

2008 South Carolina School Garden Survey Results

**South Carolina Department of Agriculture
Laura Greenwold Derks**

31 October, 2008

The problem of childhood obesity in South Carolina has become an issue of serious concern to Hugh Weathers, Commissioner of Agriculture, and the South Carolina Department of Agriculture. The development and establishment of school gardens has the potential to increase students' interest in fresh fruits and vegetables, understanding of where food comes from, appreciation of agriculture, and development of healthier eating and physical activity habits. Therefore, the Department has been interested in exploring and developing its resources to encourage the statewide implementation of school and community gardens.

School gardens can have valuable benefits, offering an environment conducive to demonstrating a variety of lessons, extending the curriculum to hands-on activities and providing a learning opportunity that goes beyond textbooks alone. Also, a school garden can offer fresh produce for students to enjoy and in which they can take pride/take ownership of. Previous research shows that school gardens can have an impact on students' interest in fruits and vegetables. According to one article, "children and gardens are a natural fit. Gardens furnish a context for play, investigation, experimentation, and imagination"(1). A study of California schools found that most principals considered school gardens an effective way to enhance academic instruction (2). Other studies indicate that school gardens can have a positive impact on students' preferences and consumption of fruits and vegetables (3-5).

This survey shows the impact school gardens have in South Carolina. The survey questions and responses fall under four different categories: type of garden, activities carried out in the garden, garden costs, and garden assessment.

The survey was sent to 175 South Carolina schools both public and private. The survey was targeted to schools potentially having a garden, based on information from the following resources: SC Wildlife Federation (132 schools), kidsgardening.org (25 schools), SC Green Steps Schools (8 schools), Greenville Organic Foods Organization (7 schools), Clemson Landscapes for Learning (5), as well as SC Department of Education annual school reports (14 schools). Individuals eager to share information about other school gardens around the state were a valuable resource as well.

Of the 175 surveys sent out, 51 schools returned a response by mail; 46 of which gave contact information. 4 responses were from schools with a garden but no contact information. 42 schools sent back an online response; 26 of which gave contact information. 9 responses were from schools with a garden but no contact information. Four of the schools giving contact information responded by both mail and email.

Contact information was important to the survey; without eliminating the survey responses that provided no contact information there would be no way to determine whether one school responded more than once, which would distort the survey results. 21 schools did not include contact information; 13 of these did have gardens (58%), of which only 6 of these completed the survey. Therefore information from 6 school gardens is not included in the following results. (The rate of including contact information was

lower for the online responses; participants were probably more wary of giving contact information out online than they were through mail.)

Out of the 89 schools that returned responses to the survey (a response rate of 51%), 68 schools included contact information (76%). 53 of these schools have a garden (60% of responses), 12 do not have a garden but are interested in starting one up (13%), and 3 have no garden and no interest (3%). Except where noted, the percentages in parentheses that follow in this report are calculated for the total number of applicable responses out of the total 53 school gardens.

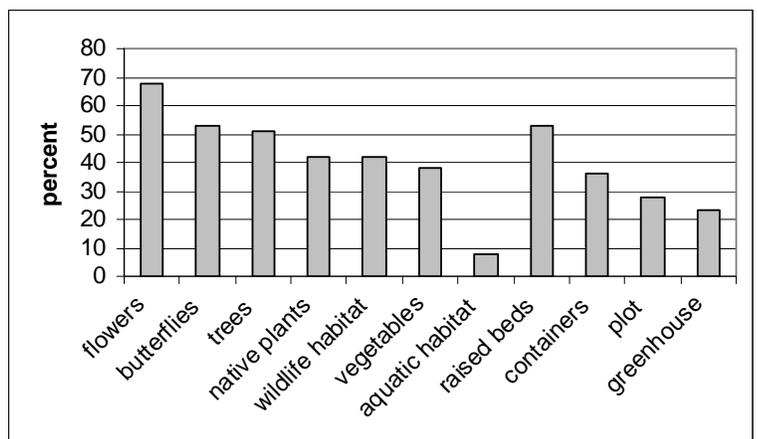
Of the 53 total schools with gardens that listed contact information, school gardens were found in 21 of the 46 SC counties (46% of total counties). Of the school gardens found in this survey, 8 school gardens (15% of total school gardens) are in Richland County. Greenville County has 7 school gardens (13%). Anderson County has 6 (11%), while Lexington County follows with 4 (8%). Oconee, Spartanburg, York, Orangeburg, and Clarendon counties each have 3 school gardens (6%). Pickens County has 2 school gardens (4%), and one school in each of the following 11 counties has one garden: Saluda, Greenwood, Lee, Sumter, Dillon, Aiken, Florence, Georgetown, Colleton, Charleston, and Beaufort (2%).

The majority, 25 of the 53 school gardens determined from this survey, are from 7 counties in the upstate, which includes Oconee, Pickens, Greenville, Spartanburg, York, Anderson, and Greenwood (47%). 18 schools (34%) are from 6 counties in the midlands: Saluda, Lexington, Richland, Sumter, Aiken, and Orangeburg. 6 schools (11%) are from 4 counties in the lowcountry: Clarendon, Colleton, Charleston, Beaufort. 4 schools (8%) are from 4 counties in the Pee Dee: Lee, Dillon, Florence, Georgetown. It is important to keep in mind, however, the potential existence of school gardens from these and other counties that did not participate in the survey.

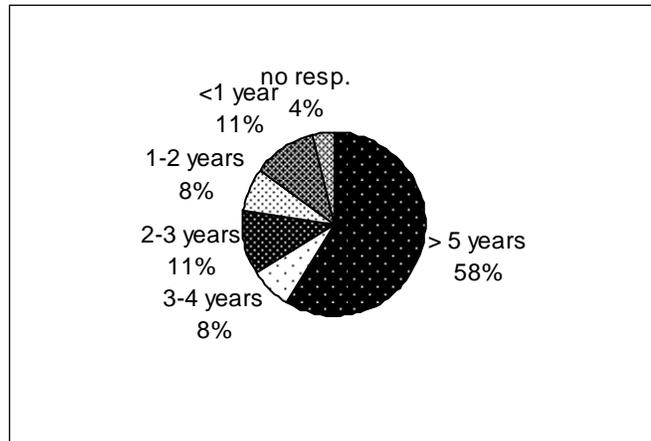
Of the 11 school gardens in the survey that do not have a garden but do have interest, 8 (72%) are from 6 counties in the upstate: Laurens and Spartanburg with 2 interested schools, and Pickens, Anderson, York and Greenwood with 1 interested school. Two interested schools (18%) are in 2 counties in the midlands: Richland and Lexington. One interested school (9%) is located in the Pee Dee county of Marion.

Type of Garden:

Flowers were the most prevalent feature of school gardens, at 36 schools (68%); 28 schools had a feature to attract butterflies (53%); 27 had trees (51%); 22 had native plants (42%); 22 had wildlife habitats (42%); 20 indicated vegetables (38%); 4 had aquatic plants or an aquatic habitat (8%). As for the structure of the garden, 28 school gardens had raised beds as a component (53%); 19 had containers (36%); 15 had plots (28%); 12 had greenhouses (23%).



The majority of gardens (60%) are older than 5 years old (32 gardens); 4 gardens were between 3 and 4 years old (7%); 6 were between 2 and 3 years old (11%); 4 were 1-2 years old (7%); 6 were less than 1 year old (11%).



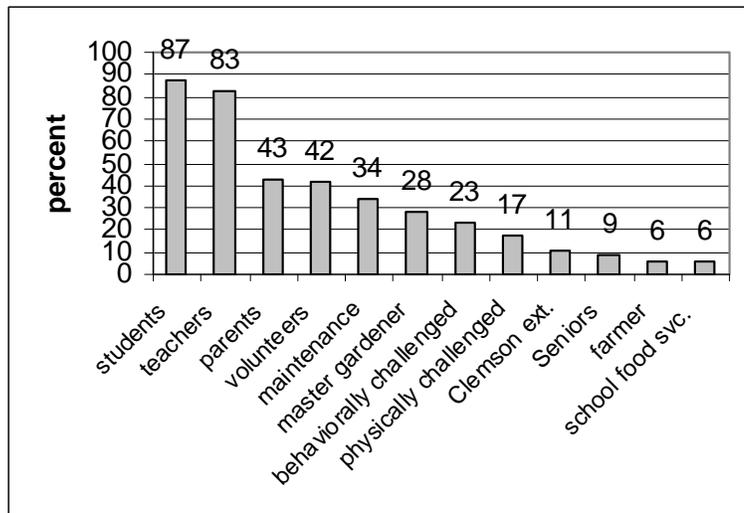
No size garden is most prevalent: 12 gardens were less than 100 square feet (23%); 14 were 100<500 square feet (26%); 14 were 500<1000 square feet (26%); 10 were greater than 1000 square feet (19%). Though there are the fewest gardens larger than 1000 square feet.

26 schools responded that the garden had an irrigation system/sufficient water source (49%). 25 responded that they did not (47%). This question may not give an accurate depiction though, because a 'no' response could indicate the absence of one but the presence of the other.

16 schools have a composting system (30%); 36 do not (68%). Of the 16 gardens that composted, 13 grew vegetables. Also, of the 20 schools that grew vegetables, 13 have a composting system, while only 3 of the schools without vegetables have a composting system.

Activities:

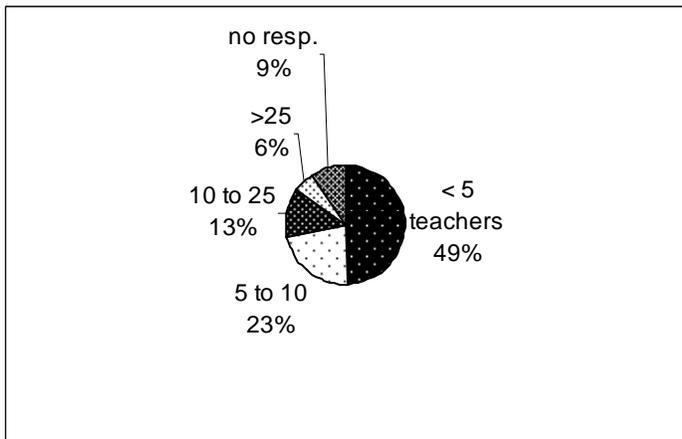
Most schools (46) responded that students participate in the garden (87%), meaning the school offers opportunities for students to interact with the garden in some way. 44 schools responded that teachers participate (83%). In 23 schools parents participate (43%); community volunteers participate in the garden at



22 schools (42%). Maintenance staff participates in 18 school gardens (34%). A master gardener participates in 15 school gardens (28%). Behaviorally challenged persons participate in 12 gardens (23%), physically challenged persons participate in 9 gardens (17%), and a Clemson extension agent participates in 6 schools (11%). Seniors participate in 5 school gardens (9%). A farmer participates in 3 school gardens (6%). School food service participates in 3 schools (6%). One school each listed one of the following participants: Garden club, Girl Scouts, group home staff, Eat Smart Move More SC, youth advisory council on nutrition, NHS, and Beta Club.

During the summer, the school gardens are maintained by school administrators or teachers at 24 schools (45%); at 17 schools maintenance or custodial staff help maintain the garden (32%). Volunteers help maintain 7 school gardens during the summer (13%). Students help maintain the garden at 6 schools (11%), parents help at 6 schools (11%), and seniors at 3 schools (6%).

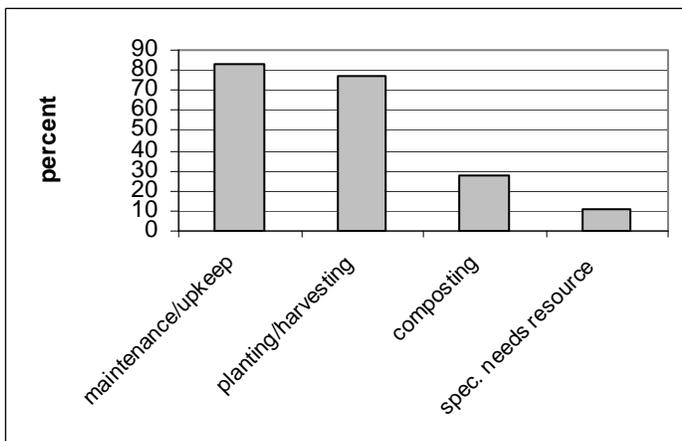
At 26 schools (49%), between 1 and 5 teachers are involved with the garden. Between 6 and 10 teachers are involved at 12 schools (23%), and 7 schools have between 11 and 25 teachers involved (13%). One school has 30 teachers, one school has 35, and one school has 58 teachers involved.



Students at the pre-kindergarten to fifth grade level are involved in the garden at 38 schools (72%). Students at the sixth to eighth grade level are involved in the garden at 10 schools (19%). Students at the ninth to twelfth grade level are involved in the garden at 6 schools (11%). It is mostly elementary schools that have gardens (38 schools, or 68%). Seven middle schools have gardens (13%), and 4 high schools have gardens (8%). Three schools have students from all grades (6%). One private school involves kindergarteners through twelfth graders, and another involves middle and high school students.

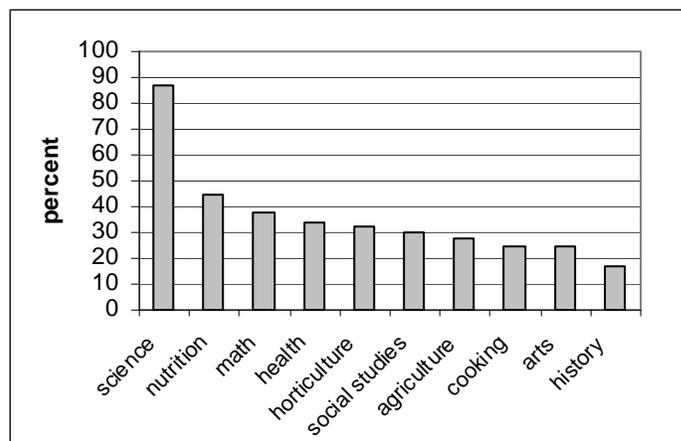
(It may be important to note that the percentages of student grade participation roughly correspond to the percentages of the grade levels of the schools that received the survey.)

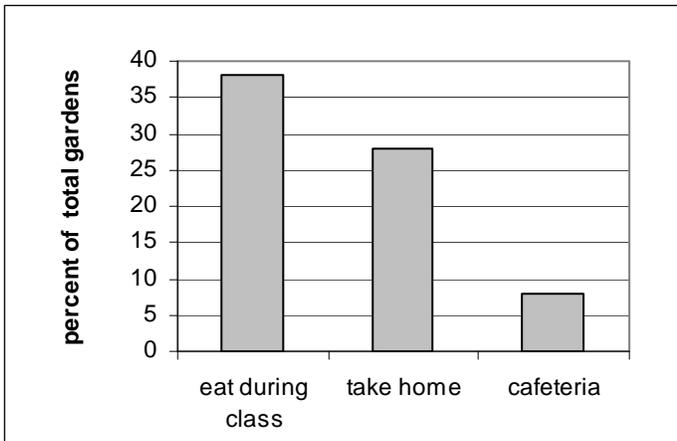
Students at 18 schools spent one hour or less in the garden per week (34%). Students at 15 schools spent between two and four hours per week in the garden (28%). Students at 8 schools spend five or more hours in the garden per week (15%). Only 40 schools gave responses for time spent in the garden (75%); it could be difficult to estimate time spent in the garden.



When students are in the garden, they participate in a variety of ways. Students at 44 schools are involved in maintenance/upkeep (83%). Students at 41 schools are involved in planting/harvesting (77%). Students at 15 schools are involved in garden composting (28%), while the garden serves as a resource for special needs students at 6 schools (11%).

School gardens serve as a launch-pad for a variety of lessons, as well. Science lessons are taught in 46 of the gardens (87%), nutrition in 24 gardens (45%), math in 20 (38%), health lessons in 18 (34%), horticulture in 17 (32%), social studies in 16 (30%), agriculture in 15 (28%), cooking in 13 (25%), arts in 13 (25%), and history in 9 (17%).

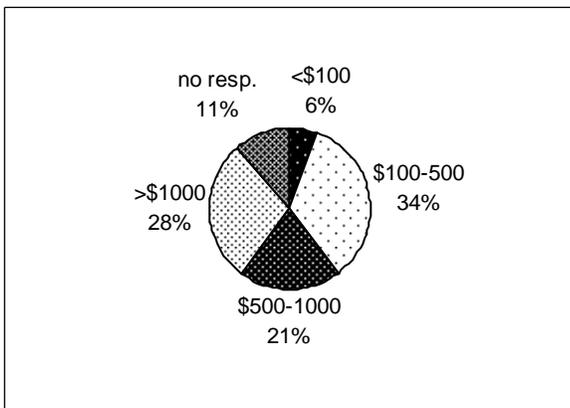




Of the 28 school gardens that have produce (53% of total), 20 schools eat during class (38%), 15 take produce home (28%), and 4 schools use the produce in the cafeteria (14%). One school gives produce to a shelter, one sells produce at a farmers market, one makes stone soup after the story, and one school said that in the past they prepared lunch for parents with the garden produce.

28 schools (53%) responded that the community beyond the school is connected with or involved in the garden, describing mostly community volunteers and grants or donations from the community. One school gives produce to Meals on Wheels, one school garden appears in a newspaper article, and another school has a plant sale.

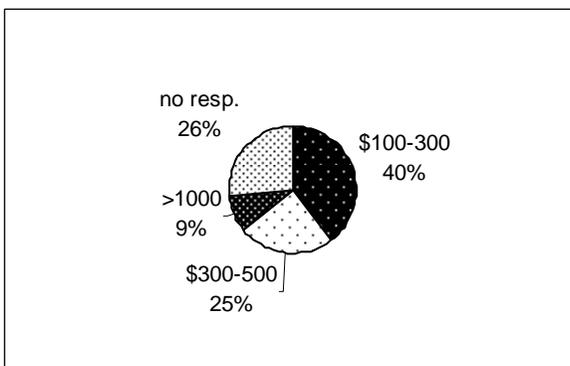
Costs:



Start-up costs for the garden were less than \$100 for 3 schools (6%). 18 schools started a garden with \$100 to \$500 (34%). 11 schools started a garden with \$500 to \$1000 (21%). 15 schools began a garden with more than \$1000 (28%).

The estimated annual cost for the garden is between \$100 and \$300 for 21 schools (40%). For 13 schools, the estimated annual cost is between \$300 and \$500 (25%). Three schools spend \$1000 in annual costs (6%), while one school estimated \$1500 and another estimated \$2000.

The sources of funding and materials for the gardens came from grants for 30 schools (57%), from teacher personal funds for 26 schools (49%), from PTA for 26 schools (49%), from garden supply donations for 25 schools (47%), from donations of money for 22 schools (42%), from the school budget for 17 schools (32%), from parent funds for 10 schools (19%), from recycled material for 9 schools (17%), from fundraisers for 8 schools (15%), from found material for 7 schools (13%), and from FFA for 3 schools (6%).

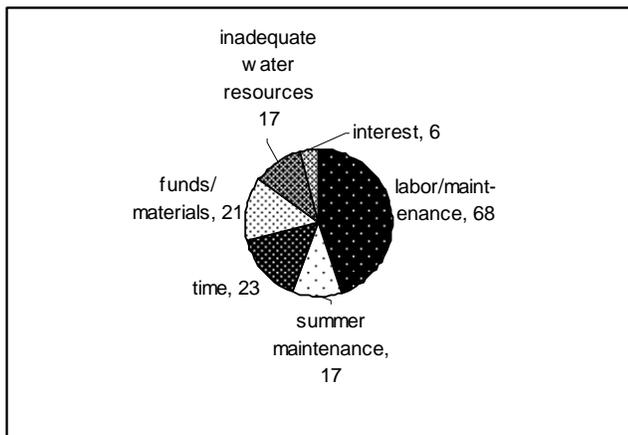


Grant sources specified were Wal-Mart, Petals, Clemson Landscapes for Learning, Green Team, EIC, Westinghouse, Lowe's, Champions of the Environment, Keep America Beautiful, Americorps, Hidden Valley, Seaworld/Busch Gardens/Fujifilm Environmental Excellence, Palmetto Pride, Toyota Tapestry, and Nickelodeon.

Assessment:

21 schools responded that they are currently evaluating the garden program (40%), while 26 responded that they are not (49%).

50 schools listed the greatest benefit of the garden program (94%). Mentioned most frequently was student involvement and enthusiasm, with 40 schools (75%) commenting that the greatest benefit was student interest, involvement, and enthusiasm, making learning fun for the students, and/or offering students hands-on-learning opportunities. Beautification of school was mentioned by 6 schools (11%). Four schools (8%) mentioned student ownership/pride as one of the greatest benefits, while 2 schools (4%) appreciated that the garden addressed school standards and could be used in the curriculum. All 53 schools listed the greatest challenge of the garden program. There were similar comments from the schools regarding the greatest challenges to starting/maintaining a school garden program: schools listed maintenance, time, and water concerns. The greatest challenge for 36 schools was help, labor, and maintenance concerns (68%). Of these, 9 specifically mentioned lack of summer maintenance (17%). The greatest challenge for 12 schools was time-related (23%), while funding or lack of materials was also the greatest challenge for 12 schools (23%). Nine schools cited inadequate water resources (17%). One school said that the garden was a liability because it did not address many standards, while another school responded that teachers could not spend time maintaining a garden when teaching was the priority.



All 53 schools also responded to the last question in the survey, which asked how schools would use hypothetical grant funding to improve the garden. 37 schools (70%) would purchase additional materials for planting, cultivating or expanding the garden, such as plants, seed, fertilizer and tools. Eleven schools (21%) had an interest in additional features for the garden such as seating/benches, composting, greenhouse, and educational resources such as gardening books or learning tools such as rain gauges and magnifying glasses. Ten schools mentioned an interest in an irrigation/sprinkler system (19%).

Conclusion:

School gardens are significant in SC. The survey responses indicate that school gardens are valuable to many, and the fact that over half of the gardens are older than five years indicates that they are well-established. The involvement of teachers, students, and many others indicates their significance as well. Nearly half of the school gardens have more than five participating teachers. Nearly nine out of ten gardens offer opportunities for students to get involved, both in the outdoor physical activity of the gardening process and in the lessons taught; almost 9 out of 10 gardens are used in science lessons, potentially serving as valuable teaching tools to increase student interest and learning through the hands-on activity and real-life demonstrations that are possible with a garden. Time students spend in the garden is significant, also; students at nearly half of the schools spend more than two hours in the garden per week (however, this may not necessarily be true year-round).

School gardens are productive, as well, with over half with produce and several gardens with enough left over to give away. Also, 45% of the gardens are used for teaching nutrition lessons. These lessons have the potential to increase students' appreciation for fresh fruits and vegetables and possibly having a life-long impact on food choices. Thus school gardens may have the potential to make a positive impact on students' nutrition. Four schools (Palmetto Middle, Saluda Elem., Anderson Mill Elem., and Pauline-Glenn Springs Elem.) already use produce from the garden in the school cafeteria.

Most positively, three out of four schools commented that the greatest benefit to the school garden was student involvement and enthusiasm. It is difficult to determine from the survey responses alone the impact of the gardens, but it seems that successful schools are those most able to integrate lessons with the garden and make a positive impact on the students. Several comments from the surveys indicate that gardens achieve success in providing students with positive experiences. In the words of educators, some of the benefits of a garden are seeing “the excitement of the children when they dig up a potato or see the blooms of the vegetables grow into a tomato [or] squash,” seeing “that the children had a better understanding of what it takes to produce food,” and “providing students with a means to learn content outside the classroom.” One educator said of his students that “this project has encouraged teamwork, developed self-sufficiency and truly broadened their knowledge & appreciation of agriculture & food production. Many (most) have never planted a garden.” Other comments were similarly enthusiastic.

The fact that schools with a few, or even one, interested teachers can successfully implement a garden shows that effort can be small, yet may still increase the possibility of increasing students' interest in healthier food. A garden does not need to be elaborate to be successful; a few plants can make a difference. For example, a few peanut plants at one school, and a few seeds planted in cups that one teacher uses as plant therapy at another school, are valued by students.

However, even school gardens that are successful indicate the need for resources; nearly 7 out of 10 schools indicate a need for decreasing the time-consuming and labor-intensive maintenance of the garden. Even the most beneficial garden cannot be maintained at the expense of teaching. Whether there is a need for year-round maintenance assistance, or for summer only, maintenance concerns outnumber the slightly more than one in five schools that indicate a need for funding and materials.

The survey results show that there is a definite interest in school gardens in South Carolina, and the survey results provide examples of what school gardens can offer. A school garden can be a beneficial, rewarding addition to the curriculum. However, interest in gardens is only the beginning; developing this interest and carrying out a school garden project present numerous difficulties. A teacher or school with an interest in a garden may not have enough resources to support one. It seems that maintaining a garden is worth the effort, but there are ways in which this effort could be reduced.

References:

1. Cason, K. Children are "growing healthy" in South Carolina. *Journal of Nutrition Education*. 1999;31:235-236.
2. Graham, H, Lane Beall, D, Lussier M, McLaughlin, P, Zidenberg-Cherr, S. Use of school gardens in academic instruction. *Journal of Nutrition Education & Behavior*. 2005;37:147-151.
3. Graham, H, Zidenberg-Cherr, S. California teachers perceive school gardens as an effective nutritional tool to promote healthful eating habits. *Journal of the American Dietetic Association*. 2005;105:1797-1800.
4. Morris, J, Zidenberg-Cherr, S. Garden-enhanced nutrition curriculum improves fourth-grade school children's knowledge of nutrition and preferences for some vegetables. *Journal of the American Dietetic Association*. 2002;102:91-93
5. McAleese, J, Rankin, L. Garden-based nutrition education affects fruit and vegetable consumption in sixth-grade adolescents. *Journal of the American Dietetic Association*. 2007;107:662-665.