

*Executive Summary of the:*

*Junior Master Gardener® Program  
Coordinator Implementation  
Evaluation*

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## ABSTRACT

*The Junior Master Gardener (JMG) Program is an international youth gardening program of the Cooperative Extension network. In an effort to gain feedback on this program, an implementation evaluation was developed for program coordinators of JMG. Objectives were to determine demographic information on the program coordinators, determine teaching methods program coordinators utilize, and measure perceptions of program coordinators. The population for this descriptive study was a census of listed program coordinators of JMG across the country. A total of 442 of 4,011 (11.02%) respondents completed the web based survey. The majority of respondents were school teachers, Cooperative Extension employees/volunteers, and home school educators (75%). A five-point Likert scale was developed by the researchers to determine satisfaction and usefulness of JMG. Respondents strongly agreed with statements associated with JMG youth participants on general classroom enhancement, interest in science, teamwork skills, performing community service projects, trying fruits and vegetables, increase in personal responsibility, enthusiasm of learning, and attitudes on nutrition. Program coordinators also suggested that all eight chapters from the level 1 curriculum were very useful. Generally speaking, public/private school educators had a less positive response to questions when compared to home school educators and Cooperative Extension educators/volunteers. Suggestions for program improvement include: development of a more reliable database of program coordinators, continued educational trainings via conferences, stress that JMG is a 4-H project, and creation of additional studies to determine how JMG can more effectively meet public/private educator needs.*

## **Introduction**

*Overview of the Junior Master Gardener Program.* The Junior Master Gardener (JMG) Program is an international youth gardening program of the Cooperative Extension network. JMG is a 4-H project that engages children in novel, “hands-on” group and individual learning experiences that promote a love of gardening, develop an appreciation for the environment, and cultivate the mind. JMG inspires youths through service learning and leadership development projects and rewards them with certification.

JMG was released in August of 1999 through Texas A&M University’s Department of Horticulture. Current implementation data indicate that over 970,000 youth have been impacted through training and outreach programs, a total of 850 school districts have been involved in JMG, there are over 27,600 youth enrolled and working toward certification in all 50 states and ten foreign countries, and ethnicity descriptions include: 52% white, 26% Hispanic, 18% African American, 2% Asian or Pacific Islander, and 1% American Indian. (L. Whittlesey, personal communication, February 28, 2003)

*Previous Studies.* There have been several studies that reveal perceptions of youth toward learning, life skill development, gardening, diet, and fruit and vegetable consumption based on youth gardening programs. Skelly and Zajicek (1998) developed a study to measure environmental attitudes of youth participating in a gardening educational program. Their results indicated that these youth did have higher scores pertaining to the environment as a result of using gardening as a tool to educate. In the same year Wallczek and Zajicek (1998) concluded from a separate study that seventh grade students developed better interpersonal relationship skills after participating in a garden program. Cavaliere (1987) and Lineberger (1999) studied trends in healthy eating by youth participating in a gardening program. Cavaliere (1987) concluded that children who participated in the garden learned to like healthy foods while Lineberger (1999) concluded that children in the garden revealed more positive attitudes towards fruit and vegetable snacks and improvement in vegetable preference scores.

While these studies are effective in measuring youth’s knowledge, skills, attitudes, and behavior changes, there is limited research that reveals the attitudes and perceptions of the program coordinator leading these youth through gardening curriculum. Specially, this study aspires to measure the program coordinator’s thoughts concerning the Junior Master Gardener Program. In order to do this, it is important to review the current curriculum that is in place.

*Current Junior Master Gardener Curriculum.* The Junior Master Gardener program currently offers a core curriculum, which covers a broad range of horticultural topics. Science process skills, observation, taking measurements, and problem solving are naturally integrated into the curriculum. There are three major curricula that are being implemented. They include: (1) Level 1 Core JMG Curriculum, (2) Level 1 Golden Ray Series Curriculum - Health and Nutrition from the Garden, and (3) Level 2 JMG Core Curriculum – Operation Thistle: Seeds of Despair.

Level 1 Core JMG curriculum is targeted for grades 3-5 and offers relevant science experiences to youth. The core curriculum of the JMG program is the Level 1 JMG Handbook and Teacher/Leader Guide. The two books compliment each other. Together they contain more than 400 hands-on horticultural and environmental activities. This particular curriculum was created with the assistance of horticultural professionals and tenured teachers. This collaboration of educational professionals resulted in a very innovative and novel curriculum.

As mentioned earlier, research studies suggest that youth participating in gardening programs not only benefit from a higher self-esteem but also better nutritional habits (Cavaliere, 1987; Lineberger, 1999). "Health and Nutrition from the Garden" is the first stand alone thematic JMG Golden Ray Series to be released from the JMG program. The curriculum chapters are: thrifty gardens, basic gardening, growing techniques, food safety, ABC's of healthy eating, and healthy snacks.

In 2002, the JMG program launched its first module of the Level 2 JMG Core Curriculum – Operation Thistle: Seeds of Despair. This curriculum focuses on youths in grades 6-8. Operation Thistle is consistent with the JMG curriculum model to include independent and group learning experiences, life-skill and career exploration, and service learning opportunities for youth.

### **Purpose**

The Junior Master Gardener Program has long been associated as an outstanding, hands-on, interactive way for students to learn about themselves, science, mathematics, and gardening. However, there is limited documentation revealing program coordinator's perceptions concerning the program. Therefore, an implementation evaluation study was developed to determine the perceptions of the program coordinators concerning the Junior Master Gardener Program. The specific objectives were:

1. Determine demographic information on the program coordinators;
2. Determine the teaching methods these program coordinators utilize to teach the curriculum; and
3. Measure perceptions of program coordinators concerning:
  - a. Curriculum's contribution to educational objectives;
  - b. Specific curriculum objectives and content;
  - c. Perception of impact the curriculum leaves on youth participants.

### **Methods**

Descriptive methodology and a correlational design were used to complete the study. A web-based survey was used to collect data following Ladner, Wingenbach & Raven (2002). A web based survey was utilized because of its cost and time effectiveness (Dillman, 2000, p. 359). Each participant was sent a postcard with a password that was specific to them. This was the password used to access the web based survey.

The population for the census study consisted of all program coordinators across the country. These contact names were from the Junior Master Gardener database. After

removal of duplications, 4,011 names were left for the census. A total of 442 (11.02%) respondents completed the web based survey.

The survey instrument consisted of five sections. These five sections were: (1) demographics, (2) training and program support, (3) level of satisfaction, (4) use of curriculum, and (5) youth perceptions of the curriculum. The instrument was developed by the Junior Master Gardener Program faculty. Once the questions were developed, two faculty members from the Texas 4-H & Youth Development Program and two faculty members from the Extension Education Unit developed the design of the survey. The final document was evaluated for content and face validity by all groups before posting. After all corrections were made, a post card notice was sent to the population asking them to complete the web based survey. A follow-up reminder was sent approximately two months after the initial post card mailing via electronic email. It is also important to note that a free tiller was donated and was used as incentive for program coordinators to respond to the survey. In addition, a \$50 gift certificate was also donated from the Junior Master Gardener Program as another incentive to entice participation.

Quantitative data were analyzed using SPSS® software version 10.0 for Windows. Descriptive statistics were derived for each of the five sections. Demographic data were analyzed using percentages and frequencies. Significant relationships between selected variables were established using analysis of variances (ANOVA) and t-tests.

## Results.

*General Demographics.* The first objective was to determine how program coordinators found out about the Junior Master Gardener Program and background information about them. Table 1 reveals how program coordinators first heard about JMG. This question generated 518 responses because respondents were provided an opportunity to select more than one response. The leading response was Extension Agency (38.1%), followed by via an attended training (15.6%), and other (14.1%). Appendix A is included to show “other” responses.

**Table 1. Rank order of how respondents found out about JMG.**

<b>Response Choices</b>	<b>Frequency</b>	<b>Percentage</b>
Extension Agencies	197	38.1
Attended Training	81	15.6
Other <sup>1</sup>	73	14.1
Internet	59	11.4
Friend	48	9.3
Written Publication (Newspaper, Newsletter)	44	8.4
School Administration	14	2.7
Television Radio	2	0.4
<b>TOTAL</b>	<b>518</b>	<b>100.0</b>

<sup>1</sup>Descriptions of other included: Most of the other responses said they heard about JMG at various educator conferences across the country.

Two-hundred, fifty-five respondents said that they have implemented JMG with 12,676 youth. The mean total was 49.7 youth per respondent with a median response of 20.

The questionnaire then asked the respondent to define their role as the program coordinator. The top four responses were public school teachers (26%), Cooperative Extension employees (20.9%), and Master Gardeners (12.2%), and other (11.0%). Appendix B is included to show “other” responses.

Three major groups were also identified from this group for further analysis. Group 1 was composed of public school educators, private school educators, and school administrators (n = 123). Group 2 was defined as home school educators (n = 26). Group 3 was the service learning program coordinators. This group included Cooperative Extension employees, Master Gardeners, 4-H leaders, and other youth service employees (n = 191). Horticultural professionals, parents, and “other” were not assigned to a group because of the perception of crossover between the three groups.

**Table 2. Rank order of how respondents viewed their role as a JMG Program Coordinator.**

<b>Response Choices</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Group Number</b>
Public School Teacher	113	26.5	1
Cooperative Extension Employee	89	20.9	3
Master Gardener	52	12.2	3
Other <sup>1</sup>	47	11.0	NA
4-H Leader	34	8.0	3
Home School Curriculum Coordinator	26	6.1	2
Horticulture Professional	20	4.7	NA
Parent	19	4.5	NA
Youth Service Employee	16	3.8	3
School Administrator	5	1.2	1
Private School Teacher	5	1.2	1
<b>TOTAL</b>	<b>426</b>	<b>100.0</b>	<b>NA</b>

<sup>1</sup>Descriptions of other included: parent, school secretary, other educational group/program.

A description of the audience type was the next question the respondents were asked. This question sought to find out a description of the audience and the setting in which this audience is found. As a result of the possibility that multiple educational types could be implemented with the same audience, seven questions were developed using a yes/no dichotomous scale to answer this question. The seven types that were asked included: a traditional classroom, after school programs, juvenile detention centers, home school groups, youth clubs, botanical gardens, and others. Appendix C is included to show “other” responses.

**Table 3. Frequencies and percentages to the question, “With what type of audience are you using JMG Curriculum?”**

<b>Response Choices</b>	<b>Yes</b>	<b>Total Response</b>	<b>Percentage of Yes</b>
Classroom	194	436	43.9
After School Programs	143	436	32.4
Youth Clubs	115	436	26.0
Other <sup>1</sup>	71	436	16.1
Home School Groups	61	436	13.8
Botanical Gardens	39	436	8.8
Juvenile Detention Center	11	436	2.5

<sup>1</sup>Descriptions of other included: preschool teacher, their own kids, special education teacher, 4-H group.

*Cooperative Extension Perceptions.* Three questions were asked pertaining to JMG’s relationship with Cooperative Extension. The respondents were asked three questions pertaining to Cooperative Extension. These questions included: (1) Do you utilize Cooperative Extension volunteers? (2) Have you ever utilized Cooperative Extension before your involvement with JMG? and (3) Do you consider your involvement in JMG to be a 4-H project? Table 4 shows the results to these questions.

**Table 4. Responses<sup>1</sup> to questions pertaining to Cooperative Extension.**

<b>Questions</b>	<b>Yes</b>	<b>Percentage</b>
Do you utilize Cooperative Extension Volunteers?	319	73.2%
Have you ever utilized Cooperative Extension before your involvement with JMG?	286	65.6%
Do you consider your involvement in JMG to be a 4-H project?	159	36.5%

<sup>1</sup>n = 442

A cross tab analysis was run to compare the three previously identified groups to determine the differences in responses for each of the three Cooperative Extension Programs. Group 3 (Cooperative Extension Group) revealed the highest percentage of utilizing Cooperative Extension volunteers and had the highest response in considering that JMG was a 4-H project. Only 16 of 121 respondents for Group 1 (school educators, private school educators, and school administrators) considered JMG to be a 4-H project.

**Table 5. Cross tab analysis of three groups comparing frequency and percentages of a yes response to three questions pertaining to Cooperative Extension.**

<b>Question</b>	<b>Group<sup>1</sup></b>	<b>Yes</b>	<b>Percentage</b>
Do you utilize Cooperative Extension Volunteers?	1	70	57.8%
	2	16	61.5%
	3	171	90.9%
Have you ever utilized Cooperative Extension before your involvement with JMG?	1	49	40.5%
	2	17	65.4%
	3	159	54.6%
Do you consider your involvement in JMG to be a 4-H project?	1	16	13.2%
	2	10	38.5%
	3	110	58.5%

<sup>1</sup>Group 1 was public school educators, private school educators, and school administrators (n = 121).

Group 2 was home school educators (n = 26)

Group 3 was Cooperative Extension employees, Master Gardeners, 4-H leaders, and other youth service employees (n = 188).

*Perceptions of the program.* Five questions/statements asked respondents to reveal their perceptions of the JMG Program based on a five-point Likert scaling system. The scale was 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neutral*, 4 = *Agree*, and 5 = *Strongly Agree*. The five questions/statements were: (1) JMG has enhanced the classroom or educational program, (2) JMG has increased interest in science, (3) JMG has established a more teamwork oriented atmosphere, (4) JMG has encouraged students to perform community service projects outside the classroom, and (5) JMG has encouraged students to perform community service projects outside the classroom. Over two-thirds of respondents said that they *Agree or Strongly Agree* to all statements. The highest percentage total and mean response was for the statement “JMG has enhanced the classroom/educational program.” The second highest percentage total and mean response was for the statement “JMG has increased interest in science. Table 6 reveals frequencies, percentages, mean responses, standard deviations, and the standard error of the mean for each of the five statements.



**Table 6. Frequencies, percentages, means, and standard deviations of Likert-scale responses<sup>1</sup> for these five statements.**

Statement	Frequency and Percentages of Agree & Strongly Agree	Mean	SD	SEM
JMG has enhanced the classroom or educational program.	347 (85.5%)	4.18	.89	.04
JMG has increased interest in science.	347 (85.3%)	4.17	.90	.04
JMG has established a more teamwork oriented atmosphere.	291 (71.5%)	3.95	.91	.04
JMG has encouraged students to perform community service projects outside the classroom.	283 (69.5%)	3.94	.95	.05
JMG has encouraged students to perform community service projects outside the classroom.	275 (67.7%)	3.84	.90	.05

<sup>1</sup> Likert-scale was defined as 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neutral*, 4 = *Agree*, and 5 = *Strongly Agree*.

An additional analysis was performed to compare the three educational groups on these five statements. The idea was determine if there are significant differences of perceptions between the groups. A one way analysis of variance was performed to measure these differences. A post hoc analysis did reveal differences between the three groups for the five statements. Therefore, an L.S.D. post hoc analysis was conducted to measure differences. Group 1 (public school educators, private school educators, and school administrators) revealed the lowest mean response for each of the five statements. This group also revealed significantly lower mean responses ( $p \leq 0.05$ ) when compared to at least one of the groups for the statements “JMG has enhanced the classroom or educational program,” “JMG has increased interest in science,” and “JMG has encouraged students to perform community service projects outside the classroom.” Only two statements (“JMG has encouraged students to perform community service projects outside the classroom” and “JMG has encouraged students to perform community service projects outside the classroom”) revealed no significant differences ( $p \leq 0.05$ ) between any of the three groups. Table 7 displays the group means for each of the five statements.

**Table 7. Group<sup>1</sup> mean Likert-scale responses<sup>2</sup> to five perceptual statements pertaining to JMG.**

Statement	Mean Responses for Each Group <sup>3</sup>		
	Group 1	Group 2	Group 3
JMG has enhanced the classroom or educational program.	4.05 <sup>a</sup>	4.50 <sup>b</sup>	4.28 <sup>b</sup>
JMG has increased interest in science.	4.07 <sup>a</sup>	4.38 <sup>ab</sup>	4.28 <sup>b</sup>
JMG has established a more teamwork oriented atmosphere.	3.92 <sup>a</sup>	4.08 <sup>a</sup>	4.05 <sup>a</sup>
JMG has encouraged students to perform community service projects outside the classroom.	3.72 <sup>a</sup>	4.19 <sup>b</sup>	4.12 <sup>b</sup>
JMG has encouraged students to perform community service projects outside the classroom.	3.75 <sup>a</sup>	4.08 <sup>a</sup>	3.93 <sup>a</sup>

<sup>1</sup> Group 1 was public school educators, private school educators, and school administrators (n = 121).

Group 2 was home school educators (n = 26).

Group 3 was Cooperative Extension Employees, Master Gardeners, 4-H leaders, and other youth service employees (n = 188).

<sup>2</sup> Likert scale was defined as 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neutral*, 4 = *Agree*, and 5 = *Strongly Agree*.

<sup>3</sup> From the LSD test, means within rows not sharing same letter differ significantly at  $p \leq 0.05$ .

*Other observational perceptions of youth participants.* The next section focused on five other statements concerning youth participants. The five statements were: (1) as a result of the JMG program, youth are likely to continue participating in community service projects in the future, (2) youth tried new fruits and vegetables, (3) youth showed an increase in pride and personal responsibility, (4) youth were more enthusiastic about learning, and (5) JMG improved nutritional attitudes of the youth. Table 8 reveals frequencies, percentages, mean responses, standard deviations, and the standard error of the mean for each of the five statements.

**Table 8. Frequencies, percentages, means, and standard deviations of Likert-scale responses<sup>1</sup> for these five statements.**

Statement	Frequency and Percentages of Agree & Strongly Agree	Mean	SD	SEM
Youth are likely to continue participating in community service projects in the future.	228 (73.1%)	3.94	.80	.05
Youth tried new fruits and vegetables.	198 (63.8%)	3.83	.83	.05
Youth showed an increase in pride and personal responsibility.	249 (80.6%)	4.07	.74	.05
Youth were more enthusiastic about learning.	260 (83.8%)	4.21	.73	.04
JMG improved nutritional attitudes of the youth.	178 (57.8%)	3.69	.76	.04

<sup>1</sup> Likert-scale was defined as 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neutral*, 4 = *Agree*, and 5 = *Strongly Agree*.

The highest mean response for this section was for the statement “youth were more enthusiastic about learning” (4.21), followed by a mean response of 4.07 for the statement, “Youth showed an increase in pride and personal responsibility.” Again, a follow-up host hoc comparison was measured comparing the three group responses. No significant differences were revealed.

*Chapter analysis.* The respondents were asked to provide their opinion related to the overall usefulness of the eight chapters. The eight chapters were: Chapter 1–Plant Growth and Development, Chapter 2–Soils and Water, Chapter 3–Ecology and Environmental Horticulture, Chapter 4–Insects and Diseases, Chapter 5–Landscape Horticulture, Chapter 6–Fruits and Nuts, Chapter 7–Vegetables and Herbs, and Chapter 8–Life Skills and Career Exploration. Mean responses for all eight chapters were very high ranging from 4.38 to 4.65 on a five point Likert scale of usefulness (Likert-scale was defined as 1 = *Not Useful At All* to 5 = *Very Useful*).

**Table 9. Frequencies, percentages, means, and standard deviations of Likert-scale responses<sup>1</sup> on the usefulness of the chapters in level one of the curriculum.**

Chapter	Frequency and Percentages of Useful & Very Useful	Mean	SD	SEM
Chapter 1–Plant Growth and Development	378 (91.1%)	4.65	.69	.04
Chapter 2–Soils and Water	258 (87.0%)	4.55	.75	.04
Chapter 3–Ecology and Environmental Hort.	263 (88.2%)	4.54	.75	.04
Chapter 4–Insects and Diseases	269 (91.2%)	4.61	.69	.04
Chapter 5–Landscape Horticulture	244 (83.6%)	4.47	.81	.05
Chapter 6–Fruits and Nuts	246 (85.1%)	4.49	.82	.05
Chapter 7–Vegetables and Herbs	262 (90.7%)	4.61	.70	.04
Chapter 8–Life Skills and Career Exploration	245 (80.8%)	4.38	.93	.05

<sup>1</sup> Likert-scale was defined as 1 = *Not Useful At All* Useful to 5 = *Very Useful*.

An additional analysis was performed to compare the three educational groups. A one way analysis of variance was performed to measure these differences. A post hoc analysis did reveal differences between the three groups for the eight chapters. Therefore, an L.S.D. post hoc analysis was conducted to measure differences. Group 1 (public school educators, private school educators, and school administrators) revealed the lowest mean response for seven of the eight chapters. Only group 3 (Cooperative Extension) was lower on chapter 7. Group 1 also revealed significantly lower mean responses ( $p \leq 0.05$ ) when compared to at least one of the groups for chapters 1, 2, 3, and 7.

**Table 10. Group<sup>1</sup> mean Likert-scale responses<sup>2</sup> to five perceptual statements pertaining to JMG.**

Statement	Mean Responses for Each Group <sup>3</sup>		
	Group 1	Group 2	Group 3
Chapter 1–Plant Growth and Development	4.59 <sup>a</sup>	4.96 <sup>b</sup>	4.65 <sup>a</sup>
Chapter 2–Soils and Water	4.51 <sup>a</sup>	4.91 <sup>b</sup>	4.56 <sup>a</sup>
Chapter 3–Ecology and Environmental Hort.	4.41 <sup>a</sup>	4.74 <sup>b</sup>	4.57 <sup>ab</sup>
Chapter 4–Insects and Diseases	4.45 <sup>a</sup>	4.87 <sup>a</sup>	4.62 <sup>a</sup>
Chapter 5–Landscape Horticulture	4.43 <sup>a</sup>	4.65 <sup>a</sup>	4.41 <sup>a</sup>
Chapter 6–Fruits and Nuts	4.38 <sup>a</sup>	4.70 <sup>a</sup>	4.48 <sup>a</sup>
Chapter 7–Vegetables and Herbs	4.49 <sup>a</sup>	4.87 <sup>b</sup>	4.64 <sup>ab</sup>
Chapter 8–Life Skills and Career Exploration	4.41 <sup>a</sup>	4.48 <sup>a</sup>	3.42 <sup>a</sup>

<sup>1</sup> Group 1 was public school educators, private school educators, and school administrators (n = 121).

Group 2 was home school educators (n = 26).

Group 3 was Cooperative Extension employees, Master Gardeners, 4-H leaders, and other youth service employees (n = 188).

<sup>2</sup> Likert scale was 1 = *Not Useful At All* to 5 = *Very Useful*.

<sup>3</sup> From the LSD test, means within rows not sharing same letter differ significantly at  $p \leq 0.05$ .

*Other information.* The researchers also wanted to find out some general information on educational trainings. One hundred-ninety six of 433 (45.7%) had participated in a Cooperative Extension JMG training. In addition, 99 of 403 (24.6%) said that they have utilized the County Extension Office in their area to help with educational programming. However, 33.3% reported that they had never used their county Extension office.

The researchers attempted to ascertain which specific book curriculum and other educational resources were the program coordinators using to implement JMG. The majority of respondents indicated that they are using the level 1 trainer guide and youth handbook (65.5% and 55.1%, respectively). Also, 41.1% noted that they use the JMG website for information. Table 11 reveals these results.

**Table 11. Frequencies and percentages from respondents on curriculum use from respondents<sup>1</sup>.**

Questions	Yes	Percentage
Are you using the teacher/leader guide – level 1	283	65.5%
Are you using the youth handbook - level 1?	238	55.1%
Are you using the golden ray series?	84	19.4%
Are you using the JMG website?	179	41.4%
Are you using recognition medals?	49	11.3%
Are you using certification certificates?	94	21.8%

<sup>1</sup>n = 432

## Discussion

*Objective 1.* Objective 1 was to determine the demographic information on the program coordinators. The original database consisted of 4,011 names. Only 442 (11.02%) responded to the online survey. This low response can be attributed to a couple of points. Firstly, this database consisting of 4,011 names was generated from four years of educators who had one point or another said they were interested in the program. It was

not a database of known JMG users. A second factor for the low response rate can be attributed to the fact that it was an online survey. If participants were unable to access the Internet, then they were unable to complete the survey.

Of the 442 that did respond, public school teachers were the highest percentage (26.5%) followed by Cooperative Extension employees (20.9%), and Master Gardeners (12.2%).

Another question within objective one was to determine how these program coordinators first became aware of JMG. Cooperative Extension and attended trainings (combined 53.7%) were the most predominant responses.

*Objective 2.* The second objective was to determine what teaching methods were being used to implement the curriculum. The classroom, after school programs, and youth clubs accounted for 452 responses. Seventy-three percent of the respondents said that they used volunteers to help implement the program. However, when comparing the three defined group responses to volunteer use (Table 5), Group 1 (public school educators, private school educators, and school administrators) revealed a much lower percentage for using volunteers than group 2 (home school educators) and group 3 (Cooperative Extension) (57.8% versus 61.5% and 90.9%, respectively).

Also in Table 5, the respondents were asked if they considered their involvement in JMG to be a 4-H project. A low percentage (13.2%) of public school educators, private school educators, and school administrators considered the JMG program to be a 4-H program. The percentage rose to 38.5% for group 2 (home school educators) and 58.5% for group 3 (Cooperative Extension).

*Objective 3.* Objective three was included to measure the perceptions of program coordinators concerning the curriculum's objectives and content on youth. Also, it attempted to measure the impact the curriculum leaves on youth participants.

Respondents indicated that they agreed to the statements (1) JMG has enhanced the classroom or educational program (mean = 4.18), (2) JMG has increased interest in science (mean = 4.17), (3) JMG has established a more teamwork oriented atmosphere (mean = 3.95), (4) JMG has encouraged students to perform community service projects outside the classroom (mean = 3.94), and (5) JMG has encouraged students to perform community service projects outside the classroom (mean = 3.84). The scale was 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neutral*, 4 = *Agree*, and 5 = *Strongly Agree*. This indicates that these respondents do think the program is helping their students both academically and through development of life skills.

A post hoc analysis did reveal differences within the three groups for these same five statements (Table 7). Group 2 (home school educators) displayed the highest mean responses for all five statements, followed by group 3 (Cooperative Extension) and then by group 1 (public school educators, private school educators, and school administrators).

An additional five statements were asked that were more focused toward youth behaviors (Table 8). The five statements with their mean responses in parenthesis included: (1) as a result of the JMG program, youth are likely to continue participating in community service projects in the future (mean = 3.94), (2) youth tried new fruits and vegetables (mean = 3.83), (3) youth showed an increase in pride and personal responsibility (mean = 4.07), (4) youth were more enthusiastic about learning (mean = 4.21), and (5) JMG improved nutritional attitudes of the youth (3.69). The Likert-scale was defined as 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neutral*, 4 = *Agree*, and 5 = *Strongly Agree*. These results follow similar findings from Cavaliere (1987), Wallczek and Zajicek (1998), and Lineberger (1999).

The final component of objective three measured the thoughts and perceptions of respondents on the usefulness of the curriculum (Tables 9 and 10). The eight chapters in the level 1 curriculum were specifically identified to measure. Mean values were very high for all eight chapters (mean range from 4.38 to 4.65 on a 1 to 5 scale, where 1 = *Not Useful At All* to 5 = *Very Useful*). This indicates that respondents found these chapters very useful. However, it is also worth noting that group 1 (public school educators, private school educators, and school administrators) had the lowest mean response for seven of the eight chapters.

## **Conclusions**

Overall, the results indicate that respondents are very satisfied with the program. For the first time, JMG personnel now have documented results that will help them be more effective in meeting the needs of JMG program coordinators.

As a result of these data, the following recommendations have been developed for JMG personnel:

- A more reliable database should be created to more effectively distinguish active JMG groups from non-active groups. This database could also be used to provide JMG updates and for future studies utilizing program coordinators.
- JMG personnel should continue to present programs at educator conferences and trainings. Respondents noted that this was how they first became aware of the program. They also said that these trainings were effective for them and helped them to adopt the program with the youth they serve.
- JMG must be more effective at communicating the fact that JMG is a 4-H project. Even though the 4-H Clover is on curriculum, program coordinators do not appear to be connecting the JMG to 4-H.
- Overall, public and private school educators did have lower mean responses concerning the impact of the JMG program and the curriculum in general. Further studies should be developed specifically for this audience to determine how JMG can more effectively meet their educational needs.

**Literature Cited (These should all have hanging indents)**

Cavaliere, D. (1987). How zucchini won fifth-grade hearts. *Children Today* 16(3), 18-21.

Dillman, D. (2000). *Mail and Internet surveys: The tailored design method (2<sup>nd</sup> ed.)*. New York: John Wiley & Sons, Inc.

Ladner, D., Wingenbach, G., & Raven, M (2002). Internet and paper-based data collection methods in agricultural education research. *Journal of Southern Agricultural Education Research* 52(1), 40-51.

Lineberger, S (1999). *The effect of school gardens of children's attitudes and related behaviors regarding fruits and vegetables*. Unpublished masters thesis, Texas A&M University, College Station.

Skelly, S., & Zajicek, J. (1998). The effect of an interdisciplinary garden program on the environmental attitudes of elementary school students. *Hort Technology* 8(4): 579-583.

Wallczek, T., & Zajicek, J. (1998). The effect of a school garden program on self-esteem and interpersonal relationships of children and adolescents. *Hort Technology* (submitted)

## **Appendix A: How did you first hear about JMG?**

- Public School Teacher
- Cooperative Extension Employee
- Master Gardener
- Other1
- 4-H Leader
- Home School Curriculum Coordinator
- Horticulture Professional
- Parent
- Youth Service Employee
- School Administrator
- Private School Teacher
- Master Gardener Training
- Convention
- I attended a conference last summer for TRSI and there were presenters at a session
- CAST, Austin, TX
- Attended training at National MG conference in San Antonio
- Flyer sent to school
- Conference on children's gardening held in held in Denver, CO by American Hort. Society
- CAST Science Convention
- Charles
- School gardening conference
- Americorp Volunteer
- Americorp Volunteer
- Who is a master gardener himself and a 4-H project leader for our county.
- Former co-worker used to use it.
- The extension office did a presentation at our faculty meeting and asked any interested teachers to contact them and they would set up appointment times to meet with us and present lessons to our classes.
- Worked with summer camp using JMG
- Texas Science Teachers Convention Austin, TX
- 4-H Program
- The JMG Program was presented at an Extension educator staff development meeting.
- A teacher I was attending a technology training with participates in JMG. When we started discussing our interest in gardening with our classes, she told me about JMG and showed me when a training would be offered in our area.
- Susan Hastings is involved in the Master Gardener program in Duval County Florida- she has a son in my class and shared with me the JMG kids program.
- CAST Conference
- Co-worker in Extension
- We attended a youth gardening conference in East Lansing, Michigan and attended a presentation by Dee McKenna. Took this information back to the education director of



the Buffalo/Erie county Botanical Gardens and she helped us get in touch with Barb Bake.

- Mini CAST
- Attended a brief presentation about the program by Susan Gloeckler at a small teach conference in Temecula, CA.
- Workshop
- Illinois State JMG Office email
- I was introduced to the JMG program when I began working at The Oregon Garden. I coordinate family programs and the JMG program is a perfect fit.
- Presented at a school district symposium.
- Conference.
- booth at a gardening education conference in Austin.
- The program was passed onto me in its preliminary stages from my predecessor.
- Marva Beck.
- Haltom City Beautification representative.
- NGA Children's Garden Symposium 2001
- A Master Gardener told me about the program.
- I attended the International MG Conference in San Antonio.
- JMG curriculum writing contest
- Homeschool conference
- Master Gardener Newsletter.
- My mom
- Received this green mailing postcard.
- I am the teach of gifted students at Idylwild Elementary School. One of my student's father is the Statewide Master Gardener Coordinator at the University of Florida.
- At the Home School Convention at the George R. Brown Convention Center on 4/19 & 4/20
- Penn State Master Gardener Steering Committee.
- National Youth Garden Symposium last year in Ann Arbor, MI
- At a children's gardening conference.
- AHS Youth Garden Symposium exhibit & workshop
- University of Illinois Master Gardener 2001 Annual Conference
- National School Gardening Symposium
- National 4-H publication magazine.
- Master Gardeners who had been exposed to JMG in Texas
- Additional information from the MG conference
- Attended the National Youth Garden Symposium last summer at Michigan State University
- Southwest gardening conference
- International MG Conference?
- Master gardener training
- From a master gardener
- Through Master Gardeners program
- The Hansen Trust, Santa Paula, CA
- State Conference
- November issue of Wallace Farmer magazine, page 20

- I went to the first Environmental Conference held by TRSI in Jefferson TX in July 2000. The presentation was dynamic!
- Master Gardener Contention
- Representative from Texas A&M did presentation to our group.
- Teachers at my school.
- Education conference at Michigan State 7/01
- Texas Master Gardener Program
- Bexar County Master Gardener Program
- CAST 2001 A Science Odyssey
- Mail
- Texas Home School Convention
- Through TAMU
- CAST
- Clark County Fair

**Appendix B:**  
**Which one best describes your role in the JMG Program- OTHER**

- Homeschooling parent, Master Gardener
- Chairperson for DIGGS (during and after school gardening program), parent and master gardener.
- As the Science teacher for grades 1-4, I have developed an outdoor learning center that supports the TAKS in Science and Texas History for grade 4.
- Viewer
- School garden coordinator/facilitator
- Summer camp/nature educator, summer camp administrator
- Youth Garden Teacher
- I am a school secretary and am also in charge of our school garden.
- South Texas AmeriCorps Initiative Member
- I am also a Master Gardener
- I work for National Wildlife Federation as an Education Coordinator in our San Diego office.
- Botanical garden educator
- Youth Nutrition Program Coordinator for the County Health Department
- I am a city-employed environmental educator.
- 4-H Camp program
- Botanic Gardens Children's Program Manager
- Education coordinator at botanical gardens.
- Student of Horticulture at Temple University.
- I designed and maintain a children's garden at our local church/daycare.
- State coordinator for LA master gardening.
- Master Gardener
- School Secretary
- Botanical garden educator
- Brownie troop leader, Pre-school board of directors/curriculum planning
- Builders Club sponsor and a public school teacher
- STACI member
- Substitute teacher, former cubscout leader
- Kid who helps mom in garden
- I work for a non-profit organization that is membership based in this field
- Historic Landscape administrator
- I am a teacher in an administrative position and also a horticulture 4-H leader
- I do gardening projects with the Diabetes Program at the Pueblo of Santa Ana
- I participated in the class as my local 4-H/coop. extension. (If this is how they submitted it, don't change it)
- Master Gardener who teaches a junior master gardening program and is also an extension employee
- I am an Advanced Master Gardener and work with 200 pre schoolers with youth gardens.
- Community Education teacher working within school district providing classes for home schoolers.

- I started a Youth Community Garden on my property as a service project. I am a psychotherapist who works within the Fannin County schools with special needs children. I believe that nature and horticulture are a wonderful laboratory for teaching social
- 4-H youth leader, Adv. Master Gardener and Cooperative Extension Employee
- State MG Coordinator, Horticulture faculty
- Worked to form the first (and so far, the only) JMG in our state, where I serve as the JMG group leader.
- Private Foundation
- Garden Writer
- We are building a garden learning center at our nonprofit facility and wish to implement JMG as our curriculum
- Comprehensive School Health Specialist
- I volunteer as a garden teacher at an inner city school
- Received mail
- We obtained a CYD grant for our area code 76707
- Youth Service volunteer- Girl Scouts
- I have participated in the Master Gardener training (last summer) and I am also a public school administrator and working with an after-school program.
- I have attended Master Gardener training (last summer) and am also a school administrator working with youth in an after school program.

## **Appendix C:**

### **What types of audiences are using JMG Curriculum- Other**

- Preschool children
- Right now with my own children- would like to start an after school program
- Summer programming
- I do not currently use your curriculum
- Applying for a grant to begin a program now
- Community School Program
- State MA/MR/SA Hospital (Adolescent Population)
- State MA/MR/SA Facility (Adolescent Population)
- Special ed ED Students
- Summer community garden run by master gardeners working with 4-H community clubs
- Junior College Summer Program
- Community garden club
- Youth Garden Program
- Grant at Youth Resource Center and Homeless Shelter, FNP funded, so with low-income kids.
- 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> grade Science Club Students
- Not using it currently- but would like to use it with after school programs or programs we do in conjunction with local Botanical Garden.
- Summer Youth Garden Groups
- Summer Garden Program
- I am starting by doing the projects with my son, who is 9. He is a 4-H member enrolled in Horticulture. After I have some experience, I plan to find ways to incorporate gardening into the nutrition classes I teach for youth
- 4-H club
- My children
- However we have yet to meet or actually do anything yet. But, are very interested.
- Nutrition program and possibly summer day camp
- Not currently using JMG- but interested in collaborating (NWF and JMG may already be talking?)
- 4-H group
- child
- home use
- 4-H club
- my kids
- am not using the program at this time
- Not sure yet, waiting on formation of group.
- Summer camp 2002
- Have not used. Just learned about it.
- day camp participants
- 4-H youth home club.
- Campers ages 6-16
- Personal

- We haven't yet used JMG curriculum
- I do want to note that we have one student that is not a homeschooler. We are open to members other than homeschoolers.
- I am not using the curriculum
- Summer school program
- Home for my own 2 children
- Summer break in school
- Currently, I'm trying to get a community garden started. I haven't had the opportunity to work with JMG up to now. Though I didn't fill out the questionnaire I believe JMG would be an asset to learning.
- My own learning
- None, this is the first time I've heard of this program
- All available during summer
- Campus projects with various grade levels
- For now, my own children only.
- Continuing education.
- Children's Home, Summer programming.
- My children and their friends have a summer garden club that we work through the JMG activities heading towards the JMG cert.
- Currently, we are not using the JMG curriculum, but would be interested in more information.
- It has been two years since I have taught a session, but at that time it was done as a community announce opportunity
- Children's Gardening Workshops
- Programs at the extension office and some local libraries.
- Will be using at summer success program this summer
- Anyone between the ages of 4-14 can participate. The only requirement is that a parent of family friend/relative must also be involved with the child. I facilitate meetings. A Junior Master Gardener, Richard Danner, serves as a consultant to the group.
- Neighborhood kids, library talks for kids.
- Summer school program
- Public library classes
- Summer school program
- Summer camp
- Libraries
- Summer park and rec classes
- Club called, the Junior Naturalists
- Working towards using with a home school group
- Summer day camp
- Not currently using JMG, but would like to
- 4-H club
- 4 week summer camp