21st ESEE

European Seminar on Extension Education

02-06 SEPTEMBER 2013, ANTALYA

Extension Education Worldwide

trends, challenges and cases

Coordinated by

Orhan Özçatalbaş

with the collaboration of

International Scientific and Organizing Committee

21st ESEE EUROPEAN SEMINAR ON EXTENSION EDUCATION, EXTENSION EDUCATION WORDWIDE, TRENDS, CHALENGES AND CASES. 02-06 SEPTEMBER 2013, ANTALYA, BAKA YAYIN: 2013/85

Adoption of Short-Life Rice Among Egyptian Farmers, Delta of the River Nile.

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Abstract

Increasing rice production is neededto meet the ever-increasingcereals demands in Egypt. The Ministry of Agriculture& Land Reclamation started, in 2000, to introduce short-life cultivars,developed bySakha Regional Research Station, withsuch advantages as: shorter times from sowing to harvest, less irrigation water andhigh yields.The study problem was to explore the farmers' adoption of three new cultivars (Sakha 101, Sakha 104 and Giza 177), degrees of innovativeness, and the relationships with farmers' characteristics. The study was conducted in Arimon Village, Kafr Al-Sheikh Governorate. A random sample of 300 short-life rice cultivators (about 15% ofall the1.900 producers),was selected and personally interviewed by using a questionnaire. Frequencies, percentages, Chi-Square and Correlation Coefficients were used for data presentation and analysis.Results revealed:

Medium scores (134-139 scores), among about 88% of respondents. Adoption scores ranged between 76 and 152 (since 2 scores were assigned to applying, 2 scores to continuing applying each of the 38 technical practices, covering all production requirements,1 score to non-application, and 1 score to discontinuing).

-High rates of adoption, indicated by % of respondents who cultivated, out of total respondents informed about each variety(97% forSakha 101, 96% for both Sakha 104 and Giza 177).

-Concerning farmers' innovativeness, nearly S shape distributions were found in the three rice cultivars.

-Statistically significant relationships were found between adoption scores and:Land area cultivated with the short-life variety (r= 0.130), Total land holding (r= 0.115), Amount of total rice production (r= 0.121), and Continuance of cultivating same variety (Chi= 12.38).

Key Words: *Adoption, Short-life rice cultivars, Nile Delta, Egypt.*

INTRODUCTION

Rice (Oriza Sativa) is the second most important cereal crop in Egypt and Worldwide. It is widely accepted as major food all over the world, especially in Africa and Asia. Increasing rice production is needed to meet the ever-increasing cereals demands in Egypt. The Ministry of Agriculture & Land Reclamation (MALR) started, in 2000, to introduce short-life rice cultivars, developed bySakha Regional Research Station, with such advantages as: shorter times from sowing to harvest (120-140 days), less irrigation water (saving 20-25% of irrigation water) and high yields (4-4.5 Tons per Feddan / 10 Tons per Hectare). According to the Sustainable Agriculture Development Strategy (SADS 2030, p22)), the projected yield / Feddan for 2030 is 5.2 Tons / Feddan.

The study problem was to explore the farmers' adoption of three new cultivars (Sakha 101, Sakha 104 and Giza 177), degrees of innovativeness, and the relationships with farmers' characteristics. The objectives of the study were to:

a) Measure the scores of adoption, rate of adoption and innovativeness, among rice cultivators, of the three rice cultivars,

b) Explore the relationships between adoption scores and some characteristics of rice cultivators,

c) Identify the type of distribution of the annual and cumulative number of adopters of the three rice cultivars,and,

D)Investigate the rice cultivators' exposure to sources of information in the area of rice cultivation.

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METHODOLOGY

The study was conducted in Arimon village, in Kafr El-Sheikh Governorate, as one of the biggest areas of the Nile Delta cultivated with rice. Kafr El-Sheikh is one of the biggest Governorates of the Nile Delta, Its total area is 3748 squared Kilometers and its population size is around 2.4 millions (MALR,2010).In Arimon, as one of the biggest villages in the Governorate the total cultivated area is about 2529 Feddansand the total number of land holders is 1900 (Directorate of Agriculture, Kafr El-Sheikh).A random sample of 300 short-life rice cultivators (about 15% of all the1.900 producers in the village), was selected and personally interviewed by using a questionnaire. This questionnaire was designed and pretested for achieving the study objectives. It included sets of questions to measure the study variables, as follows:

Adoption scores:(since 2 scores were assigned to applying, 2 scores to continuing applying each of the 38 technical practices, covering all production requirements, 1 score to non-application, and 1 score to discontinuing). Adoption scores, therefore, ranged from the minimum of 76 to the maximum of 152.

Rate of adoption of the rice cultivar: estimated by the number of respondents cultivating the cultivar divided by the total number of the respondents and multiplied by 100.

Respondents' innovativeness: indicated by the year when the respondent started to cultivate, and continued to cultivate the rice cultivar, within the time period from 2000 to 2011.

Respondents' participation in extension activities: indicated by the frequency of contributing to different extension activities. These activities included visits to the extension worker's office, inviting the extension worker to visit the farmer at his field, attending extension meetings, and visiting the agricultural administration in the urban center. The scores of 3, 2, 1 and 0 were assigned to always, sometimes, rarely, and no participation successively. Therefore the scores of respondents' participation in extension activities ranged from 0 to 12.

Respondents' exposure to sources of information in the area of rice cultivation covered 10 sources. The scores of 3, 2, 1 and 0, were assigned, sequentially to different frequencies of exposure to these sources as follows: always, sometimes, rarely and no exposure. The weighted average scores were estimated by multiplying the always responses by 3, added to sometimes responses multiplied by 2, added to rarely responses multiplied by 1, and dividing the total by the number of respondents (300) multiplied by 3. Consequently the range of the weighted average scores range from 0 to 3.

Frequencies, percentages, average means, Pearson's correlation coefficients and Chi-square were utilized for data presentation and analysis.

Results:

As shown in table (1) the most important respondents' characteristics were as follows:

- Respondents' age ranged from 22 to 76 years, with an average mean of about 46, and standard deviation of 13.6. The majority (about 79%) of the respondents are from young and middle age categories.
- Nearly one half (about49%) are illiterate or less educated (can only read and write), compared with small proportions (about 30%) who completed their secondary or university education.
- The majority of the respondents (about 75%) have medium land holdings , compared with 24% having small land holdings.
- The majority of the respondents (about 89%) have medium and high degrees of participation in extension activities.
- More than on half of the respondents (about 57%) have medium and high degrees of attitudes toward agricultural innovation.
- Respondents rate of adoption of the three rice cultivars were very high (96% or more).
- Respondents scores of adoption of the technical recommended practices of cultivating the three cultivars ranged from 128 to 142, with an average mean of about 135, and standard deviation of 2.15. The majority of respondents (about 88%) have medium scores, compared with only 4% who have low scores.

As shown in table (2), statistically significant relationships were found between adoption scores and: Land area cultivated with the short-life variety (r= 0.130), total land holding (r = 0.115), amount of total rice production (r= 0.121), and continuance of cultivating the same cultivar (Chi = 12.38).

- As shown in table (3), and figures (1) through (6), the annual and cumulative numberof adopters of the three rice cultivars were distributed nearly as a normal curve, whereas the cumulative number of adopters of the three rice cultivars were distributed on S shape. This confirms the literature of diffusion and adoption of innovations (for example : Rogers, 2003).

- As shown in table (4), the most important sources of information in the area of rice cultivation were: the extension workers, with a weighted average of 2.61, relatives and neighbors (2.46), and TV programs (2.45). Printed extension materials, agricultural researchers and staff of the faculty of agriculture did not demonstrate high importance.

Table (1)Distribution of respondents according the studied variables.

Variables	Freq.	%	Range	Average Mean	S.D
Age ((N= 300):					
Young (less than 40 years)	111	37.0	22 – 76	45.56	13.6
Middle age (40 – 58 years)	127	42.3			
Old age (59 years and above)	62	20.7			
Educational Level ((N= 300):					
Illiterate	104	34.7			
Can read & write	44	14.7			
Completed Primary school	19	6.2			
Completed Preparatory school	42	14.0			
Completed Secondary school	77	25.7			
University Graduate	14	4.7			
Total land holding ((N= 300):					
Small (up to 1 Feddan)	73	24.3			
Medium (more than 1- 5 Feds)	225	75.0	0.46-	1.93	25.1
Large (More than 5 Feds.)	2	0.07	9.5		
Participation in Extension Activities:					
Low (2-5)	32	10.7			
Medium (6-9)	245	81.7	2 – 12	7.3	1.5
High (10-12)	23	7.7			
Attitudes toward Ag, Innovation:					
Low (15-20)	129	43.0			
Medium (21-25))	132	44.0	15 – 30	21.5	2.59
High (26-30)	39	13.0			
Rate of adoption of rice cultivars:					
Sakha 101	292	97.0			
Sakha 104	289	96.3	--	--	--
Giza 177	288	96.0			
Adoption scores:					
Low (128-133)	13	4.3			
Medium (134-139)	263	87.7	128-142	135.2	2.15
High (140 and above)	24	8.0			

Table (2) The relationships between adoption scores and some studied variables.

Variables	Pearson's correlation coefficients	Chi-square value
Respondents' age	- 0.130*	--
Total Land holding	0.121*	--
Land holding cultivated with rice	0.184**	--
Amount of rice productivity	0.121*	--
Continuance of cultivating same variety		12.38*

- Significant at 0.05 level ** Significant at 0.01 level

Table (3) Annual and cumulative number of adopters of the three rice cultivars.

Year	Sakha 101(N=292)		Sakha 104(N=289)		Giza 177(N=288)	
	Annual No.	Cumulative No.	Annual No.	Cumulative No.	Annual No.	Cumulative No.
2000	1	1	2	2	2	2
2001	2	3	4	6	4	6
2002	2	5	12	18	10	16
2003	6	11	20	38	18	34
2004	7	18	47	85	26	60
2005	44	62	82	167	40	100
2006	61	123	70	237	60	160
2007	58	181	29	266	50	210
2008	47	228	15	281	38	248
2009	40	268	8	289	25	273
2010	18	286	--	--	10	283
2011	6	292	--	--	5	288

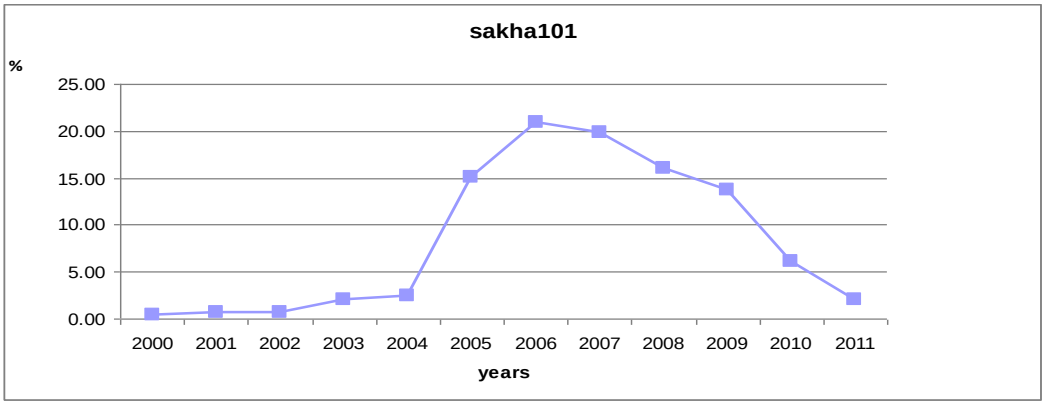


Figure (1) Distribution of adopters of Sakha101 according to their frequencies.

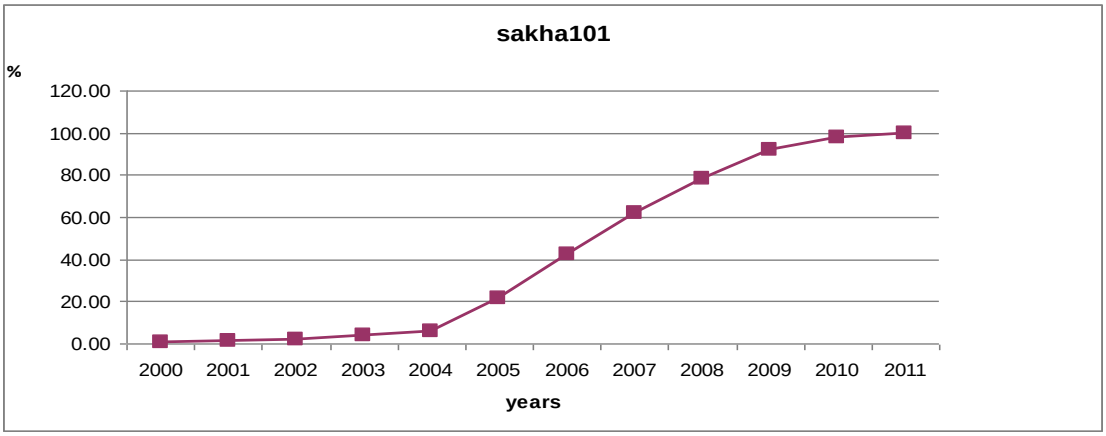
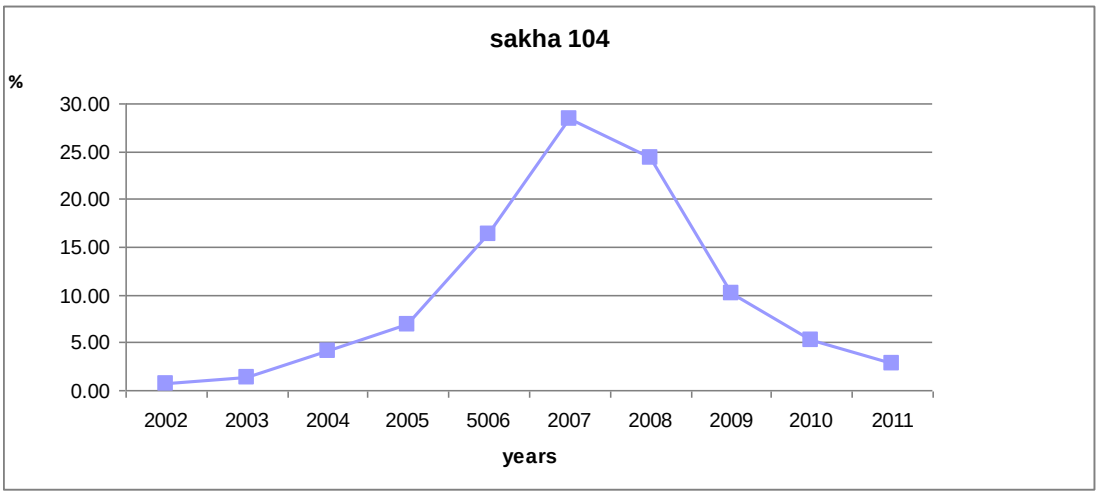


Figure (2)Distribution of adopters of Sakha101 according to cumulative frequencies (S shape distribution).



Figure(3) Distribution of adopters of Sakha104 according to their frequencies.

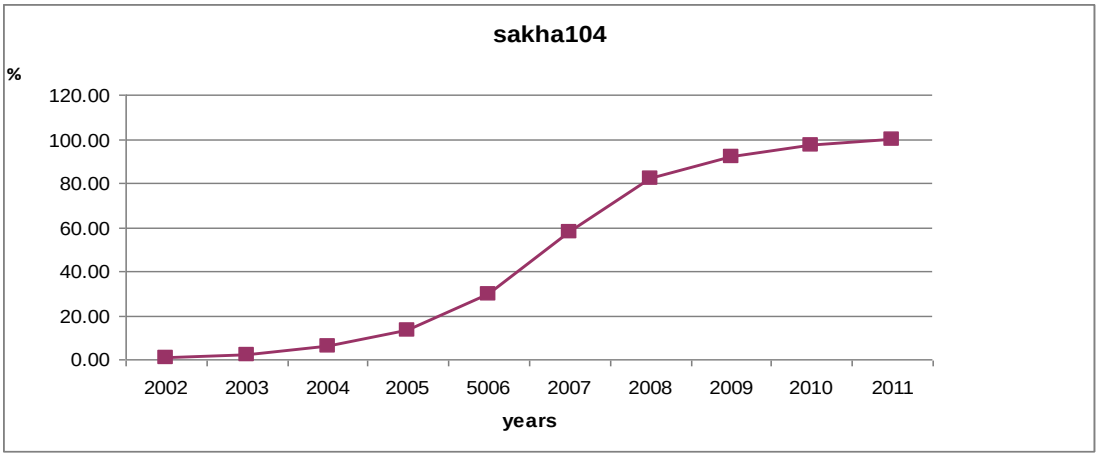


Figure (4) Distribution of adopters of Sakha104 according to cumulative frequencies (S shape distribution).

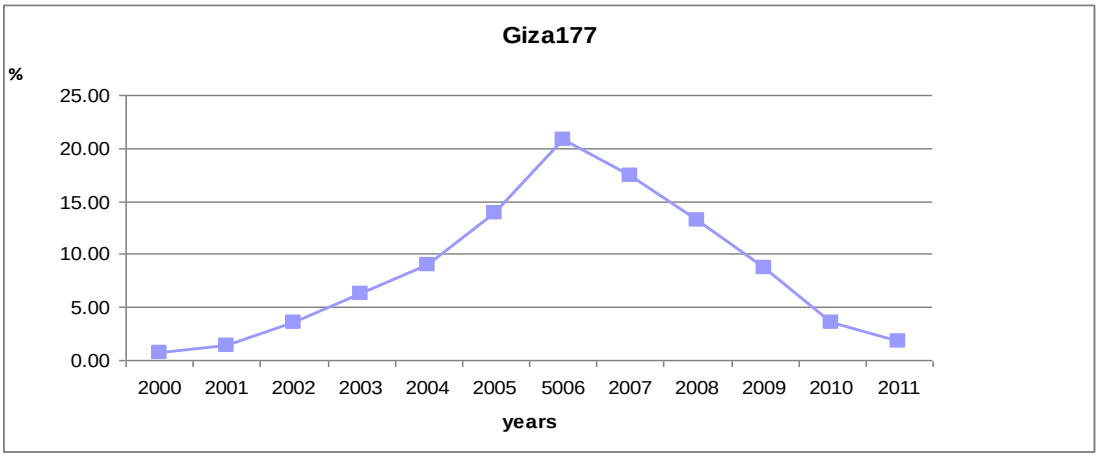


Figure (5) Distribution of adopters of Sakha104 according to their frequencies.

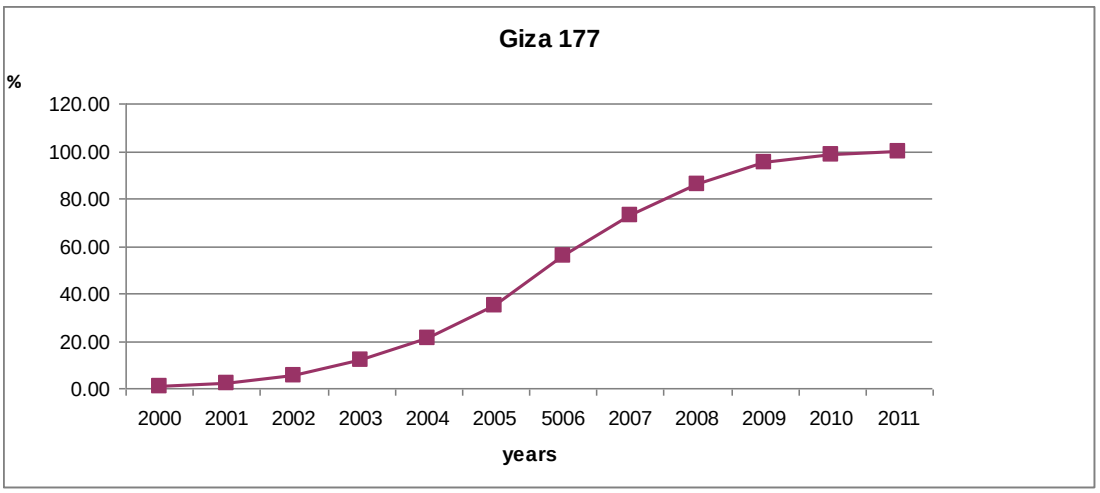


Figure (6) Distribution of adopters of Giza 177 according to cumulative frequencies (S shape distribution).

Table (4) Respondents' exposure to sources of information in the area of rice cultivation

Sources	Always		Sometimes		Rarely		No use		Weighted average
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
Extension workers	187	62.3	110	36.7	3	1.0	-	-	2.61
Relatives and neighbors	146	48.7	148	49.3	4	1.3	2	0.7	2.46
TV programs	146	48.7	144	48.0	10	3.3	-	-	2.45
Radio programs	78	26.0	141	47.0	74	24.7	7	2.3	1.97
Input suppliers	72	24.0	173	57.7	26	8.7	29	9.7	1.96
Agric. Magazines	39	13.0	70	23.3	86	28.7	105	35.0	1.14
Newspapers	23	7.7	71	23.7	93	31.0	113	37.7	1.01
Ex. Pamphlets	5	1.7	34	11.3	71	23.7	190	63.3	0.51
Agric. Researchers	--	--	7	2.3	43	14.3	250	83.3	0.19
Faculties of Agric. staff	2	0.7	--	--	12	4.0	286	95.3	0.06

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