of individuals 4 or more), the status of membership in social institutions and in favor of their membership status (board member, Regular member), receiving support and for the benefit of those (receiving support), the nature of agricultural holding and in favor of (guarantee), the area of irrigated cultivated land in greenhouses and in favor of the area (0.5-1), the area of cultivated land irrigated in low tunnels in favor of the area (0.5 or more) and obtaining a Pal Gap certificate and for the benefit of (obtained the Pal Gap certificate).

3.17 The differences in the good agricultural practices that the farmer does in the farm among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc

To determine the good agricultural practices that the farmer does in the farm, the means and deviations were calculated and the T-Test for two independent samples and the One Way ANOVA test were used to examine the significance of the differences in the good agricultural practices that the farmer does in the farm among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.), and appendix (g) shows that.

It is clear from the results of appendix (g) above that there are apparent differences in the arithmetic averages of the good agricultural practices that the farmer does in the farm among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.), and to know who the differences are attributed to, the T-Test for two independent samples (T-Test),(p-value), and the One Way ANOVA test were used, with the aim of identifying whether the differences are statistically significant.

It is noted from appendix (g) above that there are no statistically significant differences at the significance level (α = 0.05) or less in the arithmetic averages of the good agricultural practices that the farmer does in the farm among a sample of farmers in northern Palestine according to the variables (gender, age, marital status, place of residence, educational qualification , and income level its relationship to supporting the family, nature of work on the farm, number of family members currently working, nature of agricultural holding, total cultivated land area, irrigated cultivated land area, open irrigated cultivated land area.

While there are statistically significant differences at the significance level (α = 0.05) or less in the arithmetic means of the good agricultural practices that the farmer does in the farm among a sample of farmers in northern Palestine according to the variables (Governorate and in favor of Tulkarm and Jenin), the number of family members in favor of (the number of individuals 4 and more), the status of membership in social institutions and in favor of those who are members (Board Member, Regular Member), and receive support and for the benefit of those (received support), and the nature of agricultural holding in favor of (guarantee), and the area of cultivated land irrigated in greenhouses and in favor of the area (0.5-1 dunums), the area of cultivated land irrigated in low tunnels in favor of the area (more than 1 dunum) and obtaining a certificate of Pal Gap and for the benefit of (obtained a certificate Pal Gab).

3.18 The differences in the level of health, safety, and welfare of workers Risk) : (Assessment among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc

To determine the level of health, safety and welfare of workers (Risk Assessment), the means and deviations were calculated and the T-Test for two independent samples and the One Way ANOVA test were used to examine the significance of the differences in the level of health, safety and welfare of workers (Risk Assessment) among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.), and appendix (h) shows that.

It is clear from the results of appendix (h) above that there are apparent differences in the arithmetic averages of the level of health, safety and welfare of workers Risk: (Assessment among a sample of farmers in northern Palestine according to the variables

(governorate, gender, age, social status, etc.), and to know who the differences are attributed to, the T-Test for two independent samples (T-Test),(p-value), and the One Way ANOVA test were used, with the aim of identifying whether the differences are statistically significant.

It is noted from appendix (h) above that there are no statistically significant differences at the significance level ($\alpha = 0.05$) or less in the arithmetic averages of the level of health, safety and welfare of workers (Risk Assessment) among a sample of farmers in northern Palestine according to the variables (Gender, age, marital status, place of residence, educational qualification, His relationship with family support, Nature of work on the farm, number of family members currently working , Nature of agricultural holding , type of holding , total cultivated land area, Total cultivated land area (irrigated), Cultivated land area (the exposed irrigated), Cultivated land area irrigated in greenhouses , obtaining a Pal Gap certificate).

While there are statistically significant differences at the significance level ($\alpha = 0.05$) or less in the arithmetic means of the level of health, safety and welfare of workers Risk) : (Assessment among a sample of farmers in northern Palestine according to the variables (governorate and in favor of Tulkarm, Jenin), Number of family members in favor of (4-5 individual, 9 or more), income level and in favor of those whose income is (2000-4000) shekels, membership status in social institutions and in favor of their membership status (board member, ordinary member), receiving support and in favor of those who (received support), area of cultivated land irrigated in tunnel and in favor of area (more than 1 dunums), and obtaining a PAL-GAP certificate and in favor of those who (obtained a PAL-GAP certificate).

3.19 The differences in the pollutant and management and environmental protection in the farm among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)?

To determine the pollutant and management and environmental protection in the farm the means and deviations were calculated and the T-Test for two independent samples and the One Way ANOVA test were used to examine the significance of the differences in the pollutant and management and environmental protection in the farm among a sample

of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.), and appendix (i) shows that.

It is clear from the results of appendix (i) above that there are apparent differences in the arithmetic averages of the pollutant and management and environmental protection in the farm among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.), and to know who the differences are attributed to, the T-Test for two independent samples (T-Test),(p-value), and the One Way ANOVA test were used, with the aim of identifying whether the differences are statistically significant.

It is noted from appendix (i) above that there are no statistically significant differences at the significance level ($\alpha = 0.05$) or less in the arithmetic averages of the pollutant and management and environmental protection in the farm among a sample of farmers in northern Palestine according to the variables (Gender, age, marital status, place of residence, educational qualification, relation to family support, nature of farm work, number of family members currently working, type of agricultural holding, total cultivated land area, irrigated cultivated land area, open irrigated cultivated land area).

While there are statistically significant differences at the significance level ($\alpha = 0.05$) or less in the arithmetic means of the pollutant and management and environmental protection in the farm among a sample of farmers in northern Palestine according to the variables (governorate and in favor of (Tukaram, Jenin), Number of family members and in favor of (four and more) , income level and in favor of those whose income is (2000-4000) shekels, membership status in social institutions and in favor of their membership status (board member, Regular Member), receiving support and in favor of those who (received support), Nature of agricultural holding and in favor of (guarantee), area of cultivated land irrigated in greenhouses and in favor of area (0.5-1 dunums), irrigated cultivated land area in low tunnels and in favor of area (0.5 and more) ,and obtaining a PAL-GAP certificate and in favor of those who (obtained a PAL-GAP certificate).

3.20 The differences in the measuring the extent adoption of the pal Gap among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)?"

To determine the measuring the extent adoption of the pal Gap, the means and deviations were calculated and the T-Test for two independent samples and the One Way ANOVA test were used to examine the significance of the differences in the measuring the extent adoption of the pal Gap among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.), and appendix (j) shows that.

It is clear from the results of appendix (j) above that there are apparent differences in the arithmetic averages of the measuring the extent adoption of the pal Gap among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.), and to know who the differences are attributed to, the T-Test for two independent samples (T-Test),(p-value), and the One Way ANOVA test were used, with the aim of identifying whether the differences are statistically significant.

It is noted from appendix (j) above that there are no statistically significant differences at the significance level ($\alpha = 0.05$) or less in the arithmetic averages of the measuring the extent adoption of the pal Gap among a sample of farmers in northern Palestine according to the variables (Governorate, gender, marital status, number of family members, place of residence, educational qualification, income level, its relationship to supporting the family, nature of farm work, membership status in social institutions, number of family members currently working, receiving support, nature of agricultural holding, type of holding, total irrigated cultivated land area in greenhouses, obtaining a PAL-GAP certificate) .

While there are statistically significant differences at the significance level ($\alpha = 0.05$) or less in the arithmetic means of measuring the extent adoption of the pal Gap among a sample of farmers in northern Palestine according to the variables (age and in favor of (30 -39years,50-59 years) , Total cultivated land area and in favor of area (less than 4 dunums), Total cultivated land area (irrigated)and in favor of area (10 dunums and less), Cultivated land area (the exposed irrigated) and in favor of area (10 dunums and less), irrigated cultivated land area in low tunnels and in favor of area (less than 0.5 dunums) .

Chapter Four

Discussion, , Conclusions and Recommendations

4.1 Farmers' Knowledge of the PAL-GAP in Northern Palestine

The findings of this study indicate a high level of knowledge among farmers regarding the concept of Palestinian Good Agricultural Practices (PAL-GAP). These result is consistent with the result of the study of (Fathy, Anwer, Ramadan, & Barga, 2023), which concluded that the level of knowledge among agricultural extension workers reached (85.7%) at a high level.

The result of this study differs from the result of the study of El-Habbal et al., (2015), which conducted on a sample of (315) wheat farmers in Alexandria Governorate in Egypt, which concluded that the level of knowledge of plant agricultural processes reached (45.3) at a moderate level, while in the current study it reached a high level.

However this study result differs from the result of the study of (Fathy, Anwer, Ramadan, & Barga, 2023), that agricultural knowledge management in the agricultural extension organization in Beheira Governorate from the viewpoint of extension workers in Egypt, which concluded that the level of awareness of extension workers in Egypt reached (29.1) at a moderate level, while in the current study it reached a high level.

On the other hand this study result are consistent with the results of Ramadan study (2023), which was conducted on a random sample of 30 experts, 30 specialists and 30 farmers from Dakahlia Governorate in Egypt, where it dealt with an analytical study of the knowledge and implementation gap in Good Agricultural Practices (GAP) for export crops, which concluded that the level of knowledge of good agricultural practices (GAP) was high.

The researcher attributes this result to the presence of modern communication , media, and satellite television channels that made the world smaller due to the widespread access to the Internet sites that facilitate access to the information that the farmer wants . In addition, the Palestinian Ministry of Agriculture and non-governmental institutions carry out many agricultural activities such as courses, workshops, farmer field schools, agricultural observations and text messages.

4.2 Interest in the PAL-GAP Concept Among Farmers in Northern Palestine

This study results are in consistent with the results of the Ramadan study (2023), where the research was conducted in Dakahlia Governorate in Egypt as one of the largest governorates where there are farmers to export agricultural crops such as onions and potatoes, which concluded that the level of interest in good agricultural practices was high.

4.3 Evaluation of good agricultural practices of PAL-GAP Among Farmers in Northern Palestine.

On the other hand this study result are consistent with the results of the Ramadan study (2023), conducted in Dakahlia Governorate in Egypt, which concluded that the level of evaluation of good agricultural practices was high.

4.4 The common practices for record keeping and internal self- inspection on the farm among farmers in Nnorthern Palestine

The result of this study differs from the result of the study of Abd Elsalam and Elnagar (2021), which dealt with measuring the adoption of farmers of some good agricultural practices in Assiut Governorate in Egypt, which concluded that the level of record keeping, and internal self-inspections was at a high level, while in the current study it was at an average level.

4.5 The good agricultural practices that the farmer does in the farm Aamong Farmers in Nnorthern Palestine

This study rusult is consistent with the study of (Amer, Nawara, & Al Atrabi, 2023), conducted on maize crop in Gharbia Governorate in Egypt, which concluded that the level of knowledge of good agricultural practices reached an average level.

The result of this study differs from the study of El-Habbal et al., (2015), was conducted on a sample of (315) wheat farmers in Alexandria Governorate in Egypt, which concluded that the most common agricultural problems were, in order (fertilizer management, water management, soil management, integrated pest management, plant quality and health), while the current study concluded that the most prominent problem was Good agricultural practices (water management).

However this study result are consistent with the study of El-Rasoul (2019), which aimed to measure the determinants of farmers' performance of good agricultural practices for grape crop farmers in Nubaniya Governorate in Egypt, which concluded that farmers who use good agricultural practices have good fertilizer management and good management of pesticides and pests.

On the other hand this result study differs from the study of El-Rasoul et al. (2019), the study was conducted on a sample of 50 grape growers in the Nubaniya region in Egypt which concluded that the most common practices for service transactions and preparing land for agriculture were (soil management) and the lowest, while the current study concluded that the best agricultural practices were (pesticide and pest management).

The researcher attributes this result to the lack of irrigation water in the agricultural sector due to the Israeli occupation’s control over (95%) of the water sources in the Palestinian territories.

In addition to the excessive use of fertilizers by farmers without specifying the plant's need for fertilizers and because of the small number of farmers who analyze the soil to find out the components of the soil of the basic elements necessary to feed the crop.

a- Plant quality and health

The result of this study is consistent with the result of the study of (Amer, Nawara, & Al Atrabi, 2023), in Gharbia Governorate in Egypt, where Egypt ranks first in the Arab world in terms of maize production, as it produces 83.3% of Arab production. which concluded that the level of harvesting and post-harvest practices was (65.4%), while in this study it reached (61%), all at an average level.

The result of this study differs from the result of the Ramadan study (2023), conducted in Dakahlia Governorate in Egypt which concluded that the level of plant quality and health (73.3%) was at a high level, while in the current study (61%) it was at an average level.

The result of this study differs from the study of Abd Elsalam and Elnagar (2021), which considers that the emergence of the concept of good agricultural practices has emerged during recent years in the context of the rapid change of the food economy and its globalization to reach high agricultural production and a high-quality crop at the agricultural level in Egypt, which concluded that the level of having a designated place

for packing and sorting as part of the quality, safety and health of the plant was at a high level, while in the current study it was at a medium level.

The researcher attributes this result to the lack of interest and knowledge on the part of Palestinian farmers in conducting post-harvest transactions, and this is due to the lack of packing and packaging centers for fresh vegetables and fruits in Palestine, as well as due to the high cost of these centers.

b- Soil management and protection

The result of this study is consistent with the results of the study of (Amer, Nawara, & Al Atrabi, 2023), which indicates that educating farms about good agricultural practices is necessary to obtain high productivity of agricultural crops, especially when growing maize, where the land must be leveled with a laser and good plowing of the land, which made the productivity of an acre reach 35-40 ardeb in Egypt, which concluded that the level of soil management reached (69.7%), while in this study it reached (61%), all at an average level.

The result of this study differs from the study of Abd Elsalam and Elnagar (2021), which was conducted on a sample of (100) farmers from Asio Governorate from Egypt, which concluded that the level of conducting soil analysis as part of soil management was at a high level, while in the current study it was at a medium level.

The researcher attributes this result to the farmer's lack of awareness of the importance of conducting a soil analysis before planting the crop to know the soil stock of elements and the weakness of the farmer with his ability to identify the plants need of organic fertilizers and chemical fertilizers.

c- fertilizer management

The result of this study is consistent with the results of the study of (Amer, Nawara, & Al Atrabi, 2023), which was conducted on the maize crop in Gharbia Governorate in Egypt, which concluded that the level of agricultural operations practices reached (50.5%), while in this study it reached (64%), all at an average level.

d- Water management

The result of this study differs from the result of Tolba and Tahawy's study (2020), where the study was conducted on 150 farmers in Beheira Governorate in Egypt, which

concluded that the level of water management reached (70%) at a high level, while the percentage in this study reached (47%) at a moderate level.

The result of this study differs from the result of the Ramadan study (2023), conducted in Dakahlia Governorate in Egypt, which concluded that the level of water management reached (68.8%) at a high level, while the percentage in this study reached (47%) at a medium level.

The result of this study is consistent with the result of the study of (Amer, Nawara, & Al Atrabi, 2023), which was conducted on the maize crop in Gharbia Governorate in Egypt, which concluded that the level of agricultural operations practices reached (50.5%), while in this study it reached (47%), all of which are at an average level.

The result of this study is consistent with the study of Abd Elsalam and Elnagar (2021), which was conducted on a sample of (100) farmers from Asio Governorate from Egypt, which concluded that the level of irrigation water analysis as part of water management was at an average level.

The researcher attributes this result to the lack of awareness by farmers of the importance of determining the plant's need for water, despite its use of modern irrigation methods such as drip irrigation networks and sprinklers, which reduce water waste in general, as well as the limited water sources due to their control by the occupation forces.

e- Integrated pest management

The result of this study differs from the result of the study of (Amer, Nawara, & Al Atrabi, 2023), which was conducted on the maize crop in Gharbia Governorate in Egypt, which concluded that the level of agricultural operations practices reached (50.5%) at a moderate level, while in this study it reached (68%) at a high level.

The result of this study differs from the study of Abd Elsalam and Elnagar (2021), in Assiut Governorate in Egypt, which concluded that the level of analysis of pesticide residues as part of integrated pest management was at a high level, while in the current study it was at a moderate level.

The researcher attributes this result to the weakness of the farmer to make plant analysis to know the pesticide residues and not to follow the instructions for the safety period of

pesticides due to the weakness of agricultural control and the Palestinian Consumer Protection Committee on fresh vegetable agricultural products of vegetables and fruits.

4.6 Health, Safety, and Welfare of Workers: (Risk Assessment) Among farmers in Northern Palestine

The result of this study differs from the result of the Ramadan study (2023), conducted in Dakahlia Governorate in Egypt, which concluded that the level of health, safety and welfare of workers was at a high level, while in the current study it was at an average level.

4.7 The Pollutant and waste management and environmental protection Among farmers in Northern Palestine

The researcher attributes this result to the weak awareness of the Palestinian society in the exploitation of farm waste and sorting waste into materials such as iron, plastic, cardboard, herbs, crop residues and exploiting these residues and converting them into materials so that they are a by-product of the farm or selling them to parties that exploit them in recycling.

4.8 The Measuring extent of adoption ofthe pal Gap Among farmers in northern Palestine

The result of this study differs from the result of the Ramadan study (2023), conducted in Dakahlia Governorate in Egypt, which concluded that the level of adoption of good agricultural practices was at a high level, while in the current study it was at a moderate level.

The researcher attributes this result to the fact that the number of farmers who obtained the Palestinian Pal GAP certificate is very low, amounting to (10%), according to the study sample.

4.9 The differences in the level of knowledge of the concept of Pal-Gab Among farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)

The result of this study differs from the study of Talaba and Tahawi (2020), which dealt with the preferred agricultural extension communication methods for farmers to develop

awareness of rationalizing the use of irrigation water in Beheira Governorate in Egypt, which concluded that (80%) of those with an academic qualification have greater knowledge and awareness, while this study concluded that there are no differences in the academic qualification variable.

The result of this study also differed with the study of Tolba and Tahawy (2020), where the study was conducted on 150 farmers in Beheira Governorate in Egypt, which concluded that the age group (56 years and over) has greater knowledge and awareness, while this study found that there are no differences according to the age variable.

The result of this study also differed from the study of Tolba and Tahawy (2020), which found that those with a university qualification amounted to 80% of the sample conducted on 150 farmers in Beheira Governorate in Egypt, where it was found that they have more knowledge and awareness, while this study concluded that there are no differences for the academic qualification variable.

The result of this study also differed with the study of Tolba and Tahawy (2020), which was conducted on 150 farmers in Beheira Governorate in Egypt, where it was found that 75.3% of the sample ranges from (5 to less than 8 members), which concluded that a family that includes a number of working members (from 5 to less than 8 members) has greater knowledge and awareness, while this study found that there are no differences in the number of variable members of the working family.

The result of this study differs from the study of El-Habbal et al., (2015), conducted on a sample of (315) farmers in Alexandria governorate in Egypt, which concluded that the age group (53 years or less) has greater knowledge and awareness.

The result of this study differs from the study of El-Habbal et al., (2015), which was conducted on a sample of (315) farmers growing wheat in Alexandria Governorate in Egypt which concluded that the marital status (married) that reached (92.4%) has more knowledge and awareness.

The result of this study is consistent with the study of El-Habbal et al., (2015), conducted on (315) farmers from Alexandria Governorate in Egypt, which concluded that there are no differences in the level of knowledge and awareness depending on the variable number of working family members. There are also no differences in the level of knowledge and

awareness depending on the academic qualification variable, and there are no differences in the level of knowledge and awareness depends on the variable area of open irrigated land.

The result of this study differs from the study of El-Habbal et al., (2015), conducted on (315) farmers from Alexandria Governorate in Egypt, where the study showed that (49.84%) of them are not members of social institutions while (19.68%) of them are members of community institutions and (30.47%) with an administrative rank in social institutions, which concluded that there are differences in the level of knowledge and awareness depending on the variable of membership status in social institutions - non-participation, while in the current study it was found that there are differences in favor of (member of the board of directors (high participation),) Ordinary member (moderate participation).

The researcher attributes in this result to the Palestinian society an educated society and there is no illiteracy according to recent statistics, and this indicates the high level of awareness of the Palestinian farmer, I wonder whether the Palestinian farmer accepts the change in the behavior that is practiced in the daily agricultural practices that farmer does or that the weakness of the economic situation makes him not risk accepting change.

4.10 The differences in the level of interest of the concept of PAL-GAP Among farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)

The researcher attributes this result to the fact that the farmer interested in agricultural practices Pal Gap is a farmer affiliated with an agricultural association or a farmer who has a large agricultural holding, because he seeks to increase profitability and improve income.

4.11 The differences in the level of evaluation of the concept of Pal-Gab among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)

The researcher attributes this result to the low percentage of farmers who have a Pal Gap certificate and thus the weak awareness of farmers of good agricultural practices that must be carried out by the farmer to obtain the Pal Gap certificate due to the weakness of the

agricultural media by introducing the farmer to the Pal Gap certificate and how to obtain it and the benefits that accrue to the farmer when obtaining the certificate.

4.12 The differences in the common practices for record keeping and internal self-inspection on the farm among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)

The researcher attributes this result to the farmer's interest in maintaining the records of the farm as an integer of the farm more than its owner in order to preserve his financial right as farmer is the one who manages the farm and takes care of it.

4.13 The differences in the good agricultural practices that the farmer does in the farm among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)

The results of this study are consistent with the results of the study of (Amer, Nawara, & Al Atrabi, 2023), Which was conducted on the maize crop in the Gharbia Governorate in Egypt, which concluded that there are no differences in the level of good agricultural practices according to the age variable.

The results of this study differ from the results of the study of (Amer, Nawara, & Al Atrabi, 2023), Which was conducted on the maize crop in the Gharbia Governorate in Egypt, which concluded that there is a positive direct relationship between the level of good agricultural practices and the educational level. It also agrees with it that there is a positive direct relationship between the level of good agricultural practices and leadership. It also agrees with it that there are no differences in the level of good agricultural practices according to the number of working family members. It also agrees with it that there are no differences in the level of good agricultural practices according to the area of open irrigated holdings.

The results of this study differ from the study of El-Habbal et al., (2015) conducted in Alexandria Governorate in Egypt, which concluded that there is a negative inverse relationship between good agricultural practices and age, as well as a negative inverse relationship between good agricultural practices and the number of family members currently employed.

The results of this study are consistent with the study of El-Habbal et al., (2015), which was conducted on 315 farmers to find out the role of agricultural satellite television channels in improving the knowledge level of wheat cultivation in Alexandria Governorate in Egypt, which concluded that there are no differences in the application of good agricultural practices according to the social status variable. It also concluded that there were no differences in the implementation of good agricultural practices according to the variables of open agricultural land area. It also concluded that there are differences in the application of good agricultural practices according to the variable of membership in social institutions in favor of (board member, ordinary member).

The result of this study differs from the study of El-Habbal et al., (2015), which was conducted on (315) farmers, among whom the illiteracy rate was (28.4%) while (9.21%) of them had a university degree in Alexandria Governorate in Egypt, which concluded that there is a direct positive relationship between the application of good agricultural practices and the educational level, while the current study concluded that there are no differences in the application of good agricultural practices according to educational level.

The researcher attributes this result to the fact that the most of the married farmers who obtained the certificate of Pal Gab are most of them member in social institutions and therefore their percentage to do good agricultural practices is more than others.

4.14 The differences in the level of health, safety and luxury of workers Risk) :: (Assessment among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)

The researcher attributes this result to the fact that the farmer's interest in the health and well-being of workers increases with the farmer's high level of income and obtaining support to increase profitability.

4.15 The differences in the pollutant and management and environmental protection in the farm among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)

The results of this study are consistent with the result of Khalifa's study (2023), which dealt with the rural population's awareness of the environmental risks resulting from climate change and the mechanisms to reduce them , that conducted on a sample of (150) farmers in Beheira Governorate in Egypt, which concluded that there are no differences in the management of pollutants and waste and environmental protection according to the age variable, and the number of family members, and also agrees with it that there are differences in the management of pollutants and waste and environmental protection according to the variable of membership in organizations, while it differs with it in that there are no differences in the management of pollutants and waste and environmental protection according to the variable of the total land area.

4.16 The differences in the measuring the extent adoption of the pal Gap among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)

The result of this study differs from the study of Abd Elsalam and Elnagar (2021), in Assiut Governorate in Egypt, which showed that there is no relationship between age and the level of farmers' adoption, while this study showed that the level of adoption was higher among age groups (from 30-39 years, and from 50-59 years). The study of Abd Elsalam and Elnagar (2021), which showed that there is no relationship between the size of agricultural holdings and the level of farmers' adoption, also differed from the result of this study, which concluded that there are differences in the total cultivated land area in favor of the area (less than 4 dunums), the area of irrigated cultivated land in favor of the area (10 dunums or less), the area of irrigated cultivated land in open areas in favor of the area (10 dunums or less), and the area of irrigated cultivated land in low tunnels in favor of the area (less than 0.5 dunums).

While the results of this study agreed with the results of the study of Abd Elsalam and Elnagar (2021), in Assiut Governorate in Egypt, which showed that there is no relationship between educational qualification, number of family members, membership in social organizations and its degree, and the size of agricultural holdings in greenhouses with the level of adoption among farmers.

The researcher attributes this result to the small size of agricultural holding among most Palestinian farmers due to the fragmentation of ownership, the small size of land in which water sources are available, and the high price of a cup of water in most sites that suffer from the lack of groundwater and artesian wells.

4.17 Conclusions

The most prominent problem for Palestinian farmers is the management of irrigation water, due to the lack of water sources due to the occupation control over 95% of it, followed by the problem of soil management, then the health and quality of plants, and then fertilizer management, while the lowest problem the farmer suffers from is the management of pesticides and pests, so the farmer must pay attention to determining the plant's need for water and determining modern irrigation methods from drip irrigation networks, sprinklers or others, which contribute to rationalizing the use of water in agriculture. Interestingly, pesticide and pest management were perceived as the least problematic, despite the fact that pesticide use in Palestine is often intensive and poorly regulated, raising concerns about environmental contamination, resistance development, and food safety. This discrepancy suggests a possible underestimation by farmers of the long-term impacts of excessive pesticide use.

The level of knowledge and interest in good agricultural practices came at a high level due to the participation of farms in the activities carried out by the Ministry of Agriculture and partner institutions in the development of the agricultural sector, in addition to the presence of social media that made the world a small homeland.

The farmer's level of interest in the quality and health of the plant came at a medium level, due to the farmer's lack of knowledge of post-harvest processes and standards that can reduce the loss of obtaining after harvest, due to the lack of appropriate packaging centers close to the farm, which increases production costs for the farmer along the production chain.

The farmer's level of interest in soil management came at an average level, due to the farmer's lack of awareness of the interest in conducting soil analysis to find out the soil stock of elements and thus choose the type of plant to be planted and the needs the farmer needs from organic and inorganic fertilizers.

The level of knowledge and awareness of good agricultural practices was not affected by differences according to the variable of the number of family members, educational qualification, area of agricultural holding, and membership status in social institutions. This is likely to increase the level of awareness among the Palestinian farmer. But the farmer's adoption of good agricultural practices needs to change the marketplaces carried out by the farmer on the farm, and this needs time and increased costs in production inputs and the length of the production chain. This suggests that the number of farmers who obtained the Pal Gap certificate amounted to 10% in the study sample. The farmer interested in agricultural practices Pal Gap is the farmer affiliated with an agricultural association or the farmer who has a large agricultural holding, because he seeks to increase profitability and improve income.

The level of knowledge in the management of pollutants and waste and environmental protection was not affected by differences according to the variable of age, the number of family members, the status of membership in social institutions, and this is likely to the limited public awareness of the farmer and the Palestinian society in awareness of the importance of sorting agricultural waste and exploiting plant residues in the production of compost and thus obtaining a by-product for the farm, which increases the profitability of the farmer.

4.18 Recommendations

Work to regulate the excessive use of pesticides by farmers, which affects the environment and food safety in the absence of oversight by committees formed by several government ministries.

Encourage farmers to obtain the Bal Cap certificate by holding workshops and supporting projects, especially in Nablus Governorate and governorates famous for vegetable cultivation, such as Tubas and the Jordan Valley, as they are considered Palestine's food basket.

Increase farmers' knowledge of plant quality and health by holding courses and workshops that familiarize farmers with post-harvest processes and standards that contribute to reducing crop losses, in addition to providing support projects to provide suitable packaging centers close to the farm and their impact on production costs throughout the production chain.

List of Abbreviations

Abbreviation	Meaning
GAP	Good agricultural practices.
PAL-GAP	Palestinian Good Agricultural Practices
FAO	Food and Agriculture Organization
MoA	Ministry of Agriculture
HACCP	Hazard Analysis Critical Control Point.
PCBS	The Palestinian Central Bureau of Statistics
PSI	The Palestinian Standards Institution
PSI	Palestine Standards Institution,
NGOs	non-governmental organizations
AOAD	Arab Organization for Agriculture Development
M	Mean
SD	Stander Deviation

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Appendices

Appendix A

Initial Image

جامعة النجاح الوطنية

كلية الدراسات العليا

برنامج إنتاج نباتي ووقاية نبات

استبيان

دراسة العوامل المؤثرة في تبني المزارعين لبعض الممارسات الزراعية الجيدة الفلسطينية

(البال جابPAL-GAP)

المزارعات المحترمات / المزارعين المحترمين

تحيه وبعد،،

تقوم الباحثة بإجراء دراسة علمية بعنوان "العوامل المؤثرة في تبني المزارعين لبعض الممارسات الزراعية الجيدة الفلسطينية (البال جاب) بمحافظتي نابلس وطولكرم ", وذلك استكمالاً للحصول على درجة الماجستير في إنتاج نباتي ووقاية نبات/ كلية الدراسات العليا في جامعة النجاح الوطنية.

ونظراً لما تتمتع به من خبرة واسعة وكفاءة عالية ومتميزة تعزز من إمكانية تحقيق أغراض الدراسة، أرجو التكرم بتعبئة هذه الاستبانة بموضوعية ووفق قناعاتكم الشخصية، علما بان البيانات والمعلومات التي ستدلون بها سوف تستخدم لأغراض الدراسة والبحث العلمي فقط، وسيتم التعامل معها بسرية تامة.

شكراً لكم تعاونكم

الباحثة : حنين المصري

المتغيرات الديمغرافية (المعلومات الشخصية): (A) **يرجى وضع إشارة (X) في المكان الذي يناسب خيارك فيما يلي:**					
A1	**اسم جامع البيانات :**				
A2	**رقم الاستبيان المتسلسل :**				
A3	**اسم المزارع :**		**رقم هاتف المزارع:**		
A4	**المحافظة :**	○نابلس	○طولكرم	○جنين	
A5	**اسم التجمع :" القرية"**	**.....**			
A6	**النوع الاجتماعي :**	○**ذكر**	○**انثى**		
A6 **A7**	**العمر:**	○من 18 سنة - أقل من 25 سنة	○من 25 سنة - أقل من 30 سنة		
		○من 30 سنة - أقل من 40 سنة	○من 40-اقل من 50 سنة		
		○من 50 سنة – اقل من 60 سنة	○من 60 سنة فاكثر		
A8	**الحالة الاجتماعية:**	○أعزب	○متزوج	○أرمل	○مطلق
A9	**عدد افراد الاسرة:**	○1-3	○4-5	○6-8	○9 فأكثر
A10	**مكان السكن:**	○مدينة	○قرية	○مخيم	
A11	**المؤهل العلمي:**	○ثانوية فاقل	○دبلوم	○بكالوريوس	○دراسات عليا
A12	**مستوى الدخل :**	○اقل من 2000	○2000-4000	○اكثر من 4000	
A13	**علاقته بإعالة الاسرة:**	○المعيل الرئيسي	○احد المعيلين	○ذلك	
A14	**طبيعة العمل بالمزرعة:**	○عمل كلي	○عمل جزئي		
A15	**صفة العضوية في المؤسسات الاجتماعية:**	○عضو مجلس ادارة	○عضو عادي	○غير مشترك	

الوضع الاقتصادي لأسرة المستفيد: (بما فيهم المستفيد ذاته): (B)		
B1	**ما هي نسبة الدخل من الزراعة بالنسبة لدخل الاسرة :**	النسبة ..... %
B2	**عدد أفراد الأسرة العاملين حاليا:**	(.....) فرد
B3	**اذا كنت قد تلقيت دعم عيني او مادي من المؤسسات الحكومية وغير الحكومية اخر 3 سنوات ؟ كم تقدر قيمة الدعم المادية (بالشيكل) ؟**	(.....) بالشيكل

الحيازة الزراعية: (C)					
C1	طبيعة الحيازة الزراعية:	ملك ◯	مستأجرة ◯	ضمان ◯	زارعة ◯
C2	نوع الحيازة:	نباتية ◯	حيوانية ◯	مختلطة ◯	

الحيازة الزراعية					
الرقم	**الحيازة الزراعية**	**نوع المحصول / بالدونم**			
	نوع المحصول	**خضار**	**حقليه**	**نباتات طبية**	**غيرها**
C8	مساحة الأرض الإجمالية المزروعة (بالدونم).				
C9	مساحة الأرض المزروعة (المروية الاجمالية)				
C10	مساحة الأرض المزروعة (المروية المكشوفة)				
C11	مساحة الأرض المزروعة (المروي في البيوت البلاستيكية)				
C12	مساحة الأرض المزروعة (المروية في انفاق منخفضة)				
C13	كمية الإنتاج للدونم في العام الزراعي(بذور أو ثمار) بالطن				
C14	كمية البذور أو ثمار التي تبيعها في العام الزراعي (طن)				

C15	كمية الاستهلاك المنزلي من المحصول في العام الزراعي (البذور أو ثمار) بالطن				
C16	كمية الإنتاج المباعة في السوق المحلي من المحصول في العام الزراعي (البذور أو ثمار) بالطن				
C17	كمية التصدير من المحصول في العام الزراعي (البذور أو ثمار) بالطن				

قياس مدى المعرفة بمفهوم البال جاب			
الرقم	**السؤال**	**ضع اشارة حول الاجابة**	
D1	هل سمعت بشهادة الممارسات الزراعية الجيدة العالمية(الجلوبل جاب Global-GAP)؟	نعم	لا
D2	هل سمعت عن الانتاج الزراعي الامن ؟	نعم	لا
D3	هل سمعت بشهادة البال جاب PAL - GAP؟	نعم	لا
D4	هل يوجد فرق بين الممارسات الزراعية الجيدة " البال جاب " والممارسات الزراعية الأمنه ؟	نعم	لا
D5	من اين سمعت بشهادة البال جاب : " تحدد برقم تصاعدي من 1-5 حسب ايهما سمعت اكثر ".		
	وزارة الزراعة	مزارعين	
	مؤسسات غير حكومية	مواقع النت	
	مواقع التواصل الاجتماعي " فيس ، واتس	اخرى	
D6	هل تعرف ما هي شهادة البال جاب؟	نعم	لا
D7	هل تعرف شروط ومتطلبات الحصول على شهادة البال جاب ؟	نعم	لا
D8	هل ترغب بالحصول على شهادة البال جاب ؟	نعم	لا
D9	هل تحتاج الى تدريب لزيادة المعرفة للحصول على شهادة البال جاب ؟	نعم	لا

D10	هل تمتلك القدرة المادية للحصول على شهادة البال جاب ؟	نعم	لا
D11	هل حصلت على شهادة البال جاب؟	نعم	لا
D12	اذا نعم : على اي منتج حصلت على شهادة البال جاب ..... متى / حدد السنة ..... كم مرة		
D13	هل تعتقد ان شهادة البال جاب تفتح افاق تسويقية جديدة لك ؟	نعم	لا
D14	هل تعتقد ان حصولك على شهادة البال جاب تخفض من تكاليف الانتاج على المدى البعيد ؟	نعم	لا
D15	هل تعتقد ان البال جاب يساعد في تحسين خواص التربة ؟	نعم	لا
D16	هل تعتقد ان البال جاب سيزيد من جودة المنتج الفلسطيني ؟	نعم	لا
D17	هل تعتقد ان البال جاب ستزيد من الربحية ؟	نعم	لا
D18	هل توافق بان يكون حصولك على شهادة البال جاب الزامية للتصدير الى الاسواق المحلية والإقليمية ؟	نعم	لا

قياس مدى الاهتمام بموضوع البال جاب: (E)						
الرقم	**السؤال (ما هي اهم فوائد البال جاب التي ممكن ان يوفرها)**	**ضع اشارة حول الاجابة**				
E1	الممارسات الزراعية الجيدة الفلسطينية البال جاب معروفة لديك .	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده
E2	تستطيع التمييز بين الممارسات الزراعية الجيدة " البال حاب " والممارسات الزراعية التقليدية.	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده
E3	تستطيع التمييز بين الممارسات الزراعية الجيدة " البال حاب " والممارسات الزراعية الأمنه .	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده
E4	استخدام البال جاب يمكن ان يساعد في زيادة الامن الغذائي .	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده

E5	تطبيق شروط الحصول على شهادة البال جاب يمكن ان تكون صعبة التطبيق .	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده
E6	تطبيق شروط الحصول على شهادة البال جاب يمكن ان تكون مكلفه ماديا .	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده
E7	حصولك على شهادة البال جاب تخفض من تكاليف الانتاج على المدى البعيد ؟	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده
E8	تحتاج الى تدريب نظري لزيادة المعرفة في نظام البال جاب	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده
E9	ستشارك في فرصة تدريب لزيادة المعرفة في نظام البال جاب	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده
E10	تعتقد ان درجة وعي المستهلك لحصوله على منتج زراعي امن ممكن ان يزيد من اهتمامك في الحصول على شهادة البال جاب	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده

قياس مرحلة تقييم الممارسات الزراعية الجيدة " البال جاب ": (F)						
الرقم	**السؤال (ما هي اهم فوائد البال جاب التي ممكن ان يوفرها)**	**ضع اشارة حول الاجابة**				
F1	استخدام نظام البال جاب ممكن ان يزيد من كفاءة استخدام الموارد الطبيعية مثل الماء .	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده
F2	استخدام نظام البال جاب ممكن ان يزيد من كفاءة استخدام الموارد الطبيعية مثل التربة .	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده
F3	استخدام نظام البال جاب ممكن ان يزيد من كفاءة استخدام الاسمدة العضوية .	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده
F4	استخدام نظام البال جاب ممكن ان يزيد من كفاءة استخدام نظام المكافحة المتكاملة .	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده

F5	استخدام نظام البال جاب ممكن ان يقلل من استخدام المبيدات الحشرية والفطرية والكيماويات الزراعية .	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده
F6	استخدام نظام البال جاب ممكن ان يزيد من تحسين جودة المنتج الزراعي وسلامه الغذاء .	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده
F7	استخدام نظام البال جاب ممكن ان يزيد من انتاجية المحصول .	اوافق بشدة	اوافق	محايد	اعارض	اعارض بشده

حفظ السجلات وعمليات التفتيش الذاتي الداخلية: (H)			
الرقم	**السؤال**	**ضع اشارة حول الاجابة**	
H1	هل تقوم بحفظ السجلات الزراعية ؟	نعم	لا
H2	هل تتضمن السجلات كمية الانتاج ؟	نعم	لا
H3	هل تتضمن السجلات اوامر الشراء" الفواتير" الخاصة بشراء مواد ادخال المنتجات ؟	نعم	لا
H4	هل تتضمن السجلات تفاصيل بيع المنتج الزراعي الناتج بالكميات المباعة واسعارها؟	نعم	لا
H5	هل توضح السجلات أسماء العاملين في المزرعة والمهام الذين يقومون بها ؟	نعم	لا
H6	هل توضح السجلات خبرة ومهارة وكفاءة العامليين والتدريبات التي تلقوها ؟	نعم	لا
H7	هل تم إنشاء نظام للتسجيل خاص لكل وحدة إنتاجية ؟	نعم	لا
H8	هل يرعى في تخطيط المزرعة لمواقع الإنتاج صحة العمال، البيئة، سلامة الغذاء، صحة الحيوانات ؟	نعم	لا
H9	هل يوجد خطة عمل توضح الاستراتيجيات لتقليل المخاطر من تلوث المياه او الملوثات الأخرى ؟	نعم	لا
H10	هل هناك نظام فعال معمول به لتحديد وفصل جميع المنتجات المعتمدة وغير المعتمدة للممارسات الزراعية الجيدة.	نعم	لا

الممارسات الزراعية الجيدة التي يقوم بها المزارع في المزرعة: (I)			
الرقم	السؤال	ضع اشارة حول الاجابة	
جودة وصحة النبات :			
I 1	هل يوجد وثائق تثبت الاصناف والانواع المزروعة " مثل عبوات البذار الفارغة، سجلات الشحن، قائمة التعبئة، الفاتورة ....." والتي تحدد اسم الصنف ورقم تمييز المنتج على العبوة.	نعم	لا
I 2	هل يوجد نظام موثق لمراقبة الجودة يتضمن الرقابة على الآفات والامراض والعلامات الظاهرة للأضرار الناتجة.	نعم	لا
I 3	هل يراعى عند ما بعد الحصاد : (نقل المحصول الاجراءات الوقائية للحد من الملوثات الميكروبية والكيميائية والفيزيائية للأمراض).	نعم	لا
I 4	هل يتوفر اماكن نظيفة لتخزين المنتج المعبأ بحيث تحفظه من التلوث .	نعم	لا
I 5	هل يتم الفصل بين المنتجات من البال جاب والمنتجات التقليدية.		
ادارة التربة وحمايتها:			
I 5	هل يتم فحص خواص التربة قبل زراعة المحصول ومعرفة احتياجاته.	نعم	لا
I 6	هل يقوم المزارع او المهندس الزراعي بحساب الاحتياجات الغذائية للمحصول المراد زراعته بناء على نتائج تحليل التربة.	نعم	لا
I 7	هل يقوم المزارع بإجراء الدورات الزراعية للمحاصيل لتحسين خواص التربة	نعم	لا
I 8	هل يتم استخدام تقنيات تمنع التربة من الانجراف مثل (استخدام الملش، زراعة اشجار ،عمل سناسل ....) ؟	نعم	لا
ادارة السماد:			
I 9	هل لدى المزارع الخبرة الكافية في استخدام الأسمدة (العضوي او غير العضوي) ؟	نعم	لا
I 10	هل يتلقى المزارع ارشادات خارجية لاستخدام الأسمدة (العضوي وغير العضوي) ؟	نعم	لا

I 11	هل يوجد سجل للأسمدة يتم تحديثه باستمرار (يثبت حجم المخزون الحالي من السماد في المزرعة " الفرق بين الاسمدة المشتراة والمستخدمة) ؟	نعم	لا
I 12	هل يتم تخزين الاسمدة في مكان منفصل عن تخزين المبيدات وغيرها لمنع التلوث الغير مقصود من خلال استخدام اغطية او حائط .... الخ .؟	نعم	لا
I 13	هل يتم تسجيل التفاصيل الخاصة بأنواع السماد والجرعات المستخدمة في كل محصول في المزارعة مثل ؟ " كمية ونوع السماد ، طريقة وموعد المعاملة ، اسم العامل ...الخ	نعم	لا
ادارة المياه:			
I 14	هل يتم استخدام ادوات لحساب احتياجات المحصول من مياه الري مثل جهاز التنشوميتر ؟	نعم	لا
I 15	هل يتم استخدام مياه العادمة المعالجة في ري المزروعات ؟	نعم	لا
I 16	هل يتم مراعاة المخاطر الناجمة عن تلوث المياه بشكل عام : (بالمواد الفيزيائية او الكيميائية او البيولوجية اثناء استخدام المياه في ري او تسميد المحاصيل) ؟	نعم	لا
I 17	هل يتم تحليل وفحص المياه المستخدمة في ري المحاصيل مرة واحدة في السنة ؟	نعم	لا
I 18	في حالة فحص وتحليل المياه. هل يتم عمل الفحص في مختبرات معتمدة او مختبرات حاصلة على شهادة ISO او ما يماثلها ؟	نعم	لا
I 19	هل توجد سجلات توثق كمية المياه المستخدمة وجدول يوثق توزيع المياه المستخدمة في ري المحصول والمصاريف " سجل الري " ؟	نعم	لا
الادارة المتكاملة للآفات:			
I 20	هل تلقى المزارع ارشادات او تدريب على الادارة المتكاملة للآفات ؟	نعم	لا
I 21	هل يتم الاستعانة بالمهندسين الزراعيين في تشخيص الآفات وطرق مكافحتها ؟		
I 22	هل قام المزارع بتنفيذ نشاط تبنى الممارسات الإنتاجية التي تحد من الاصابة وكثافتها وبالتالي الحد من التدخل الكيميائي مثل الشبك او التقليم ؟	نعم	لا
I 23	هل قام المزارع بتسجيل وتحديد ظهور الافة والاعداء الحيوية ودرجة تكاثرها ؟	نعم	لا
I 24	هل تراعي كمية المبيد المسموح بها لمكافحة الافه والفترة المسموحة لدخول الحقل بعد الرش.	نعم	لا

I 25	هل تراعي فترة الامان للمبيد عند حصاد المحصول الزراعي .	نعم	لا
I 26	هل لديك المعرفة بالمبيدات المسموح في تداولها ، والمصرح في استخدامه في بلد المنشأ فلسطين	نعم	لا
I 27	هل يتم توثيق جميع الانشطة المتعلقة بالمعاملات الخاصة ببرنامج المكافحة المتكاملة: مثل (اسم المبيد ، موعد وكمية الرش على كل محصول ...) .	نعم	لا

صحة وسلامة ورفاهية العاملين: (تقييم المخاطر): (J)			
الرقم	**السؤال**	**ضع اشارة حول الاجابة**	
J1	هل تلقى العامليين تدريبات حول السلامة الصحية :(التعامل مع المواد الكيميائية والمطهرات والمبيدات .....) ؟	نعم	لا
J2	هل يوجد في المزرعة شخص واحد على الاقل مدرب على الاسعافات الاولية ؟	نعم	لا
J3	هل يتوفر في المزرعة مواد وادوات الاسعافات الاولية، وهل هي متاحة للاستخدام لجميع العامليين ؟	نعم	لا
J4	هل لدى المزرعة تعليمات موثقة ومعروضة للنظافة الشخصية والصحة العامة ؟	نعم	لا
J5	هل يتم تطبيق اجراءات النظافة الشخصية والصحة العامة للعاملين في المزرعة ؟	نعم	لا
J6	هل تعرض احد من العاملين او افراد اسرتك لتسمم بسبب رش المبيدات ؟	نعم	لا
J7	اذا كنت تملك حيوانات في المزرعة ، هل تعرضت حيوانات المزرعة الى تسمم وامراض بسبب رش المبيدات او الملوثات ؟	نعم	لا
J8	هل يتم تحديد مواقع الخطر بعلامات تحذيرية وموضوعة في اماكن مناسبة ؟	نعم	لا
J9	هل يتم عقد اجتماعات منظمة بين الإدارة والعاملين، هل يتم توثيق هذه الاجتماعات في السجلات ويناقش فيها صحة وسلامه العاملين ؟	نعم	لا

J10	هل أماكن سكن العمال في المزرعة صالحة للسكن ومتوفر فيها الاحتياجات الأساسية من ماء وكهرباء ودورات مياه ؟	نعم	لا

ادارة الملوثات والنفايات وحماية البيئة: (K)			
الرقم	**السؤال**	**ضع اشارة حول الاجابة**	
K1	هل يتم عمل قائمة تحدد النفايات ومصادر التلوث الناتجة عن العمليات التشغيلية داخل المزرعة ؟ النفايات مثل: ورق، كرتون، بلاستك، زيوت..... الخ) ؟	نعم	لا
K2	هل يتم عمل قائمة تحدد مصادر التلوث الناتجة عن العمليات التشغيلية داخل المزرعة ؟ مصادر التلوث مثل: التسميد الزائد، الوقود، الزيوت، المواد الكيميائية، الضوضاء، مخلفات حيوانات..... الخ) ؟	نعم	لا
K3	هل يوجد خطة موثقة لإدارة النفايات لمنع او تقليل الملوثات واعادة تدوير النفايات ؟	نعم	لا
K4	هل يتم تصنيع السماد (الكمبوست) من المخلفات العضوية والاستفادة منها في تحسن خواص التربة ؟	نعم	لا
K5	هل المزرعة والاماكن التابعة لها نظيفة من النفايات بحيث تمنع توفر مكان لتكاثر الحشرات من الامراض والتي تؤثر على سلامة الغذاء ؟	نعم	لا
K6	هل يتوفر في المزرعة اماكن محددة لتخزين الاوراق والنفايات ؟	نعم	لا
K7	هل يتم تحديد انواع المخلفات وتخزين كل منها على حده ؟	نعم	لا
K8	هل يوجد لكل منتج خطة عمل لحماية وإدارة الحياة البرية لتخفيف اثأر النشاط الزراعي على البيئة ؟	نعم	لا
K9	اذا وجد : هل تتوافق خطة حماية البيئة مع متطلبات الزراعة المستدامة وتوضح التقليل من اثار الزراعة على البيئة ؟	نعم	لا
K10	هل تتضمن الخطة الخطوط الاساسية لحماية التنوع النباتي والحيواني " التنوع الحيوي "؟	نعم	لا
K11	هل تتضمن الخطة نشاط لمنع تلف وتدهور الحياه البرية في المزرعة ؟	نعم	لا

K12	هل تم المشاركة بعمل مجتمعي لعمل أنشطة تدعم البيئة وتحسين جودة البيئة وعناصرها ؟	نعم	لا

قياس مدى تبني موضوع البال جاب: (G)			
الرقم	**السؤال**	**ضع اشارة حول الاجابة**	
G1	هل تعتقد ان تبني الحصول على شهادة البال جاب مكلفة ماديا .	نعم	لا
G2	هل تعتقد ان الحصول على شهادة البال جاب صعبة من حيث تطبيق الممارسات الزراعية الجيدة التي تتطلبها للحصول على الشهادة .	نعم	لا
G3	هل تعتقد ان تبني الحصول على شهادة البال جاب تخالف العادات والممارسات الزراعية التي تمارسها .	نعم	لا
G4	هل تجد صعوبة في تغيير النمط الزراعي التقليدي الذي تمارسه في زراعة المحاصيل.	نعم	لا
G5	هل تحتاج الى الاطلاع على تجارب مزارعين اخرين لتبني نظام البال جاب	نعم	لا
G6	هل تعتقد انك بحاجة الى دعم مادي لتطبيق الممارسات الزراعية الجيدة " نظام البال جاب .	نعم	لا
G7	هل تعتقد ان تبني نظام البال جاب ممكن ان يفتح لك فرص تسويقية كبيرة .	نعم	لا

Appendix B

Frequencies, percentages, averages, deviations, ranks, and the good agricultural practices that the farmer does in the farm among a sample of farmers in northern Palestine at the overall level and items

Num	Indicators and agricultural practices	Response				M	SD	Rang	Degree
		Yes		No					
		Fre	%	Fre	%				
I4	Owning a clean place to store the packaged product to protect it from contamination	222	76.3	69	23.7	0.76	0.43	1	high
I3	the preventive measures taken post-harvest (for example transporting the crop, protection procedures to reduce microbial, chemical and physical contaminants of diseases	191	65.6	100	34.4	0.66	0.48	2	middle
I1	Having documents proving the varieties and types grown (such as empty seed packages, shipping records, packing list, invoice, etc.) that	180	61.9	111	38.1	0.62	0.49	3	middle

	specify the name of the variety and the product identification number on the package								
I5	Traditional products separated from pal gap products	155	53.3	136	46.7	0.53	0.50	4	middle
I2	Having a documented quality control system that includes monitoring for pests, diseases and visible signs of damage	146	50.2	145	49.8	0.50	0.50	5	middle
overall level of plant quality and health						**0.61**	**0.35**	**middle**	
I8	crop rotations to improve soil properties performed by farmer	198	68.0	93	32.0	0.68	0.47	1	high
I9	techniques used to prevent soil erosion such as (using mulch, planting trees, making chains, etc.)	191	65.6	100	34.4	0.66	0.48	2	middle
I7	Calculating the nutritional needs of the crop to be grown based on the results of soil analysis by the	172	59.1	119	40.9	0.59	0.49	3	middle

	farmer or agriculture engineer								
I6	soil properties examined before planting the crop and its needs determined	148	50.9	143	49.1	0.51	0.50	4	middle
overall level of soil management and protection						**0.61**	**0.37**	**middle**	
I13	fertilizers stored in a separate place from pesticides and others to prevent unintended contamination using covers or walls, etc.	224	77.0	67	23.0	0.77	0.42	1	high
I10	having enough experience in using fertilizers (organic or inorganic) by farmer	213	73.2	78	26.8	0.73	0.44	2	high
I11	receive external guidance on the use of fertilizers (organic and inorganic) by farmer	194	66.7	97	33.3	0.67	0.47	3	middle
I14	details of fertilizer types and doses used for each crop recorded in the farm, such as? "Quantity and type of fertilizer, method and date of treatment, name of worker...etc.	160	55.0	131	45.0	0.55	0.50	4	middle

I12	Having a fertilizer register that is constantly updated (proving the current stock of fertilizer on the farm "the difference between fertilizer purchased and used")	144	49.5	147	50.5	0.49	0.50	5	middle
overall level of fertilizer management						**0.64**	**0.35**	**middle**	
I17	the risks resulting from water pollution in general (physical, chemical or biological substances) considered when using water to irrigate or fertilize crops	191	65.6	100	34.4	0.66	0.48	1	middle
I20	Having documenting records for the amount of water used and a table documenting the distribution of water used in irrigating the crop and expenses ("irrigation record")	158	54.3	133	45.7	0.54	0.50	2	middle
I18	using water for irrigating crops analyzed and tested once a year	133	45.7	158	54.3	0.46	0.50	3	middle

I19	Water testing and analysis, is testing done in accredited laboratories or laboratories that have obtained ISO certification or equivalent	125	43.0	166	57.0	0.43	0.50	4	middle
I15	calculate the crop's irrigation for water requirements by using tools, such as a tensiometer	118	40.5	173	59.5	0.41	0.49	5	middle
I16	wastewater used for irrigation of crops Is treated	90	30.9	201	69.1	0.31	0.46	6	low
overall level of water management						**0.47**	**0.38**	**middle**	
I26	consider the pesticide safety period when harvesting the crop	252	86.6	39	13.4	0.87	0.34	1	high
I25	consider the amount of pesticide allowed to control the pest and the period allowed to enter the field after spraying	233	80.1	58	19.9	0.80	0.40	2	high
I22	Agricultural engineers help in	231	79.4	60	20.6	0.79	0.41	3	high

	diagnose pests and control them								
I27	having knowledge about the pesticides that are allowed to be traded and approved for use in the country of origin, Palestine	205	70.4	86	29.6	0.70	0.46	4	high
I23	implemented an activity to adopt productive practices that reduce infection and its intensity and thus reduce chemical intervention by farmer such as netting or pruning	179	61.5	112	38.5	0.62	0.49	5	middle
I28	all activities related to the transactions of the integrated pest management program documented: such as (name of pesticide, date and amount of spraying on each crop)	177	60.8	114	39.2	0.61	0.49	6	middle
I21	receiving guidance or training on integrated pest management by farmer	166	57.0	125	43.0	0.57	0.50	7	middle

I24	Record and identify the occurrence of the pest, its natural enemies and the degree of its reproduction by farmer	146	50.2	145	49.8	0.50	0.50	8	middle
overall level of integrated pest management						**0.68**	**0.31**	**High**	
0-0.33 low, above 0.33-0.67 middle, above 0.67-1 high									

Appendix C

Means and deviations and the use of the T-Test and the One Way ANOVA test to examine the significance of the differences in the level of knowledge of the concept of PAL-GAP among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.

Variable (D)	cat	M(SD)	Test T/F p-value
Governorate	Nablus	0.64(0.23)	12.862*** *p*=0.000
	Tulkarm	0.79(0.22)	
	Jenin	0.70(0.24)	
Gender	Male	0.71(0.24)	0.704 *p*=0.482
	Female	0.68(0.22)	
Age	18-24y	0.69(0.27)	1.156 *p*=0.331
	25-29 y	0.73(0.22)	
	30-39 y	0.70(0.23)	
	40-49 y	0.74(0.23)	
	50-59 y	0.68(0.24)	
	60 or more	0.62(0.30)	
marital status	bachelor	0.75(0.24)	0.812 *p*=0.445
	married	0.70(0.24)	
	others	0.69(0.27)	
	1-3	0.72(0.21)	2.104 *p*=0.100
	4-5	0.74(0.23)	

Variable	cat	M(SD)	Test T/F p-value
Number of family members currently working	0-2	0.71(0.23)	1.830 *p*=0.162
	3-5	0.72(0.24)	
	6-8	0.60(0.33)	
Support	No	0.66(0.25)	-4.833*** *p*=0.000
	Yes	0.80(0.19)	
Types of agricultural holding:	owner	0.72(0.24)	1.463 *p*=0.225
	Rented	0.64(0.23)	
	guarantee	0.71(0.25)	
	parental	0.67(0.23)	
Type of holding	plants	0.72(0.24)	2.486* *p*=0.013
	Mixed	0.59(0.18)	
Total cultivated land area	0-2	0.72(0.22)	0.396 *p*=0.756
	3-4	0.71(0.24)	
	5-10	0.71(0.26)	
	More 10	0.67(0.25)	
	0-2	0.70(0.21)	0.224

Number of family members	6-8	0.67(0.26)	
	9 or more	0.61(0.22)	
Place of residence	city	0.74(0.18)	0.591
	village	0.70(0.24)	*p*=0.555
Educational qualification	Secondary	0.68(0.26)	
	diploma	0.71(0.22)	2.382
	Bachelor	0.76(0.21)	*p*=0.070
	Postgraduate	0.65(0.24)	
Income level	Less 2000	0.61(0.22)	9.229***
	2000-4000	0.76(0.20)	*p*=0.000
	More 4000	0.68(0.30)	
His relationship with family support	Main	0.70(0.24)	0.128
	One of the	0.72(0.24)	*p*=0.880
	Other	0.69(0.26)	
Nature of work on the farm	Fulltime	0.70(0.25)	-0.576
	Part time	0.72(0.22)	*p*=0.565
Membership status in social institutions	Board Member	0.84(0.12)	11.887***
	Regular Member	0.77(0.24)	*p*=0.000
	Not subscribed	0.65(0.24)	

Total cultivated land area (irrigated)	3-4	0.71(0.25)	*p*=0.880
	5-10	0.72(0.25)	
	More 10	0.68(0.28)	
Cultivated land area (the exposed irrigated)	0-2	0.72(0.24)	
	3-4	0.67(0.22)	1.656
	5-10	0.62(0.21)	*p*=0.177
	More 10	0.64(0.30)	
Cultivated land area (irrigated in greenhouses)	0-less 0.5	0.57(0.21)	
	0.5-1	0.77(0.18)	13.796***
	More1-3	0.78(0.20)	*p*=0.000
	More3	0.68(0.29)	
Irrigated cultivated land area in low tunnels	0-less 0.5	0.69(0.24)	2.001
	0.5-1	0.74(0.20)	*p*=0.137
	Mo	0.79(0.24)	
Did you get your PAL gap certificate	No	0.68(0.23)	-6.926***
	Yes	0.97(0.06)	*p*=0.000

Appendix D

Means and deviations and the use of the T-Test and the One Way ANOVA test to examine the significance of the differences in the level of interest of the concept of PAL-GAP among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)

Vari(E)	cat	M(SD)	Test T/F p-value
Governorate	Nablus	3.79(0.59)	20.415*** *p*=0.000
	Tulkarm	4.24(0.51)	
	Jenin	3.81(0.57)	
Gender	Male	3.97(0.59)	1.417 *p*=0.158
	Female	3.81(0.60)	
Age	18-24y	4.15(0.62)	0983 *p*=0.429
	25-29 y	3.98(0.54)	
	30-39 y	3.94(0.60)	
	40-49 y	4.02(0.53)	
	50-59 y	3.87(0.58)	
	60 or more	3.80(0.87)	
marital status	bachelor	4.07(0.55)	1.673 *p*=0.190
	married	3.94(0.60)	
	others	3.58(0.22)	
Number of family	1-3	3.88(0.64)	1.886 *p*=0.132
	4-5	3.99(0.51)	

Vari	cat	M(SD)	Test T/F p-value
Number of family members currently working	0-2	3.96(0.58)	4.069* *p*=0.018
	3-5	4.00(0.57)	
	6-8	3.55(0.80)	
support	No	3.89(0.57)	-2.684** *p*=0.008
	Yes	4.09(0.63)	
Nature of agricultural holding:	owner	3.95(0.59)	2.200 *p*=0.088
	Rented	3.81(0.64)	
	guarantee	4.11(0.55)	
	parental	3.78(0.53)	
Type of holding	plants	3.96(0.60)	0.842 *p*=0.401
	Mixed	3.85(0.56)	
Total cultivated land area	0-2	3.98(0.49)	0.757 *p*=0.519
	3-4	3.93(0.66)	
	5-10	4.01(0.63)	
	More 10	3.84(0.56)	
	0-2	3.94(0.60)	1.083

members	6-8	3.92(0.64)	
	9 or more	4.40(0.45)	
Place of residence	city	4.04(0.63)	0.637
	village	3.95(0.59)	*p*=0.524
Eeducational qualification	Secondary	3.96(0.64)	
	diploma	3.95(0.57)	0.223
	Bachelor	3.96(0.51)	*p*=0.880
	Postgraduate	3.82(0.66)	
Income level	Less 2000	3.93(0.49)	2.523
	2000-4000	4.02(0.62)	*p*=0.082
	More 4000	3.83(0.59)	
His relationship with family suppor	Main	3.97(0.60)	
	One of the	3.88(0.58)	0.547
	Other	4.05(0.45)	*p*=0.580
Nature of work on the farm	Total	3.99(0.61)	1.401
	Part time	3.88(0.54)	*p*=0.162
Membership status in social institutions	Board Member	4.20(0.52)	
	Regular Member	4.08(0.58)	7.293***
	Not subscribed	3.85(0.59)	*p*=0.001

Total cultivated land area (irrigated)	3-4	3.95(0.54)	*p*=0.357
	5-10	4.04(0.65)	
	More 10	3.81(0.59)	
Cultivated land area (the exposed irrigated)	0-2	3.95(0.59)	0.781
	3-4	4.06(0.60)	*p*=0.505
	5-10	3.97(0.57)	
	More 10	3.78(0.66)	
Cultivated land area (irrigated in greenhouses)	0-less 0.5	3.83(0.67)	
	0.5-1	4.00(0.52)	3.143*
	More1-3	4.08(0.53)	*p*=0.026
	More3	3.86(0.62)	
irrigated cultivated land area in low tunnels	0-less 0.5	3.92(0.59)	
	0.5-1	4.15(0.59)	3.220*
	More1	4.17(0.54)	*p*=0.041
Did you get your pal gap certificate	No	3.89(0.58)	-5.360***
	Yes	4.48(0.42)	*p*=0.000

Appendix E

Means and deviations and the use of the T-Test and the One Way ANOVA test to examine the significance of the Measurement of the evaluation stage of good agricultural practices PAL GAP :(among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)

Vari(F)	cat	M(SD)	Test T/F p-value
Governorate	Nablus	4.01(0.66)	3.984* *p*=0.000
	Tulkarm	4.24(0.60)	
	Jenin	4.06(0.50)	
Gender	Male	4.12(0.62)	1.372 *p*=0.171
	Female	3.96(0.52)	
Age	18-24y	4.10(0.44)	2.412* *p*=0.037
	25-29 y	4.12(0.55)	
	30-39 y	3.90(0.61)	
	40-49 y	4.19(0.61)	
	50-59 y	4.21(0.60)	
	60 or more	4.12(0.72)	
marital status	bachelor	4.20(0.55)	0.663 *p*=0.516
	married	4.09(0.62)	
	others	3.96(0.70)	
Number of family members	1-3	4.01(0.62)	0.821 *p*=0.483
	4-5	4.12(0.59)	
	6-8	4.13(0.63)	

Vari	cat	M(SD)	Test T/F p-value
Number of family members currently working	0-2	4.11(0.55)	0.125 *p*=0.882
	3-5	4.07(0.69)	
	6-8	4.11(0.73)	
support	No	4.09(0.59)	-0.335 *p*=0.738
	Yes	4.12(0.66)	
Nature of agricultural holding:	owner	4.09(0.63)	0.570 *p*=0.635
	Rented	4.05(0.59)	
	guarantee	4.19(0.53)	
	parental	4.21(0.72)	
Type of holding	plants	4.13(0.59)	2.641** *p*=0.009
	Mixed	3.78(0.75)	
Total cultivated land area	0-2	4.22(0.53)	2.339 *p*=0.074
	3-4	4.13(0.63)	
	5-10	3.99(0.64)	
	More 10	4.01(0.63)	
	0-2	4.16(0.55)	1.489 *p*=0.218
	3-4	4.14(0.62)	

	9 or more	4.27(0.41)	
Place of residence	city	4.18(0.54)	0.574 *p*=0.567
	village	4.10(0.61)	
Eeducational qualification	Secondary	4.11(0.63)	0.610 *p*=0.609
	diploma	4.18(0.69)	
	Bachelor	4.04(0.56)	
	Postgraduate	4.05(0.27)	
Income level	Less 2000	4.08(0.56)	0.407 *p*=0.666
	2000-4000	4.08(0.65)	
	More 4000	4.16(0.57)	
His relationship with family suppor	Main	4.10(0.62)	0.070 *p*=0.932
	One of the	4.11(0.59)	
	Other	4.21(0.43)	
Nature of work on the farm	Total	4.08(0.61)	-0.733 *p*=0.464
	Part time	4.14(0.60)	
Membership status in social institutions	Board Member	4.23(0.49)	0.893 *p*=0.411
	Regular Member	4.13(0.64)	
	Not subscribed	4.07(0.61)	

Total cultivated land area (irrigated)	5-10	3.99(0.65)	
	More 10	4.00(0.64)	
Cultivated land area (the exposed irrigated)	0-2	4.10(0.63)	0.420 *p*=0.739
	3-4	4.16(0.49)	
	5-10	4.16(0.52)	
	More 10	3.97(0.66)	
Cultivated land area (irrigated in greenhouses)	0-less 0.5	4.15(0.54)	3.854* *p*=0.010
	0.5-1	4.24(0.62)	
	More1-3	4.15(0.62)	
	More3	3.91(0.62)	
irrigated cultivated land area in low tunnels	0-less 0.5	4.10(0.59)	1.458 *p*=0.234
	0.5-1	4.31(0.69)	
	More1	4.00(0.74)	
Did you get your pal gap certificate	No	4.10(0.62)	-0.087 *p*=0.931
	Yes	4.11(0.57)	

Appendix F

Means and deviations and the use of the T-Test and the One Way ANOVA test to examine the significance of the differences in the common practices for record keeping and internal self- inspection on the farm among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)

Vari(H)	cat	M(SD)	Test T/F p-value
Governorate	Nablus	0.37(0.37)	41.700*** *p*=0.000
	Tulkarm	0.80(0.31)	
	Jenin	0.61(0.33)	
Gender	Male	0.57(0.40)	-0.834 *p*=0.405
	Female	0.63(0.30)	
Age	18-24y	0.60(0.44)	0.613 *p*=0.690
	25-29 y	0.58(0.33)	
	30-39 y	0.54(0.41)	
	40-49 y	0.63(0.38)	
	50-59 y	0.54(0.40)	
	60 or more	0.59(0.33)	
marital status	bachelor	0.57(0.41)	0.080 *p*=0.923
	married	0.58(0.39)	
	others	0.65(0.40)	
Number of family members	1-3	0.41(0.41)	7.594*** *p*=0.000
	4-5	0.66(0.38)	
	6-8	0.57(0.36)	
	9 or more	0.87(0.19)	
Place of residence	city	0.69(0.36)	1.281 *p*=0.201
	village	0.57(0.39)	

Vari	cat	M(SD)	Test T/F p-value
Number of family members currently working	0-2	0.57(0.38)	0.236 *p*=0.790
	3-5	0.59(0.40)	
	6-8	0.63(0.33)	
support	No	0.47(0.39)	-7.432*** *p*=0.000
	Yes	0.81(0.27)	
Nature of agricultural holding:	owner	0.55(0.40)	3.976** *p*=0.008
	Rented	0.54(0.36)	
	guarantee	0.76(0.32)	
	parental	0.48(0.40)	
Type of holding	plants	0.57(0.39)	-0.685 *p*=0.494
	Mixed	0.63(0.29)	
Total cultivated land area	0-2	0.63(0.39)	1.613 *p*=0.187
	3-4	0.54(0.40)	
	5-10	0.53(0.40)	
	More 10	0.64(0.34)	
Total cultivated land area (irrigated)	0-2	0.63(0.38)	1.529 *p*=0.207
	3-4	0.52(0.39)	
	5-10	0.56(0.40)	
	More 10	0.64(0.36)	
Cultivated land area (the	0-2	0.59(0.40)	0.320 *p*=0.811

Eeducational qualification	Secondary	0.59(0.39)	0.617 *p*=0.605
	diploma	0.53(0.42)	
	Bachelor	0.61(0.38)	
	Postgraduate	0.49(0.29)	
Income level	Less 2000	0.56(0.38)	0.147 *p*=0.864
	2000-4000	0.59(0.39)	
	More 4000	0.57(0.39)	
His relationship with family suppor	Main	0.58(0.39)	2.245 *p*=0.108
	One of the	0.55(0.37)	
	Other	0.98(0.05)	
Nature of work on the farm	Total	0.58(0.40)	0.044 *p*=0.965
	Part time	0.58(0.36)	
Membership status in social institutions	Board Member	0.81(0.29)	13.392*** *p*=0.000
	Regular Member	0.68(0.36)	
	Not subscribed	0.49(0.39)	
exposed irrigated)	3-4	0.52(0.36)	
	5-10	0.53(0.38)	
	More 10	0.58(0.34)	
Cultivated land area (irrigated in greenhouses)	0-less 0.5	0.51(0.35)	6.006** *p*=0.001
	0.5-1	0.75(0.29)	
	More1-3	0.61(0.41)	
	More3	0.48(0.40)	
irrigated cultivated land area in low tunnels	0-less 0.5	0.54(0.40)	7.433** *p*=0.001
	0.5-1	0.82(0.19)	
	More1	0.74(0.26)	
Did you get your pal gap certificate	No	0.54(0.39)	-5.122*** *p*=0.000
	Yes	0.91(0.20)	

Appendix G

Means and deviations and the use of the T-Test and the One Way ANOVA test to examine the significance of the differences in the good agricultural practices that the farmer does in the farm among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)

Vari(I)	cat	M(SD)	Test T/F p-value
Governorate	Nablus	0.43(0.27)	56.202*** *p*=0.000
	Tulkarm	0.81(0.26)	
	Jenin	0.61(0.25)	
Gender	Male	0.60(0.32)	-0.939 *p*=0.348
	Female	0.66(0.26)	
Age	18-24y	0.63(0.35)	0.987 *p*=0.426
	25-29 y	0.63(0.28)	
	30-39 y	0.58(0.31)	
	40-49 y	0.66(0.29)	
	50-59 y	0.56(0.33)	
	60 or more	0.59(0.34)	
marital status	bachelor	0.64(0.33)	0.216 *p*=0.806
	married	0.60(0.31)	
	others	0.59(0.22)	
Number of family members	1-3	0.47(0.30)	6.200*** *p*=0.000
	4-5	0.65(0.31)	
	6-8	0.63(0.29)	
	9 or more	0.81(0.25)	

Vari	cat	M(SD)	Test T/F p-value
Number of family members currently working	0-2	0.60(0.30)	0.064 *p*=0.938
	3-5	0.61(0.34)	
	6-8	0.62(0.27)	
support	No	0.53(0.30)	-6.526*** *p*=0.000
	Yes	0.77(0.26)	
Nature of agricultural holding:	owner	0.59(0.31)	4.795** *p*=0.003
	Rented	0.54(0.31)	
	guarantee	0.76(0.27)	
	parental	0.54(0.25)	
Type of holding	plants	0.61(0.31)	0.704 *p*=0.482
	Mixed	0.56(0.28)	
Total cultivated land area	0-2	0.65(0.30)	2.268 *p*=0.081
	3-4	0.56(0.33)	
	5-10	0.58(0.31)	
	More 10	0.68(0.26)	
Total cultivated land area (irrigated)	0-2	0.64(0.29)	2.164 *p*=0.092
	3-4	0.54(0.32)	
	5-10	0.62(0.32)	

Place of residence	city	0.66(0.34)	0.698
	village	0.60(0.31)	*p*=0.486
Eeducational qualification	Secondary	0.60(0.31)	1.251
	diploma	0.58(0.34)	
	Bachelor	0.65(0.31)	*p*=0.291
	Postgraduate	0.48(0.20)	
Income level	Less 2000	0.55(0.28)	1.728
	2000-4000	0.63(0.31)	*p*=0.179
	More 4000	0.59(0.32)	
His relationship with family suppor	Main	0.61(0.31)	1.078
	One of the	0.60(0.30)	*p*=0.342
	Other	0.83(0.12)	
Nature of work on the farm	Total	0.62(0.31)	0.996
	Part time	0.58(0.30)	*p*=0.320
Membership status in social institutions	Board Member	0.78(0.26)	13.161***
	Regular Member	0.69(0.31)	*p*=0.000
	Not subscribed	0.53(0.30)	
	More 10	0.68(0.27)	
Cultivated land area (the exposed irrigated)	0-2	0.61(0.32)	0.490
	3-4	0.55(0.28)	*p*=0.689
	5-10	0.63(0.29)	
	More 10	0.67(0.26)	
Cultivated land area (irrigated in greenhouses)	0-less 0.5	0.54(0.26)	4.795**
	0.5-1	0.72(0.28)	*p*=0.007
	More1-3	0.63(0.33)	
	More3	0.55(0.33)	
irrigated cultivated land area in low tunnels	0-less 0.5	0.58(0.31)	6.442**
	0.5-1	0.68(0.26)	*p*=0.002
	More1	0.80(0.24)	
Did you get your pal gap certificate	No	0.58(0.31)	-4.825***
	Yes	0.86(0.22)	*p*=0.000

Appendix H

Means and deviations and the use of the T-Test and the One Way ANOVA test to examine the significance of the differences in the level of health, safety and luxury of workers(Risk Assessment) : among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)

Vari(J)	cat	M(SD)	Test T/F p-value
Governorate	Nablus	0.36(0.26)	33.369*** *p*=0.000
	Tulkarm	0.69(0.35)	
	Jenin	0.46(0.27)	
Gender	Male	0.49(0.33)	-0.908 *p*=0.365
	Female	0.55(0.26)	
Age	18-24y	0.55(0.40)	0.813 *p*=0.541
	25-29 y	0.53(0.31)	
	30-39 y	0.47(0.31)	
	40-49 y	0.54(0.33)	
	50-59 y	0.45(0.33)	
	60 or more	0.46(0.38)	
marital status	bachelor	0.59(0.32)	2.127 *p*=0.121
	married	0.49(0.33)	
	others	0.33(0.30)	
	1-3	0.41(0.31)	3.107* *p*=0.027
	4-5	0.54(0.34)	

Vari	cat	M(SD)	Test T/F p-value
Number of family members currently working	0-2	0.48(0.32)	0.330 *p*=0.719
	3-5	0.51(0.33)	
	6-8	0.49(0.29)	
support	No	0.44(0.32)	-4.420*** *p*=0.000
	Yes	0.62(0.32)	
Nature of agricultural holding:	owner	0.49(0.33)	1.708 *p*=0.166
	Rented	0.48(0.34)	
	guarantee	0.59(0.32)	
	parental	0.38(0.27)	
Type of holding	plants	0.50(0.33)	-0.108 *p*=0.914
	Mixed	0.50(0.32)	
Total cultivated land area	0-2	0.52(0.33)	1.178 *p*=0.318
	3-4	0.46(0.34)	
	5-10	0.47(0.32)	
	More 10	0.56(0.30)	
	0-2	0.52(0.32)	1.584

Number of family members	6-8	0.49(0.32)	
	9 or more	0.69(0.20)	
Place of residence	city	0.51(0.34)	0.112
	village	0.50(0.33)	*p*=0.911
Eeducational qualification	Secondary	0.49(0.32)	2.547 *p*=0.056
	diploma	0.47(0.34)	
	Bachelor	0.55(0.34)	
	Postgraduate	0.29(0.22)	
Income level	Less 2000	0.44(0.28)	3.178* *p*=0.043
	2000-4000	0.54(0.33)	
	More 4000	0.450.35)	
His relationship with family support	Main	0.49(0.33)	0.501 *p*=0.607
	One of the	0.51(0.31)	
	Other	0.65(0.26)	
Nature of work on the farm	Total	0.51(0.33)	0.752 *p*=0.453
	Part time	0.48(0.32)	
	Board Member	0.66(0.31)	15.609*** *p*=0.000
	Regular Member	0.61(0.34)	
	Not subscribed	0.41(0.30)	

Total cultivated land area (irrigated)	3-4	0.44(0.33)	*p*=0.193
	5-10	0.51(0.34)	
	More 10	0.57(0.32)	
Cultivated land area (the exposed irrigated)	0-2	0.50(0.33)	0.699 *p*=0.553
	3-4	0.43(0.31)	
	5-10	0.47(0.33)	
	More 10	0.58(0.31)	
Cultivated land area (irrigated in greenhouses)	0-less 0.5	0.44(0.28)	2.317 *p*=0.076
	0.5-1	0.57(0.33)	
	More1-3	0.53(0.34)	
	More3	0.46(0.33)	
irrigated cultivated land area in low tunnels	0-less 0.5	0.47(0.33)	4.385* *p*=0.013
	0.5-1	0.58(0.33)	
	More1	0.66(0.30)	
Did you get your pal gap certificate	No	0.46(0.32)	-6.175*** *p*=0.000
	Yes	0.83(0.19)	

Appendix I

Means and deviations and the use of the T-Test and the One Way ANOVA test to examine the significance of the differences in the pollutant and management and environmental protection in the farm among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)

Vari(K)	cat	M(SD)	Test T/F p-value
Governorate	Nablus	0.29(0.31)	43.474*** *p*=0.000
	Tulkarm	0.71(0.37)	
	Jenin	0.48(0.33)	
Gender	Male	0.48(0.39)	-0.874 *p*=0.383
	Female	0.54(0.33)	
Age	18-24y	0.55(0.39)	0.568 *p*=0.724
	25-29 y	0.50(0.35)	
	30-39 y	0.45(0.39)	
	40-49 y	0.52(0.38)	
	50-59 y	0.44(0.38)	
	60 or more	0.52(0.41)	
marital status	bachelor	0.55(0.40)	2.348 *p*=0.097
	married	0.47(0.38)	
	others	0.81(0.17)	
Number of family members	1-3	0.31(0.36)	6.512*** *p*=0.000
	4-5	0.54(0.38)	
	6-8	0.52(0.37)	
	9 or more	0.73(0.26)	
Place of residence	city	0.49(0.41)	0.021

Vari	cat	M(SD)	Test T/F p-value
Number of family members currently working	0-2	0.48(0.38)	0.425 *p*=0.654
	3-5	0.45(0.39)	
	6-8	0.55(0.41)	
support	No	0.41(0.37)	-4.992*** *p*=0.000
	Yes	0.64(0.36)	
Nature of agricultural holding:	owner	0.47(0.39)	2.736* *p*=0.044
	Rented	0.44(0.35)	
	guarantee	0.61(0.38)	
	parental	0.32(0.32)	
Type of holding	plants	0.48(0.39)	-0.647 *p*=0.518
	Mixed	0.53(0.34)	
Total cultivated land area	0-2	0.53(0.38)	0.637 *p*=0.592
	3-4	0.46(0.39)	
	5-10	0.46(0.39)	
	More 10	0.50(0.36)	
Total cultivated land area (irrigated)	0-2	0.51(0.37)	0.807 *p*=0.491
	3-4	0.43(0.38)	
	5-10	0.50(0.40)	
	More 10	0.50(0.37)	

	village	0.48(0.38)	*p*=0.983
Eeducational qualification	Secondary	0.50(0.38)	1.529 *p*=0.207
	diploma	0.43(0.41)	
	Bachelor	0.52(0.38)	
	Postgraduate	0.31(0.31)	
Income level	Less 2000	0.42(0.32)	3.423* *p*=0.034
	2000-4000	0.54(0.40)	
	More 4000	0.42(0.38)	
His relationship with family suppor	Main	0.48(0.38)	0.990 *p*=0.373
	One of the	0.48(0.37)	
	Other	0.75(0.39)	
Nature of work on the farm	Total	0.49(0.38)	0.327 *p*=0.744
	Part time	0.47(0.38)	
Membership status in social institutions	Board Member	0.66(0.34)	10.466*** *p*=0.000
	Regular Member	0.58(0.39)	
	Not subscribed	0.40(0.36)	

Cultivated land area (the exposed irrigated)	0-2	0.49(0.39)	0.442 *p*=0.723
	3-4	0.40(0.37)	
	5-10	0.46(0.36)	
	More 10	0.51(0.36)	
Cultivated land area (irrigated in greenhouses)	0-less 0.5	0.42(0.32)	4.411** *p*=0.005
	0.5-1	0.61(0.37)	
	More1-3	0.52(0.41)	
	More3	0.40(0.38)	
irrigated cultivated land area in low tunnels	0-less 0.5	0.45(0.38)	7.182** *p*=0.001
	0.5-1	0.69(0.32)	
	More1	0.67(0.35)	
Did you get your pal gap certificate	No	0.45(0.38)	-4.754*** *p*=0.000
	Yes	0.79(0.27)	

Appendix J

Means and deviations and the use of the T-Test and the One Way ANOVA test to examine the significance of the differences in the measuring the extent adoption of the pal Gap among a sample of farmers in northern Palestine according to the variables (governorate, gender, age, social status, etc.)

Vari(G)	cat	M(SD)	Test T/F p-value
Governorate	Nablus	0.76(0.22)	2.097 *p*=0.125
	Tulkarm	0.73(0.28)	
	Jenin	0.68(0.25)	
Gender	Male	0.73(0.25)	0.256 *p*=0.798
	Female	0.72(0.28)	
Age	18-24y	0.82(0.19)	2.830* *p*=0.016
	25-29 y	0.73(0.23)	
	30-39 y	0.75(0.25)	
	40-49 y	0.66(0.27)	
	50-59 y	0.80(0.20)	
	60 or more	0.69(0.31)	
marital status	bachelor	0.73(0.24)	0.019 *p*=0.982
	married	0.73(0.25)	
	others	0.75(0.29)	
Number of family members	1-3	0.78(0.20)	1.498 *p*=0.215
	4-5	0.72(0.27)	
	6-8	0.70(0.27)	
	9 or more	0.82(0.16)	
Place of residence	city	0.75(0.21)	0.311 *p*=0.756
	village	0.73(0.25)	
Eeducational qualification	Secondary	0.71(0.26)	0.746 *p*=0.525
	diploma	0.76(0.25)	
	Bachelor	0.75(0.24)	
	Postgraduate	0.73(0.19)	
Income level	Less 2000	0.74(0.24)	0.126 *p*=0.882
	2000-4000	0.73(0.25)	
	More 4000	0.72(0.26)	

Vari	cat	M(SD)	Test T/F p-value
Number of family members currently working	0-2	0.72(0.24)	0.483 *p*=0.617
	3-5	0.75(0.26)	
	6-8	0.73(0.28)	
support	No	0.74(0.24)	0.888 *p*=0.375
	Yes	0.71(0.27)	
Nature of agricultural holding:	owner	0.74(0.24)	2.182 *p*=0.090
	Rented	0.77(0.24)	
	guarantee	0.65(0.32)	
	parental	0.80(0.19)	
Type of holding	plants	0.73(0.25)	-0.713 *p*=0.476
	Mixed	0.77(0.24)	
Total cultivated land area	0-2	0.75(0.21)	3.462* *p*=0.017
	3-4	0.77(0.25)	
	5-10	0.71(0.26)	
	More 10	0.62(0.29)	
Total cultivated land area (irrigated)	0-2	0.75(0.21)	3.054* *p*=0.029
	3-4	0.75(0.26)	
	5-10	0.73(0.26)	
	More 10	0.59(0.31)	
Cultivated land area (the exposed irrigated)	0-2	0.75(0.24)	4.413** *p*=0.005
	3-4	0.69(0.26)	
	5-10	0.72(0.23)	
	More 10	0.53(0.32)	
Cultivated land area (irrigated in greenhouses)	0-less 0.5	0.73(0.23)	0.313 *p*=0.816
	0.5-1	0.73(0.23)	
	More1-3	0.75(0.22)	
	More3	0.71(0.31)	

His relationship with family suppor	Main	0.72(0.26)	0.608 *p*=0.545
	One of the	0.76(0.23)	
	Other	0.71(0.20)	
Nature of work on the farm	Total	0.72(0.26)	-1.102 *p*=0.272
	Part time	0.75(0.23)	
Membership status in social institutions	Board Member	0.73(0.26)	2.645 *p*=0.073
	Regular Member	0.68(0.29)	
	Not subscribed	0.76(0.22)	

irrigated cultivated land area in low tunnels	0-less 0.5	0.74(0.24)	4.687* *p*=0.010
	0.5-1	0.71(0.27)	
	More1	0.58(0.31)	
Did you get your pal gap certificate	No	0.74(0.25)	1.340 *p*=0.181
	Yes	0.67(0.24)	

Appendix K

Table showing the differences between those who obtained the Bal Gap and those who did not according to the variables of knowledge, interest, evaluation, implementation of good agricultural practices, and adoption.

Variable	**Did you get your PAL gap certificate**	**M(SD)**	**T**	**P-value**
knowledge of the concept of PAL-GAP	No	0.68(0.23)	-6.926***	*p*=0.000
	Yes	0.97(0.06)		
interest of the concept of PAL-GAP	*No*	*3.89(0.58)*	*-5.360****	*p=0.000*
	Yes	*4.48(0.42)*		
evaluation stage of good agricultural practices PAL GAP	No	4.10(0.62)	-0.087	*p*=0.931
	Yes	4.11(0.57)		
common practices for record keeping and internal self- inspection	No	0.54(0.39)	-5.122***	*p=0.000*
	Yes	0.91(0.20)		
Good agricultural practices carried out by the farmer on the farm	No	0.58(0.31)	-4.825***	*p=0.000*
	Yes	0.86(0.22)		
Health, Safety and luxury of Workers: (Risk Assessment)	No	0.46(0.32)	-6.175***	*p*=0.000
	Yes	0.83(0.19)		
Pollutant and waste management and environmental protection	No	0.45(0.38)	-4.754***	*p*=0.000
	Yes	0.79(0.27)		
Measuring the extent of adoption of the pal Gap	No	0.74(0.25)	1.340	*p*=0.181
	Yes	0.67(0.24)		

جـامعـــة النجاح الوطنية

كليـــة الدراســـات العليـــا

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قدمت هذه الرسالة/الأطروحة استكمالا لمتطلبات الحصول على درجة الماجستير في الانتاج النباتي ، من كلية الدراسات العليا، في جامعة النجاح الوطنية، نابلس– فلسطين.

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الملخص

تُعدّ الزراعة في فلسطين عنصرًا أساسيًا في الحياة الوطنية والثقافية والاقتصادية والاجتماعية، حيث تسهم في خلق فرص عمل، زيادة الدخل، وتحقيق الأمن الغذائي لعدد كبير من الأسر. وتبرز أهمية ضمان سلامة الغذاء المتداول محليًا كقضية رئيسية لجميع المشاركين في سلسلة الإنتاج الزراعي، مما يفرض ضرورة اعتماد برامج حديثة محليًا ودوليًا لضمان خلو المنتجات الزراعية والغذائية من أي ملوثات كيميائية، مع تحقيق جودة عالية وإنتاج صديق للبيئة، تلبيةً لمتطلبات المستهلكين وحقهم في منتج آمن.

تهدف هذه الدراسة إلى فحص العوامل المؤثرة على تبني المزارعين الفلسطينيين للممارسات الزراعية الجيدة (PAL-GAP) في شمال الضفه الغربية. وتسعى الحكومة الفلسطينية من خلالها إلى توجيه أنظمة الإنتاج نحو الزراعة المستدامة والآمنة بيئيًا، بما يساهم في تحسين دخل المزارعين وربطهم بأسواق جديدة، إضافة إلى تقليل المدخلات الكيميائية وتطبيق نظام متكامل من المزرعة حتى المستهلك.

اعتمدت الدراسة على استبيان وُزع على عينة عشوائية من 291 مزارعًا للخضروات المروية. شمل الجزء الأول من الاستبيان متغيرات ديموغرافية واجتماعية واقتصادية مرتبطة بالمزارعين ومزارعهم، مثل الموقع، العمر، المستوى التعليمي، حجم الأسرة، مساحة المزرعة، والدخل. أما الجزء الثاني فتناول وعي واهتمام المزارعين بالممارسات الزراعية الجيدة، ومدى تطبيقهم لها، إضافة إلى معرفة العوائق التي تحد من الحصول على شهادة PAL-GAP.

أظهرت النتائج أن 10% فقط من المزارعين يحملون شهادةPAL-GAP ، في حين أن معظمهم يطبقون بعض الممارسات، مع استعدادهم لتبنيها بالكامل إذا توفرت الإمكانيات المادية. كما بينت النتائج أن وعي المزارعين بالممارسات الزراعية الجيدة مرتفع (71%)، وأن اهتمامهم وتقييمهم لها عالٍ، لكن التطبيق العملي ما يزال متوسطًا.

خلصت الدراسة إلى أهمية تعزيز وعي المزارعين عبر ورش عمل وتدريب عملي يوضح متطلبات الشهادة وآليات التطبيق، مع ضرورة توفير دعم مالي لتسهيل الحصول على الشهادة. كما أوصت بإنشاء مراكز تغليف عالية الجودة لتحسين المنتج، وزيادة الربحية، وضمان وصول المستهلكين لمنتجات آمنة وصحية، وفتح آفاق التصدير للمنتجات الفلسطينية.

الكلمات المفتاحية: العوامل المؤثرة، تبني المزارعين، الممارسات الزراعية الجيدة الفلسطينية (البال جاب).