

## **AN INVESTIGATION INTO THE PERCEIVED FARM MANAGEMENT AND MARKETING EDUCATIONAL NEEDS OF FARM OPERATORS IN JORDAN**

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### **Abstract**

*The study aimed to investigate the educational needs of producers on farm management and marketing skills using two 5-point Likert scales. Data were collected from a sample of 120 producers in the main irrigated area in Jordan, and non-parametric tests were used to analyze the data. Producers were largely commercial, but the majority does not perceive the need to participate in training activities on farm management and marketing skills. Higher scores on both scales were observed for full time operators, renters, the risk-averse, the more dependent on farm income and hired-labor; those who make use of sources of information more intensively; those who preferred group extension; and those who use computers in business management. Efforts have to be made to investigate the educational needs of operators with low ratings, and to develop an understanding of the importance of farm management. The more positive operators have to be targeted through group extension techniques to initiate simple book keeping, and financial analysis tools to promote business-like farming. While the educational role of improving the managerial abilities of the producers remains an important task for state extension, the public and private sector can cooperate in areas where the private companies can benefit from activities such as book-keeping and technical and financial management software.*

### **Introduction**

Farmers need management and marketing skills to survive in a highly competitive business environment. High risk and the high technology nature of business require sound business management skills. Knowledge of farm management principles provides farm operators a basis for sound farming decision-making; it helps them to solve economic problems associated with maximization of returns or minimization of costs (Johl & Kapur, 1987). Farm operators need to maintain effective book-keeping systems, and to be able to interpret and analyze their records properly if the best management decisions are to be made. The analyses help to make the right choice among enterprises according to individual levels of financial, labor, land resources, and risk aversion (AGSP, 2002). The farm management extension agent should assist in setting up a working record system, and to

help analyze the farm operation from the previous year's records and help to plan for the future (Bryant, 2000). However, production is not completed until products are at the point of purchase and are producing consumer satisfaction. Farm operators and their information needs are thus inevitably linked into finding solutions to marketing problems, as well as to production (Rolls, 2001). Farm management extension has to be supported by marketing extension to help farm operators to plan timing, quality, and quantity of products to satisfy the targeted market.

It is essential to improve farm management and marketing skills of farm operators continuously through extension and participation in training activities. Grouping producers according to their management problems and needs for education, training, and advice is more feasible and achieves economy if sufficient understanding of management tasks can be

obtained (Dalton, 1980). Kohl and White (2001) suggested that specific needs and advisory services in the area of management for the targeted producers have to be based on the size of annual sales. Group learning is effective in promoting successful change for small businesses (Kilpatrick, 1998). Dealing with groups of producers in a participatory approach, will improve their ability to use management concepts and techniques such as bookkeeping, budgeting, and financial statements. Mass media and self-instructional aids help to create awareness of farm management topics and to supplement group methods of extension. The effectiveness of state extension can be enhanced if the services of other professionals such as commercial representatives who work for producers can be improved by training and the provision of information (Dalton, 1980; Rimawi & Karablieh, 2002).

Farm operators in Jordan are adapting well to technological change, but restructuring the economy and freeing of trade in the context of a market-oriented economy and the membership of the World Trade Organization have changed the landscape of agriculture. Despite the rapid pace of technological change, most producers reported that they were incurring economic losses (Habbab & Rimawi, 2002). Deficiency in business management and marketing skills of producers is placing their long-term viability in danger. Rimawi (2003) indicated that the public extension program is oriented to the technical and the production aspects, and only 8% and 5% of the public extension agents respectively reported that they covered farm management and marketing in their extension work. The new economic environment has created new challenges for producers. To help meet the challenges facing agriculture, producers should have a high degree of management ability. The professional farm management and marketing extension agents can improve the managerial ability of the farm operators appreciably to keep agriculture in Jordan viable and competitive through extension educational programs. But, research evidence has suggested that many producers in different parts of the world do not perceive the need to participate in training

activities to upgrade their management skills, and are reluctant to participate in training activities (Breazeale, Myer, & Hill, 2001; Murray-Prior & Dymond, 2000). Hence, there is a need to assess the perception of farm operators of management and marketing knowledge, their educational needs, and how to meet these needs.

### **Purpose and Objectives**

The purpose of this study was to get a better understanding of the attitudes and educational needs of farm operators for farm business management and marketing extension and the way to provide it. The specific objectives of the study were:

- (a) To investigate the perception of farm operators of farm management, their educational needs, and the attributes associated with their perception ratings.
- (b) To investigate the educational needs of farm operators of marketing extension, and the attributes associated with these needs.
- (c) To examine the preferred methods of delivery of farm management and marketing extension.

### **Methods**

The population of the study was the operators of horticulture crop farms in the major irrigated area in the Jordan Valley of the state of Jordan. A sample of 120 farm units was selected with the help of the Department of Agricultural Statistics Service. One hundred producers from the selected farm units were eventually interviewed personally during the period of September to October 2002. The response rate achieved was 83%. Lindner, Murphy and Briers (2001) suggested that procedures for control of non-response error are not necessary when a response rate beyond 85% is achieved. Thus, response rate is about right, and the threat to the external validity of the findings is minimal.

A structured questionnaire was prepared, pre-tested in different sites of the study area, and modified accordingly to improve the clarity of questions and to remove irrelevant

questions. Beside demographic information, topics covered needs for farm management and marketing extension and methods of information presentation. Two 5-point Likert-type scales were used as an instrument to collect data on the perception of farm management concepts, tools and extension, and the perception of the need for marketing extension. The ratings were on a scale of one to five, with one being strongly disagree, two being disagree, three being neutral, four being agree and five being strongly agree. To achieve the first objective, the perception of farm management extension scale was constructed. It consisted of 14 items, the ratings ranged between 14 and 70 points, and the Cronbach alpha coefficient was 0.96. To achieve the second objective, the perception of marketing extension scale was constructed. It consisted of 10 items, the ratings ranged between 10 and 50 points, and the Cronbach alpha coefficient was 0.93. Thus, Cronbach's alpha coefficients indicated that the instrument scales were internally consistent.

To test the differences between the ratings of the study scales that were measured on an ordinal scale, the non-parametric tests Mann-Whitney (M-W) and Kruskal Wallis (K-W) were used instead of *t*-test and one-way ANOVA, respectively. Unlike *t* and *F* tests, M-W and K-W tests do not require normally distributed data, and the form of the distribution need not be specified. Spearman rank test was used to measure the correlation between the scale scores and ranked variables. The levels of perception of needs were established on the basis of the mean ratings of the scales. Ratings less than the mean score were labeled as low, and ratings equal or more than the mean score were labeled as high. The test of independence ( $\chi^2$ ) was used for category data to examine the associations between the levels of perception and the individual rating of the scale items and the attributes of farm and farm operators.

## Results

### *Profiling farm operators*

Farm operators were found to be relatively old as 61% were 50 years or older.

One-third had graduated from secondary school or higher, and one-fifth were illiterate, which is double the illiteracy rate in Jordan (DOS, 2001). Three-quarters of operators had experience in agriculture of more than 10 years, 59% rented or sharecropped their land, and 18% reported raising animals largely for family consumption. Hired labor was the norm as two-thirds of farm households of operators contributed less than 25% of farm work, 59% reported working on the farm six months or more, 86% were full-time farm operators, and 82% depended more on farm income. These characteristics indicate that farming is largely commercial.

### *Educational needs in areas of farm business management extension*

Identifying needs of farm operators to improve their management skills and finding the best way to provide it is a challenge, as they may find it hard to express what they need (Young, 1998). To achieve this objective, operators were asked to rate their perception of the relative need of farm business management areas using a scale that consisted of 14 items. The scale was used to measure the perception of operators and their needs for farm management extension, and to rank the topics of interest to them on the basis of their perception. The items in this scale covered filing, financial and technical book-keeping, short and long term budgets, income statements and preparation and evaluation of balance sheets, credit management, optimum input levels, and use of computers in technical and financial management. Perceptions toward farm management extension appears to be not so positive. Twenty to thirty-nine percent agreed or strongly agreed when asked to rate their need for extension for all items of the scale. The mean rating was 43.5 points (62.1% of the maximum value). This is consistent with the observation of Murray-Prior and Dymond (2000), who concluded that many farm operators in Australia did not perceive the need to participate in training activities to upgrade their management skills.

Almost all the mean rating for items ranged between 3.05 to 3.32 points. The lowest mean ratings were observed for

extension on the use of computers in farm management (2.59 points), and input optimization (3.02), as 20-30% scored 4 or 5 points when asked to rate their need for extension in these areas. Full time operators, those who contributed more than 6 months to the farm work, renters, and those who took calculated decisions were more likely to give 4 or 5 scores ( $\chi^2$  Test:  $p = 0.018 - 0.099$ ). The highest mean ratings were observed for extension on filing (3.32) and book-keeping (3.30), with 37-40% scoring 4 or 5 points when asked to rate their need for

extension in these areas. Renters and those who make deliberate decisions were more likely to give 4 or 5 scores ( $\chi^2$  Test:  $p = 0.011 - 0.051$ ). The operators appeared to be more willing to learn about the more simple techniques such as filing and basic bookkeeping rather than the more sophisticated tools such as the input/output optimization and use of computers.

Table 1 presents the results of M-W and K-W tests to investigate the differences in the mean ratings of the need of farm management extension scale by farm and

Table 1  
*Statistical Relationships Between Mean Ratings of the Need of Farm Management Extension Scale by Selected Attributes, Farm Operators, Jordan, 2002*

Categorical Variable	Test	Coefficient	df/n	P-value
Age (< 30, 31-50 & > 50 Years)	K-W	$\chi^2 = 1.39$	df= 2	0.498
Family size (< 5, 6-10 & > 10 persons)	K-W	$\chi^2 = 0.07$	df= 2	0.992
Education (illiterate, basic & secondary+)	K-W	$\chi^2 = 5.69$	df= 2	0.058
Off-farm employment (full-time & part-time farming)	M-W	U = 293	n = 97	0.054
Farm work per year (< 6 & $\geq$ 6 months)	M-W	U = 793	n = 97	0.819
Family farm work share (< 25% & $\geq$ 25%)	M-W	U = 672	n = 97	0.246
Share of farm income (< 50% & $\geq$ 50% of total income)	M-W	U = 512	n = 96	0.929
Farm income (main source & supplementary income)	M-W	U = 280	n = 96	0.020
Experience in agriculture (< 5, 6-10, & >10 years)	K-W	$\chi^2 = 0.94$	df= 3	0.709
Size of the farm (< 1.5, 1.6-3.0 & > 3.0 ha)	K-W	$\chi^2 = 0.07$	df= 2	0.965
Land tenure (owned, & rented)	M-W	U = 545	n = 97	0.020
Raising animals (yes & no)	M-W	U = 290	n = 93	0.083
Selecting enterprises (custom, experience, risk & profit)	K-W	$\chi^2 = 8.05$	df = 2	0.018

Note. M-W stands for Mann-Whitney test, and K-W stands for Kruskal Wallis test.

farm operator's attributes. Significant differences were observed by way of selecting enterprises, land tenure, farm income, and the education level. Significantly higher ratings were observed for those who take deliberate decisions for selection of enterprises on the basis of their experiences rather than custom or risk-taking ( $\chi^2 = 8.05$ ,  $df = 2$ ,  $p < 0.018$ ); who rent or sharecrop their farms ( $U = 545$ ,  $n = 97$ ,  $p < 0.020$ ); whose farm income is the main source of income ( $U = 280$ ,  $n = 96$ ,  $p < 0.020$ ); and who have higher educational levels ( $\chi^2 = 5.69$ ,  $df = 2$ ,  $p < 0.058$ ). This suggests that those who were more dependent on farm income, renters, and the more educated, were more likely to be more positive to farm management extension activities. The results of the test of independence ( $\chi^2$ ) with the levels of need of farm management extension confirm the M-W and K-W tests.

#### *Educational needs in areas of marketing extension*

Farmer support in the form of marketing extension services is vital. To measure the need of farm operators for training of marketing extension activities, they were asked to rate their perception of the need to provide extension services on a scale that consisted of 10 items. The items in this scale covered timing for planting, type of crop, alternative enterprises, diversification through introduction of new crops, methods and timing for harvesting, sorting, grading, packing, market information on alternative markets and prices, and the standards and opportunities for exporting. As compared to the need for farm management extension scale, fewer operators (15 - 36%) agreed or strongly agreed when asked to rate their need for extension for all items of the marketing extension scale. The mean ratings were 28.5 (57% of the maximum value). The mean rating for individual items ranged between 2.54 to 3.61 points. The relative unwillingness for marketing extension contradicts the widely held view that marketing is the main obstacle to viable farming. One possible explanation for the lack of sufficient interest may be due to the belief that some of the

operators may rate their level of economic and financial management expertise higher than that of the extension agents.

The lowest mean ratings were observed for marketing extension on export opportunities (2.54), market information on prices (2.59), and packing (2.60), with 15-20% scoring 4 or 5 points when asked to rate their need for extension in these areas. Renters, and those who make deliberate decisions were more likely to give 4 or 5 scores ( $\chi^2$  Test:  $p = 0.022 - 0.039$ ). The highest mean ratings were observed for extension on planting time (3.09), type of crop and new crops (3.01), with 32-37% scoring 4 or 5 points when asked to rate their need for extension in these areas. Renters, and those who depend more on farm income, and those who tended to take calculated decisions, were more likely to give 4 or 5 scores ( $\chi^2$  Test:  $p = 0.015 - 0.089$ ). The operators appeared to be more willing to learn about the crops in demand and the right time for their marketing rather than export markets. A possible explanation of this result is that few producers were directly involved in export activities.

Table 2 presents the results of M-W and K-W tests to investigate the differences in the mean ratings of the need of marketing extension scale by farm and farm operators attributes. Significant differences were observed by the way of selecting enterprises ( $\chi^2 = 12.99$ ,  $df = 2$ ,  $p < 0.002$ ), land tenure  $U = 769$ ,  $n = 97$ ,  $p < 0.006$ ), and family farm work share ( $U = 852$ ,  $n = 97$ ,  $p < 0.066$ ). The educational level approaches the 0.10 significance level ( $p < 0.116$ ). Significantly higher ratings were observed for those who based their decisions for selection of enterprises on their experience; who rented their farms; whose families contributed less to farm work; and who did not raise animals. This suggests that the cautious decision makers rather than risk-takers or profit maximizers; renters; and those who depended more on hired labor and did not raise animals were more likely to be positive to marketing extension. The results of the test of independence ( $\chi^2$ ) with the levels of the need of marketing extension confirm the M-W and K-W tests.

Table 2  
*Statistical Relationships Between Mean Ratings of the Need of Marketing Extension Scale by Selected Attributes, Farm Operators, Jordan, 2002*

Categorical Variable	Test	Coefficient	df/n	P-value
Age (< 30, 31-50 & > 50 Years)	K-W	$\chi^2 = 1.79$	df = 2	0.409
Family size (< 5, 6-10 & > 10 persons)	K-W	$\chi^2 = 1.31$	df = 2	0.521
Education (illiterate, basic & secondary+)	K-W	$\chi^2 = 4.46$	df = 2	0.107
Off-farm employment (full-time & part-time farming)	M-W	U = 501	n = 97	0.414
Farm work per year (< 6 & $\geq$ 6 months)	M-W	U = 1040	n = 97	0.465
Family farm work share (< 25% & $\geq$ 25%)	M-W	U = 852	n = 97	0.066
Share of farm income (< 50% & $\geq$ 50% of total income)	M-W	U = 688	n = 96	0.899
Farm income (main source & supplementary income)	M-W	U = 664	n = 96	0.721
Experience in agriculture (< 5, 6-10 & > 10 years)	K-W	$\chi^2 = 4.19$	df = 3	0.224
Size of the farm (< 1.5, 1.6-3.0 & > 3.0 ha)	K-W	$\chi^2 = 1.67$	df = 2	0.433
Land tenure (owned, & rented)	M-W	U = 769	n = 97	0.006
Raising animals (yes & no)	M-W	U = 488	n = 93	0.116
Selecting enterprises (custom, experience, risk & profit)	K-W	$\chi^2 = 12.99$	df = 2	0.002

Note. M-W stands for Mann-Whitney test, and K-W stands for Kruskal Wallis test.

#### *Sources and methods of extension*

Operators were asked to identify and to rank their sources of agricultural information, and to indicate their preferences for various methods of receiving information. Table 3 presents the respondents' ratings of various sources of information. The mean rank of each source indicates the relative order of the respondents' ratings in descending order. Seven to eight percent of operators scored 5 points to either public or private extension

through agricultural firms as a major source of information, which suggested that farmers put private firms (mean rating = 2.63 points) on an equal footing with the public extension (mean rating = 2.74). The National Agricultural Research and Technology Transfer Center (NCARTT) tends to be a secondary source of information (mean rating = 2.48). Other farmers appeared to be much less important as a main source of information (mean rating = 2.21).

Table 3  
*Respondents' Ratings of Sources of Agricultural Information in Percent, Farm Operators, Jordan, 2002 (n = 98)*

Source of information	Mean Rating	Major Source f / (%)	Medium Source f / (%)	Secondary Source f / (%)	Low Source f / (%)	Not a Source f / (%)
Public Extension	2.74	7 (7.1)	18 (18.4)	35 (35.7)	19 (19.4)	19 (19.4)
Private Extension	2.63	8 (8.2)	9 (9.2)	37 (37.8)	27 (27.6)	17 (17.3)
Research Center (NCARTT)	2.48	1 (1.0)	19 (19.4)	25 (25.5)	34 (34.7)	19 (19.4)
Other Farmers	2.21	1 (1.0)	4 (4.1)	30 (30.6)	43 (43.9)	20 (20.4)

Using K-W test, mean ratings of the farm management and marketing extension scales were significantly higher for those who rely on the public extension as their major source of information ( $p < 0.013$  to  $p < 0.075$ ), those who rely on the private firms ( $p < 0.027$  -  $p < 0.054$ ), and those who rely on the NCARTT as their major source of information ( $p < 0.002$  to  $p < 0.013$ ). These results suggest that the more the producers make more intensive use of sources of information, the higher will be their scores on the farm management and marketing extension training needs scales.

Table 4 shows the various extension methods and the farmers' preference for each. Thirty-one percent scored 4 or 5 points on individual extension (basically on-farm visit), with a mean rating of 3.13 points, against 27% for group extension methods, with a mean rating of 2.81 points, and 1% for educational materials, with a mean rating of 1.94 points. Few operators (5%) indicated that they had seen bulletins in farm management. However, using K-W test, mean ratings of the farm management and marketing scales were significantly higher for those who preferred group

extension ( $p < 0.005$  to  $p < 0.009$ ). Group extension is more feasible as a communication channel. The present ratio of one extension worker to 800 farmers is quite low (personal communication, Director of State Extension in Jordan, June 25, 2003), which effectively ruled out the possibility of using farm visits as a main method of communication. Rimawi (1996) indicated that public extension services in Jordan were not in a position to offer detailed individual services to all farm operators with the resources they had at that time. Therefore, extension agents have to work with groups of producers on their management problems. Through group extension, mainly workshops, group discussions, and seminars, and using practical exercises on actual farm situations, budgets and the farm financial statements may be introduced and explained as to how they are organized, constructed, analyzed, and evaluated against established standards to measure performance. Similarly, the significance of market information and marketing concepts may be discussed. Educational materials are important to support personal extension activities.

Table 4  
*Respondents' Perceptions by Percent Concerning Methods of Extension, Farm Operators, Jordan, 2002*

Extension Method	Mean Rating	Strongly Approve f / (%)	Approve f / (%)	Neutral f / (%)	Disapprove f / (%)	Strongly Disapprove f / (%)	Total f / (%)
Individual Extension	3.13	20 (20.4)	10 (10.2)	43 (43.9)	13 (13.3)	12 (12.2)	98 (100.0)
Group Extension	2.81	4 (4.0)	23 (23.0)	37 (37.0)	22 (22.0)	14 (14.0)	100 (100.0)
Educational Materials	1.94	0 (0.0)	1 (1.0)	16 (16.5)	57 (58.8)	23 (23.7)	97 (100.0)

Ten percent of the respondents owned a personal computer set, which was identical to the overall percentage of the Jordanian households who owned personal computers (DOS, 2001). Almost all computer owners reported using it for technical and financial management. Using M-W test, mean ratings of the farm management scale were significantly higher for those who used a computer in business management, and appear to be more commercially oriented (U, 99,  $p < 0.002$ ). Similarly, mean ratings of the marketing extension scale were significantly higher for those who used computers (U, 230,  $p < 0.015$ ). Technical and financial management software can help producers to establish a comprehensive database, and to manage their farms more effectively.

### Conclusions and Implications

Farm business management and marketing skills are important to business viability and profitability. Most producers stress the technical aspects of production without due regard to the economics of production and marketing, which severely limits the impact of extension. Despite the observation that farm operators were largely commercial, the study results revealed that a minority of operators had high perception

ratings on farm management and marketing extension, which indicates that most operators did not perceive the need to participate in training activities. The implications are that there is a need to develop understanding of the importance of farm management to reorganize the extension services with respect to scope, to provide more relevant extension programs to their clientele and to develop agribusiness education, which addresses technical areas, as well as marketing and business management areas to enhance efficiency as well as viability of farming activities. Courses in the faculties of agriculture have to be reoriented to deal with technical aspects, as well as management skills, and marketing to help train extension agents with business aptitude.

Operators with higher perception scores on farm management and marketing extension scales were more likely to be full time operators, renters, risk-averse, and more dependent on farm income and hired labor. The implications are that the more positive operators have to be targeted by the extension education programs to help them to plan timing, quality, and quantity of products to satisfy the targeted market. To promote business-like farming, producers have to be supported to establish a simple, but effective farm record system, and to be

advised on how to employ farm data for organizing and managing production and marketing using simple financial management tools.

Higher perception ratings were observed for those who utilized more sources of information, preferred group extension, and who used computers in business management. Operators gave similar scores to either public or private extension as a major source of information, which suggests that the private firms stand equal to the public extension. The implications are that through group extension, and using practical exercises on actual farm situations, tools of farm management and marketing concepts may be introduced and explained in a participatory approach for the targeted groups. Representative budgets for a wide variety of agricultural enterprises and regions should be made available, and the extension agents can help farm operators to modify these budgets to reflect better their situation. In spite of the leading role of the public sector in this educational task, concerted efforts by the public and private sectors in areas of mutual benefits can benefit producers to upgrade their management skills. Self-learning educational materials and management software in the profession of farm management have to be produced and promoted. Activities such as book-keeping and technical and financial management software can be equally rewarding for both; the private companies and the farm operators. Instruction manuals would cover simple forms of financial and production records, how to prepare budgets, income statements, balance sheets, and how to calculate indicators for farm financial analyses.

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