

# Development and characteristics of worldwide school gardens during the 1890-1920

—the pioneer period of the School Garden Movement



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Photo: A mythological play being performed in a school garden in St Enda's school in Ireland. Resource from courtesy Pearse Museum

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# Development and characteristics of worldwide school gardens during the 1890-1920 —the pioneer period of the School Garden Movement

## Abstract:

The school garden is an indispensable part of modern education, which lets children physically learn natural science in school. Besides, in the last ten years, many kinds of research also show that school gardens are beneficial for children both physically and mentally. This paper focuses on analyzing the history of the school garden and compares the literature about the School Garden Movement in different countries, and further extracts the characteristics of school gardens in different countries from 1890 till 1920. In this way, we can also understand the advantages and disadvantages of school gardens in various countries from 1890 to 1920. Reflect on the development of the current school garden through the way of understanding history, and consider whether there is room for improvement of the current school garden.

**Key words:** historic school gardens, school garden movement, scientific education, landscape

## Introduction

School ground greening is a term widely used for establishing gardens and mixed plantings within schools (Dyment & Bell, 2007, p. 469). Garden advocates regarded school gardens as a way to maintain the spiritual well-being of the child and could even contribute to city beautification, the reduction of juvenile delinquency, improved public health and nutrition (Trelstad, 1997, p. 164). School gardens were gradually seen as an irreplaceable step in education, especially in younger students.

In today's educational system, the school garden has become an indispensable part. But in history, the development of the school garden was full of twists and turns. The school garden has experienced the initial capital accumulation of the First Industrial Revolution, has experienced fanatical growth during the First World War, and has also experienced the depression after the end of the war. The development of school gardens in the last century has inspired the development of school gardens today. How to manage and construct the school garden and make it develop in a sustainable and healthy direction?

The main question of this paper is what are common and different characteristics of worldwide school garden development during the period of the School Garden Movement<sup>1</sup> from 1890 to 1920. For example, during this period, in terms of the United States, the army will be linked with the school garden (Wake, 2016, p. 1). For Australia, it may be connected with colonization (WHITEHEAD, 2018, p. 351). It may be difficult to imagine these connections, but it is a phenomenon that has existed in history. What kind of social background led to the development of different school gardens in different countries in the same historical period?

At the same time, the School Garden Movement is a special and essential period for school garden development. People from different countries all paid attention to the students' education and social development through the school garden. This article will start by studying and explaining the School Garden Movement. Then collect information about school gardens in various countries during this period.

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1. School Garden Movement is a national movement in America during 1890 to 1920. In this period, the school garden has been greatly developed. The School Garden Movement will be discussed in detail below.

Through the analysis of pictures and documents, the characteristics of their respective developments are summarized. Analyze and compare the development characteristics of different countries, find out the similarities and differences, and analyze the underlying reasons.

Studying the history of the school garden is not only studying its past stories but also understanding the underlying reasons that promote the development of the story. History is just a medium, which helps us look at the development of school gardens more objectively. Knowing the reasons behind it, we can better apply the theory to the development of today's school gardens.

## Literature review

In recent years, educators have begun to pay attention to school gardens and analyze the benefits it brings to children. In the United States, in the past two decades (2000-2020), due to the resurgence of school gardens, thousands of schools have replaced plastic playgrounds with school gardens (Williams & Dixon, 2013, p. 216). More and more scholars have come to study the benefits of school gardens. Scholars have studied multiple rationales for the value of school gardens. First of all, the extension of classroom teaching is one of the most important uses of school gardens. It helps supplement scientific knowledge that can only be obtained through personal experiences, such as planting knowledge and biological knowledge (Rye et al., 2012, p. 64).

Besides, cultivating plants in the school garden can also cultivate children's sense of responsibility, so that children can acquire qualities that they can better face society in the process (Ratcliffe et al., 2009, p. 39). Not only that, but many students can also grow healthier through planting. They are more passionate about healthy food (Ozer, 2006, p. 855). Based on these studies and the admiration of nature in recent years, the school garden has begun to revive.

In addition to the research on the benefits of school gardens, some scholars also set their sights on the history of school gardens. The school garden began in the European continent in the 19th century, and it spread all over the world through immigration (Kohlstedt, 2008, p. 65). Scholars focused on the reasons for the emergence, development, and decline of school gardens, and studied the impact of social events in the history of school garden development. In the United States, the history of school gardens is closely related to the Nature-study movement<sup>2</sup> and the United States School Garden Army<sup>3</sup> that appeared during World War I (Wake, 2016). On the European continent, school gardens are more affected by government policies. (Forrest & Ingram, 2003, p. 80)

At present, scholars' research mainly focuses on two separate directions: the benefits of school gardens and the history of school gardens. In this way, there is sufficient literature about school gardens both in history and nowadays educational benefits. Therefore, this article attempts to start by analyzing and comparing the differences in various countries during the school garden movement, and then extracting conclusions that can be used for reference for contemporary school garden development from historical analysis.

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2. The Nature-study movement was a popular education movement that originated in the United States and spread throughout the English-speaking world in the late 19th and early 20th centuries. Nature-study changed the way science was taught in schools by emphasizing learning from tangible objects.

3. United States School Garden Army (USSGA), was founded by the Bureau of Education in 1917 during the administration of President Wilson's. USSGA will be discussed in detail below.

## Chapter 1: Brief history of school garden

### 1.1 The emerge and development of school garden

In a broad sense, a school garden refers to a place in the school for students to learn about planting and science. It usually consists of green land, arable land, greenhouses, and tool houses. The school garden has a history of nearly two hundred years of development and has long become an indispensable part of the school's education stage.

The Nature-study movement that occurred in the US is the main driving force for the emergence of school gardens (Trelstad, 1997, p. 164). Although school gardens have emerged in some European countries as early as the early 17th century, it was not until the Nature-study movement began to be widely promoted globally. In the 1890s, the Nature-study movement was initiated in the United States by Liberty Hyde Bailey<sup>4</sup>(Wake, 2016, p. 1). Under the influence of this movement, progressive educators of American proposed to make the school garden a place where classroom teaching can be integrated with the natural environment.

From 1890 to 1900 alone, thousands of school gardens were built in the United States, which left a deep impression on the education community (Kohlstedt, 2008, p. 72). By 1905, the school garden had changed from a rare teaching experiment to a scene seen everywhere in the city of American. Educators gradually realized the neglected role of school gardens in education, environment, and physical and mental development in the past. (Trelstad, 1997, p. 164)

With the beginning of the First World War, the development of the school garden entered a golden age. After that, in addition to educators, the government also began to intervene. During this period, many policies were promulgated to facilitate the development of the school garden all over the world, and the investment of funds was increased. The United States even established American United States School Garden Army to promote school gardens from a social perspective (Trelstad, 1997, p. 164). The school garden has been developed vigorously and has high hopes.

### 1.2 Tangible and intangible benefits of school garden

During the development of the school garden, educators also tried to quantify its unique advantages in the teaching system. Promoting natural research is not only the main driving force for the development of school gardens but also one of its irreplaceable advantages. After the school garden was introduced to public schools, students had the opportunity to learn about nature and science through extracurricular activities. Compared with textbooks, this is undoubtedly a teaching method that can attract children's interest.

In addition, more and more educators are aware of the obesity problem of children, and school gardens may become one of the solutions (Ozer, 2006, p. 855). Students learn farming in the school garden under the organized leadership of teachers. This kind of teaching is often cyclical and highly involved. This kind of regular labor can reduce the obesity rate in primary and secondary schools to some extent.

Mental health is also one of the benefits that school gardens can bring. The inevitable collaboration in the farming process allows children to learn to respect others (Blair, 2009, p. 20). The process of planting also cultivated the sense of responsibility of the students.

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4. Liberty Hyde Bailey, American horticulturist and botanist, co-founder of the American Horticultural Science Society. Bailey is believed to have played a role in the development of the Nature-study movement in the United States.

### 1.3 Link school garden with social meaning

With the rapid development of the school garden in the early 20th century, the government and capital of some countries began to enter this field. For example, in America, the intervention of funds and policies not only brought unprecedented development opportunities to the school garden but also gradually deviated from its original purpose. Between the teaching purpose of strengthening natural research and social control, power is more biased towards the latter (Wake, 2016, p. 1). Among these people, the school garden is a convenient way to achieve a variety of social goals.

The school garden is expected to solve more problems. For example, people believe that a large area of school gardens can help increase the greening rate of cities to improve public health or reduce the rate of juvenile crime through planting and teaching, and even the expanding area of school gardens can create employment opportunities for new immigrants at the time and promote their Americanization in the US (Trelstad, 1997, p. 164).

With the passage of time, the school garden no longer looks like a learning place used by educators to supplement classroom knowledge, but looks more like a "Good Citizen Factory". The U.S. government called on more children to join the school garden through the establishment of a school garden army (figure 1). The purpose is not only to provide science education but to provide food for the First World War and to have a reserve army that can be replaced at any time (Trelstad, 1997, p. 164). Even in the eyes of neo-Marxists at the time, the school garden has become a tool for children to prepare for work and life in the capitalist labor system when they are students. At that time, the school garden had become a tool involving multiple interests (Cosin et al., 1979, p. 256).



Figure 1. Cultivating the Beets and Cabbages at the Albert S. Brandeis School Garden, Louisville, KY during school garden army period. Resource from "United States School Garden Army," 1919, p. 111.

### 1.4 Decline of school garden

Just like the development of the school garden, the decline of the school garden is also related to war. For example, with the end of the First World War, the government of America gradually reduced its investment in the construction of school gardens. The American government's limited funds were used in more important areas after the war, which gave people the feeling that the school garden is no longer important (Trelstad, 1997, p. 164). The illusion of prosperity and development brought out by countless funds

has accelerated the decline of the school garden. Similarly in Sweden, it seems that no one cares about school gardens after Second World War (Akerblom, 2004, p. 229).

In addition, the rapid development also makes people ignore the systemic nature of the school garden management to some extent. At that time, the construction of school gardens was not combined with related professional knowledge, such as landscape knowledge, which led to a chaotic development. Without systematic management, the construction of school gardens is usually linked to individuals. Once the person responsible for the construction leaves, the garden will fall into chaos and collapse (Wake, 2016, p. 5).

Another very important reason is the emergence of home gardens. The home garden not only has the benefits of a school garden, such as maintaining physical and mental health, but also allows the garden to be better controlled.

## 1.5 Revival of the school garden

In fact, during the Second World War, the development of the school garden resumed a certain movement. The war brought about the second Victory Garden project<sup>5</sup> in America and thus promoted the development of the school garden. However, the school garden during this period has lost the attention and support of the state, and with the start of forced bussing programs to desegregate schools, the popularity stopped in the 1970s (Bundschu-Mooney, Elizabeth, 2003).

Since the 1980s, with the support of the California Office of the Director of Public Education, the number of school gardens has ushered in a new surge. In the 1990s, many schools in the United States developed and implemented garden plans, and this enthusiasm continues to this day (Yu, Felicia, 2012).

The contemporary school garden movement is no longer just a topic discussed within the scope of education and science but has a sociohistorical context in which food has gained new cultural and political significance (Cairns, 2016, p. 310). Nowadays, the school garden has become a complex topic focusing on education, landscape, natural science, politics, and society.

## Chapter 2: School garden movement from 1890 to 1920

### 2.1 The emergence of the school garden movement

The school garden movement started in the United States. At the beginning of the 20th century, the supporters of the Nature-study movement and the reformers of urban progress formed an association. Under the influence of this group of people, the Nature-study movement which was popular throughout the United States was gradually turned into the American school garden movement. From 1914 to 1920, a large number of funds from the Education Bureau flowed into this field, which brought a huge increase in the number of school gardens (Wake, 2016, p. 5). Beginning in 1891, the first school garden was built in the United States. Until the end of 1918, the school garden construction trend ended with the end of the First World War (Trelstad, 1997, p. 164). This is a national movement that lasted for nearly 30 years, and it evolved into an international movement worldwide in the end.

### 2.2 Nature-Study Movement

The Nature-study movement originated in the United States. In the second half of the 19th century, environmental problems caused by the first industrial revolution

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5. Victory gardens, were vegetable, fruit, and herb gardens planted at private residences and public parks in the United States, United Kingdom, Canada, Australia and Germany during World War I and World War II. In wartime, governments encouraged people to plant victory gardens not only to supplement their rations but also to boost morale.

became increasingly prominent. More and more people were beginning to pay attention to the field of environmental protection at that time. Progressive educators and naturalists had also incorporated this topic into education. "study nature, not books" is their slogan (Kohlstedt, 2008, p. 89). As one of these pioneers, Liberty Hyde Bailey believes that the Nature-study movement in education can educate the child in terms of his environment, to the end that his life may be fuller and richer.

The Nature-study movement—a movement that hopes to make learning more interactive by introducing nature into teaching—has naturally become the primary driving force for the development of the school garden movement (Trelstad, 1997, p. 164). In other words, the school garden is actually a site where the Nature-study movement is implemented in schools and education. The original purpose of the Nature-study movement was to maintain rural life and to instill a love for the earth in young people. They try to teach children to admire nature and science and believe that this process should come from nature itself and not from books. The school garden came into being at this time, and the combination of education and nature allowed this movement to achieve its goals.

In addition, the Nature-study movement is the only profession that fully embraced the school garden (Trelstad, 1997, p. 164). Although the earliest forms of garden-based learning were influenced by both Maria Montessori<sup>6</sup> and the Nature-study Movement(wild), there is no doubt that the former one pays more attention to the education field.

At that time, the school garden was still an obscure term for the general public. Although a large number of school gardens were built during the school garden movement, this did not make it a professional issue in any field. The school garden is well preserved in publications and school records, but there is little literature written about these (Kohlstedt, 2008, p. 89). And at the same time, during the construction of the school garden, the design profession is not the main concern of people. In fact, social values and meanings are what people associate with the school garden at that time.

### 2.3 The policy established for developments

The school garden movement is a movement that has spread to the world. During the transition period from the 19th century to the 20th century, many countries have promulgated decisions and activities related to this to support the construction of school gardens.

As early as 1865, Sweden had the first guidelines for school gardens called *Type Drawings for Elementary School Buildings (1865)*<sup>7</sup>. The guidelines clearly stated that in schools, gardens should be built around buildings and preferably located in the south (Akerblom, 2004, p. 229). Berlin public schools were also presented with study plants from a central garden plot in that same decade (Kohlstedt, 2008, p. 73). After this, school gardens were compulsory in Austria, Belgium, and France from 1869, 1873 1887, respectively (Forrest & Ingram, 2003, p. 80).

The school garden spread throughout Europe during the School Garden Movement period. By the 1880s, gardens in Austrian schools had become a must. At the same time, agricultural instruction was also obligatory at French schools (Yu, Felicia, 2012).

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6. Maria Tecla Artemisia Montessori was an Italian physician and educator. Her educational method is in use today in many public and private schools globally.

7. *Type Drawings for Elementary School Buildings (1865)* is the first guideline for school gardens formulated by the Swedish government, which details some regulations about schools.



In 1893, the Committee of Ten of the Association endorsed it as the appropriate preparation school science in America (Kohlstedt, 2008, p. 88). From 1902 in Britain, school gardens in elementary schools were under the of the county councils (Forrest & Ingram, 2003, p. 80). After that, the International Children's School Farm League, founded in 1907 by Fannie Parsons of New York, sought to "urge the introduction of Children's Gardens into schools and park systems." (Trelstad, 1997, p. 166)

1918, the US government established the United States School Garden Army to meet domestic vegetable production demands. in 1918 the "Victory Gardens" received a \$50,000 grant from the National Security and Defense appropriation (Trelstad, 1997, p. 166).

## **Chapter 3: Different countries, different situation**

### **3.1 School garden in United States**

#### **3.1.1 Emerge from European educational theory**

The rise of American school gardens originated from the 19th-century obsession with European educational theory (Kohlstedt, 2008, p. 70). The educators who first immigrated to the United States noticed this advanced teaching theory at the time—the integration of the classroom and the natural environment. By the end of the 19th century, educators and textbook authors in North America began to discuss the teaching potential of school gardens. In addition, the Nature-study movement, which was very popular at the time, was also one of the driving forces of this momentum.

Although the initial development of school gardens was influenced by European precedents, under the influence of indigenous people, the United States started the school garden movement that will spread throughout the world. During that period, the school garden movement tried to integrate teaching, practice, and aesthetics. People even imagined the perfect layout of the school garden. By 1905, the school garden had become a common sight in the city (Trelstad, 1997, p. 166).

#### **3.1.2 USSGA**

From the end of the nineteenth century to before World War I, the development model of school gardens in the United States was similar to that of other countries in the world at that time. It wasn't until the Federal Bureau of Education launched the United States School Garden Army-USSGA, which was aimed at urban and parish youth during the First World War (Hayden-Smith, 2007, p. 22).

USSGA began in the spring of 1917, shortly after the United States declared war on it (Hayden-Smith, 2007, p. 22). USSGA is regarded as a post-war reinforcement, providing food and strong youth for the war. As described in *A Manual of School-Supervised Gardening for the Western States*, "Every boy and every girl... Should be a producer..." Production is the first principle in education (Stebbins & United States. School Garden Army, 1920, pp. 1–3). The growing of plants and animals should therefore become an integral part of the school program. Such is the aim of the US School Garden Army." Not only that, but the nationwide propaganda also helped the United States improve its concept and morale at that time. Many posters related to USSGA were created at that time (figure 2).

The USSGA plan is very effective. By the end of the First World War, a total of millions of American youths had been called up as "soldiers of soil", more than 50,000 teachers had accepted USSGA courses, and thousands of community volunteers had participated (Hayden-Smith, 2007, p. 26). A large amount of food was produced, and it was transported to nearby cities and even to support battlefields as far away as Europe. At the same time, this plan also made people interested in rural life and alleviated the problem of the influx of rural people into cities at that time.

However, the excessive association with the war also led to a change in the nature

of the school garden. When the war is over, people enter a period of burnout and lose their enthusiasm for everything about war. Although the original direction of the school garden is in the field of education, it still cannot escape the fate of being abandoned by the world (Wake, 2016, p. 5).

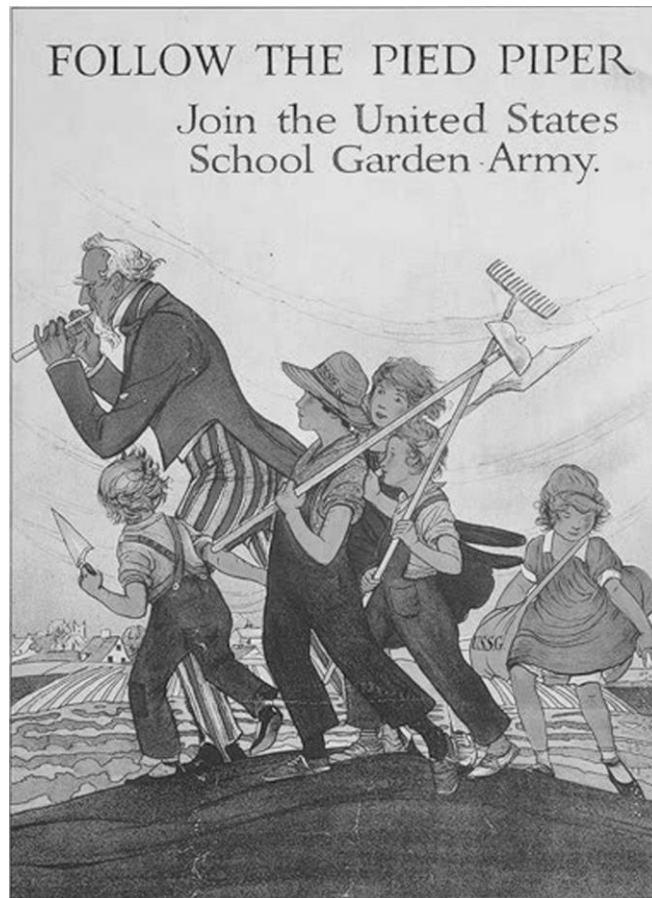


Figure 2. This is a poster, created in 1919, showing that Uncle Sam uses the flute to call children to participate in the American School Garden Army. Resource from Library of Congress. <http://hdl.loc.gov/loc.pnp/cph.3g03691>

### 3.1.4 Conclusion

The development of school gardens in the United States is different from other countries. First of all, there is a lack of systematic development of school gardens in the

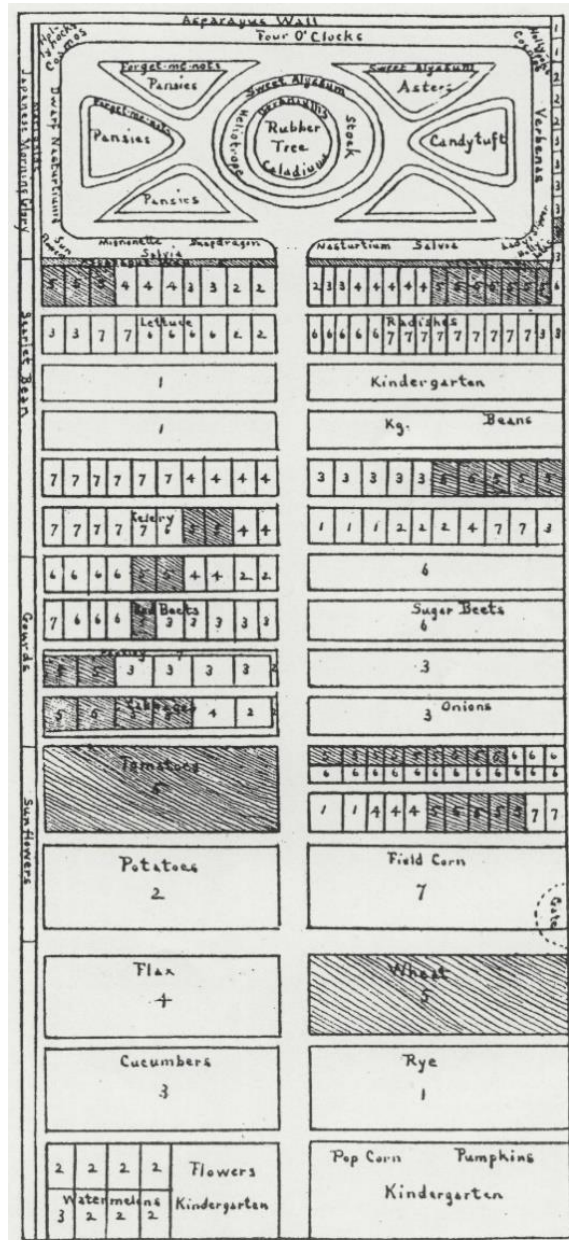


Figure 3. Garden of Francis W. Parker School. At that time, under the influence of USSGA, the school gardens were planted with more vegetables than flowers, and the layout was rigorous. Resource from Biodiversity Heritage Library. <https://doi.org/10.5962/bhl.title.30186>

United States. From the establishment of the first school garden to 1917, the government has never intervened in the field of school gardens. At that time, the construction of school gardens was more of personal behavior, and professionals in related fields usually did not actively participate in school management and planning the construction of school gardens. The school's teachers became the only candidates for the construction and maintenance of the school's garden. The reliance of the movement on teachers skilled in gardening and the lack of substantive professional support to integrate gardens meaningfully into curriculum learning (Trelstad, 1997, p. 166). Because there is no systematic management, often after staff with relevant professional knowledge leaves, the school garden maintained by him also collapsed. This situation has not improved much after the establishment of the School Garden Army by the Federal Education Bureau. USSGA pays more attention to the output of school gardens but does not invest too much in designing them. The landscape and innovation of gardens are usually not considered important (Trelstad, 1997, p. 166).

Second, the development of American school gardens is always associated with social significance. When the school garden was brought into the public eye by the government, the educational significance was gradually abandoned. Instead, school gardens are used as a means to improve society. Beautify cities, reduce juvenile delinquency, Americanize immigration, and so on. Between the educational goals of natural studies and social control,

power always favors the latter. This hopeful meaning entrusted by society has also had an impact on the composition of school gardens in the United States. For example, during the establishment of the United States School Garden Army the layout of American school gardens was often rigorous, and most of them planted vegetables (figure 3 and 4).

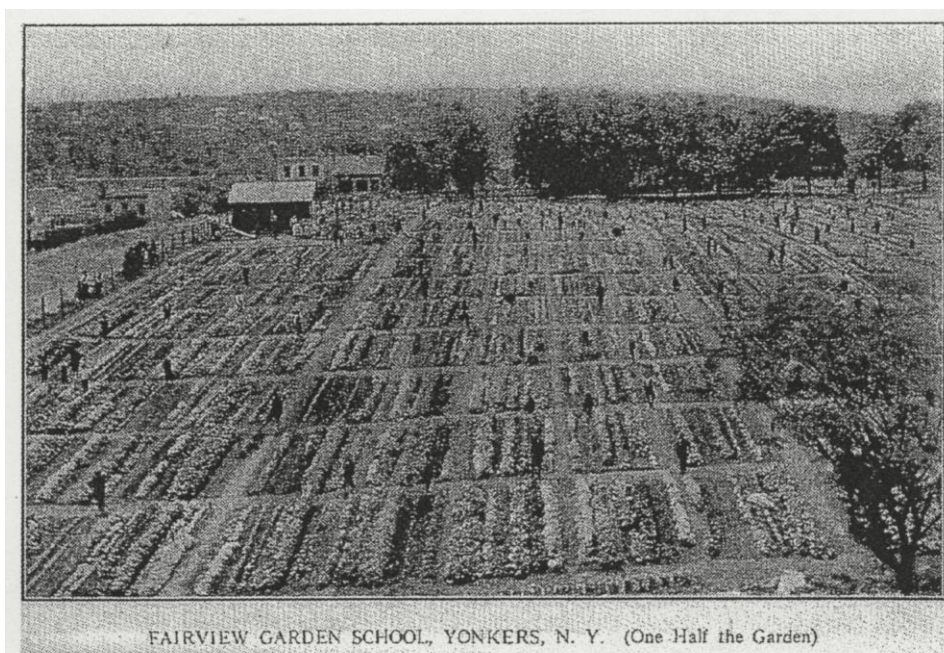


Figure 4. Fairview Garden School, Yonkers, New York. The rigorous garden layout looks more like farmland than a school. Resource from Biodiversity Heritage Library. <https://doi.org/10.5962/bhl.title.30186>

## 3.2 School garden in Europe countries

### 3.2.1 Systematic development in Ireland

The development of horticultural education in Ireland can be traced back to the mid-1700s, but there is very little technical literature. Until the end of the 19th century, the reports of the Board of National Education in Ireland (Belmore Report, 1898) and of the Departmental Committee of Inquiry (Digby Report, 1907), which was established to inquire whether the provisions of the Agriculture and Technical Instruction (Ireland) Act 1899 had been followed (Forrest & Ingram, 2003, p. 80).

On April 1, 1900, the Irish Department of Agriculture and Technical Guidance (DATI) was established to assist and develop agriculture and fisheries. At the same time, the functions of the Education Committee were transferred to the Guidance Department, so they were also responsible for encouraging technical education in the new technical schools, including gardening education (Forrest & Ingram, 2003, p. 80).

At the beginning of the 20th century, Irish educators believed that the gardening system curriculum in schools was very important. It provided students with intellectual, physical and moral development opportunities. Beginning in 1901, July and August of each year have become the time for students' summer courses. Initially, this summer course only offered courses on science, art and family economics. By 1906, a technical school in Kingston opened a short course in gardening. After that, between 1909 and 1922, a summer course in rural science and school gardening was provided for national school teachers. Between 1909 and 1910, DATI only allowed horticultural instructors to help train teachers for this short course. But after only a year, these instructors were allowed to teach willingly in suitable centers.

In 1903, the DATI grant-aided schools in several locations, Cork, Midleton, Mitchelstown, Waterford, and Tipperary<sup>8</sup>, to establish gardens with vegetables, fruit, and flowers. In 1911, rural science and school gardening was introduced into the national school curriculum as an optional subject by DATI. By 1916, rural science became part of the national teacher training (Forrest & Ingram, 2003, p. 80).

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8. Cork, Midleton, Mitchelstown, Waterford, and Tipperary are the towns of Ireland

However, it is interesting that gender differences have become one of the characteristics of the development of Irish school gardens. From 1912 to 1924, the number of school gardens in Ireland continued to increase, and the government was also funding this activity. But the vast majority of government funding is provided to boys. School gardening also occurred in girls' elementary and secondary schools, although it was not grant-aided. In 1917, because of the outbreak of war, the government initiated a food production plant. During this year, female teachers and female students received part of DATI's funding for male teachers. However, this does not mean that they can engage in the main gardening activities like boys. Girls are more allocated to cleaning weeds and cleaning roads and other trivial tasks (Forrest & Ingram, 2003, p. 80).

To sum up, the development of school gardens in Ireland is strategic. At the beginning of the rise of school gardens in Ireland, the Irish Department of Agriculture and Technical Guidance (DATI) was established to manage and develop school gardens. DATI added school gardens to the curriculum and trained relevant personnel, all of which made the development of school gardens in Ireland more professional. However, gender differences are a negative feature of the development of Irish school gardens (figure 5).



Figure 5. The gardener Michael Mac Ruaidhri instructing pupils in the Cullenswood (school) garden. You can only see the boys. Resource from courtesy Pearse Museum.

### 3.2.2 School garden in Poland

As early as the end of the 19th century, Poland tried to build the first school garden. In 1898, people established a botanical garden in the man-made woods of the city. This is a place where plants are stored. At the same time, people will also teach nature lessons here (Dudek-Klimiuk, 2019, p. 24).

Different from other countries, during the interwar period, "The central school garden" is a more popular form. Compared with ordinary school gardens, the central school garden is more closely related to big cities. It is usually located in the middle of many schools so that schools of different levels can operate at the same time. In Poland, educators believe that it is important that natural science teaching includes short trips and field research. Forests, grasslands, and fields are children's land, so it's important to organize courses in open areas. It is unrealistic to require every school in a big city to have such conditions, but the central school garden helps to solve these problems.

(Pudelska & Rojek, 2016, p. 65)

The central school garden is defined as "a garden that shows students different and unusual plants". At the same time, the central school garden in Poland has the same exemplary features similar to the university garden. Therefore, the central school garden often has a higher standard, and they are usually big and designed by well-known designers (figure 6). Polish educators believe that in addition to the essential basic functions of school gardens, designers also need to consider their aesthetics. This is an indispensable part because it will directly affect children's aesthetic education and subtly root harmony and beauty in children's thoughts.

Another characteristic of the Polish school garden is the collective nature. The most intuitive manifestation of this is that the central school garden is shared by the adjacent collective school (Dudek-Klimiuk, 2019, p. 24). The municipality and the district school education office, together with the school, jointly undertake the maintenance of the central garden. In addition, the central school garden is often open to the outside world. While students are studying natural sciences in the school garden, adults are also allowed to participate after paying a certain fee.

The elements of the school garden are also strictly required in Poland. The school garden is managed separately from the school, and it is stipulated to have a practical area in addition to the demonstration area. In the demonstration area, the school garden is used to display plant systems, biology, and pharmacy, etc. In the practical area, students will conduct some experiments. There is also a garden especially for children with tuberculosis. In this garden, in addition to the demonstration area and the practice area, there must be ample sports area and children's play area. At that time, school gardens also paid more attention to ecological balance, and people tried to create school gardens based on natural communities. In terms of design, the school gardens built during the two world wars basically adopted modernist design principles.

Generally speaking, the central school garden in Poland usually serves the entire city, and it is not limited to educational functions. Secondly, the aesthetics of the school garden has been placed in a very important position. The school gardens designed at that time were usually designed according to the fashion and design trends of the same period.



Figure 6. Urban Inter-school Natural Garden of interschool Botanical Garden in Łowicz in Bratkowice. A part of the central garden, 1938. At that time, central school garden is popular in Poland. Resource from State Archives in Warsaw.

### 3.3 School garden in other countries

#### 3.3.1 School garden in Sweden

As early as the first half of the 19th century, Sweden began to explore the school garden. In 1840, the Swedish Parliament proposed to combine the garden with the teacher's residence to facilitate the teaching of gardening there. In 1860, the Swedish educator Eneroth advocated a teaching method that combines outdoor education with children's activities. The first guideline for school gardens, "Type Drawings for School Buildings" was published in 1865, which stipulated the details of elementary school construction. After subsequent revisions of this edition of the guide, the school garden was given a more important position in Sweden (Akerblom, 2004, p. 229). In this revised guide, it is clearly mentioned: around the building, it is best to arrange the school garden in the south. However, despite this, the school garden was not included in the normal teaching curriculum until the 1880s. In 1887, Stiftelsen Lars Hiertas Minne<sup>9</sup> organized a competition for school garden design in Sweden. During this period, there were many layout proposals for elementary school which was full of design ideas (figure 7). Even in 1890, Sweden issued a guidance document specifying the types of drawings for school gardens. Various guidance documents issued from 1860 to 1890 led to a rapid increase in the number of school gardens in Sweden. Until the late 1890s, about 2000 elementary schools in Sweden had school gardens, accounting for 65% of the total number. (Akerblom, 2004, p. 229)

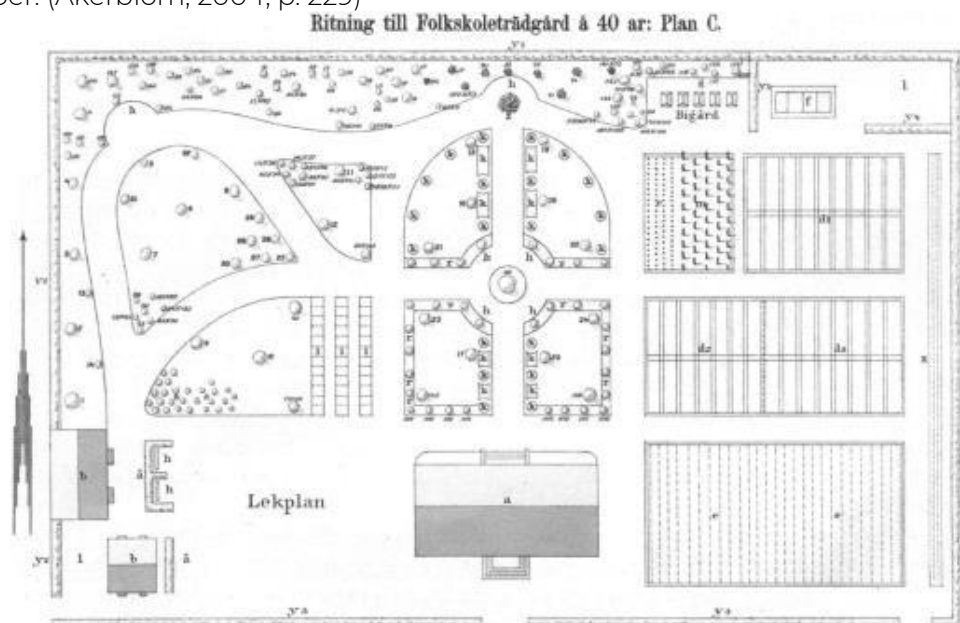


Figure 7. Proposal for a 1-acre elementary school garden in the competition guideline from 1890. It can be seen that at that time, the Swedish school garden plan was full of design. Resource from <https://www.jstor.org/stable/4150383>

With the urbanization process in Sweden at the end of the 19th century, people began to realize the importance of nature. Therefore, after entering the new century, school gardens are increasingly regarded as important natural elements in cities. The school garden is regarded as an important way for students to get in touch with nature. After the Swedish government formally took over the management of primary schools in 1919, school gardening became a must-have theme in schools (Akerblom, 2004, p. 229).

9. Lars Hierta (1801 - 1872) was an industrialist, publicist, publisher, and member of parliament. He founded a foundation in 1877 which receives applications from individual researchers for projects in all subject areas.

The development of school gardens in Sweden is closely related to the demand for food. Around 1900, food supply was an important reason for the development of school gardens in Sweden. Therefore, during the Second World War, after the total domestic food production in Sweden exceeded the national demand for the first time, the development of school gardens fell to a halt until they disappeared.

Having clear guidelines is one of the characteristics of the development of Swedish school gardens. Although during the school garden movement, countless well-known designers were invited to participate in the design of the school garden, their designs were based on the design guidelines issued at the time. Therefore, we can also see from the layout of several school gardens at that time that some similarities can be seen in these layouts. For example, the layout is based on the path as the mainline, the gardens are located as far as possible to the south of the school, and the layout is mostly neat and so on. Another feature is that Swedish school gardens were carefully designed by designers during the school garden movement period. The layout of the Swedish school garden seems to be richer than that of other countries in the world at that time (figure 8).

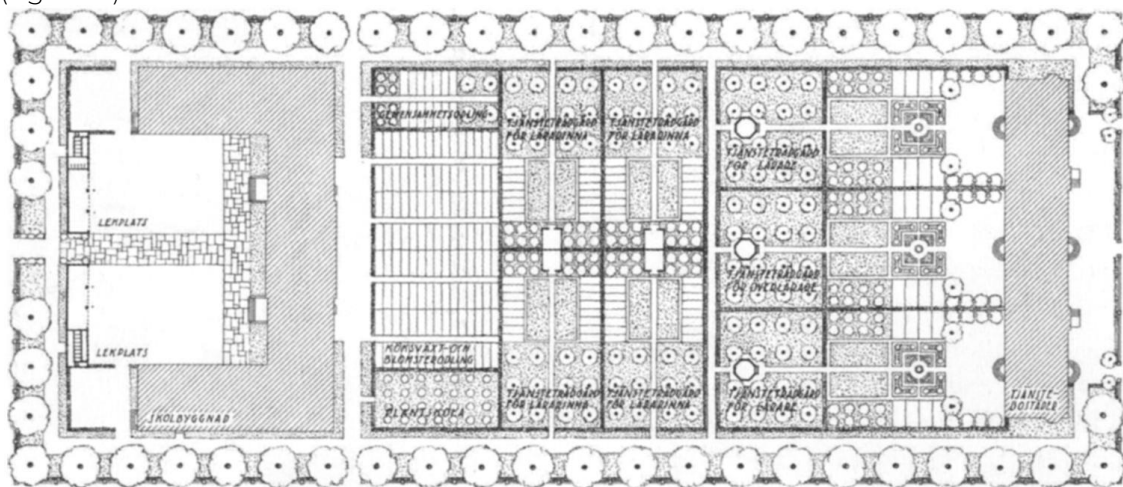


Figure 8. Architects Hoog & Mosing designed a school plan for a primary school in central Sweden. This can reflect that the school gardens in Sweden were carefully designed at that time. Resource from <https://www.jstor.org/stable/4150383>

### 3.3.2 School garden Australia

The development of school gardens in Australia is deeply influenced by the United Kingdom. After Britain announced the colonization of Australia in 1836, white settlers began to use Australian land in large quantities. After that, people began to develop education (Robin, 2001, p. 88). In 1879, the principals of a group of urban schools in Australia organized the Public Schools Floral and Industrial Society. In 1889, the British Ministry of Education in Australia introduced Arbor Day to instill children's sense of value in trees. In 1907, when Australia was a British colony, the League of Empire convened a federal education conference. At the meeting, the British government stipulated that an imperial education meeting be held every four years, and all British affiliates were required to participate. Therefore, it is not surprising that Australia and the United Kingdom have similar school garden developments. However, Australia's focus is different. In Australia, school gardening is considered practice and more involved in "technical" education. At the same time, due to the vast territory of Australia, the school has a large area and therefore the design of the school garden is freer. (Robin, 2001, p. 88) (figure 9)

Another distinctive feature of the development of Australian school gardens is the intensification of social divisions. Although in the "Education Act" promulgated in 1875, Australian Aboriginal children were not specifically excluded from the education



system, but most state school systems would deny them admission. Gardening in the school was also used as a tool to deepen the sense of belonging to the land of the white settlers and children. This actually deepens racial differences. At the same time, gender differences are constantly forming. Boys are encouraged to participate in school gardening activities, while girls are only allowed to participate in gardening activities for one and a half hours every three weeks. Ultimately, school gardening reinforced colonial South Australia as a class-, race- and gender-differentiated society. (WHITEHEAD, 2018a, p. 346)



Figure 9. School children in the garden in Australia. Resource from La Trobe Australian Manuscripts Collection, State Library of Victoria.

## Chapter 4: Conclusion and future directions

### 4.1 Characteristics of school garden movement from 1890 to 1920

The period from 1890 to 1920 can be said to be the golden period for the development of the school garden. During this period, many countries in the world are vigorously developing school gardens. These countries are located in different places in the world and have different cultural backgrounds. But because of the same period, the development of their school gardens was affected by similar thought trends and the same historical events. Therefore, the development of school gardens in these countries also had similarities during this period.

First of all, if you trace the history of school gardens in various countries, you will find that the first industrial revolution was the driving force behind the development of school gardens in most countries. The first industrial revolution arose in the middle

of the 18th century and lasted from the 1830s to the 1840s. During this period, capitalist countries accumulated the original capital for development, but at the same time, the natural environment was severely damaged. Therefore, in the mid to late 19th century, more and more environmentalists appeared. They advocated restoring nature, increasing people's chances of contact with nature, and improving people's living environment. Educators among environmentalists tried to integrate nature into the classroom, and the prototype of the school garden was formed. For example, the natural research movement originated in the United States. It can be said that the countries that experienced the first industrial revolution in the 19th century not only accumulated capital for the development of school gardens, but also paved the way for their development. The emergence of the school garden is natural.

Secondly, at the beginning of the 20th century, the development of school gardens in many countries was affected by the First World War. This intuitively manifested as linking school gardens with food production. The school gardens established during this period were all expected to increase food production. In the United States, the government even established a school garden army. Millions of American youths in school became "soldiers of soil", providing necessary food reserves for war. Similarly, the development of school gardens stagnated after Sweden's domestic food production exceeded demand during World War II.

Another common point is that the school gardens developed during this period are not only for the education field. This is reflected in almost every country. In Australia, the school garden has to some extent become a tool for cultivating the children of white colonists to belong to the land. In the United States, the school garden is to provide the society with responsible workers who know how to garden-it has become a tool for stabilizing the society, and at the same time trying to solve the problem of rural population loss. During the school garden movement, Poland used the central garden to solve the problem of lack of urban green space. But the above does not mean that the development of school gardens mixed with other purposes has taken an incorrect path. On the contrary, in the era when educational awareness has not yet been fully popularized, these purposes outside the meaning of education have become the driving force for the development of school gardens.

At the same time, there are subtle differences in the development of school gardens in different countries during the school garden period. For example, although both the nature research movement and the school garden movement originated in the United States, the development of school gardens in the United States lacked professional knowledge. This is because, in the early stages of development in the United States, school gardens were not systematically managed. School gardens are often personal actions. Furthermore, in the late period of the school garden movement, after the government intervened in the school garden. People pay more attention to the social value and economic value brought by the school garden and ignore the educational value. In Australia, most of the time in school gardens, only male students are allowed to participate in activities, which leads to gender discrimination. And because of the large territory, Australia's school gardens are often designed more freely. For Poland, the school garden has been separated from educational meaning and turned into social meaning. The school garden is regarded as the common property of the city.

In general, no matter which country you are in, discussing the development of school gardens cannot be separated from the exploration of the social environment and the international situation at that time. Although the school garden is just a small green space in the corner of the campus, it can reflect the trend of the times. Whether it is the First Industrial Revolution or the First World War, although on the surface it is a social event that is not very close to the school garden, it is still affecting the trend of education and thus the school garden.

## 4.2 Future directions

By studying the history of the school garden movement, the context of the school garden development has been roughly understood. Although 1890 to 1920 was the first golden period for the development of the school garden on a global scale, there is no shortage of places for people to understand, study and learn in every country. This includes the good side and the bad side.

First of all, the construction of school gardens should be combined with professional knowledge, and at the same time include educational knowledge and landscape knowledge. When teachers on campus organize the construction of school gardens, it is very easy to only consider teaching issues and ignore the landscape layout of school gardens. And when landscape architects design school gardens, they may inevitably ignore some of the problems encountered in teaching. At the same time, systematic management is also essential. The early development of school gardens was often sloppy and unstructured, which led to uncontrolled development. Therefore, the school garden during this period often collapses because the people who built it leave. Countries like Sweden thought of guidelines for the establishment of school gardens at the end of the 19th century. You can also set up a special organization to supervise the school garden like in Ireland. If a systematic school garden management mechanism is successfully established, you can avoid the possibility that the garden levels of different schools in different regions are too different.

In addition, the school garden should not only focus on horticulture and science training, but should also be compatible with students' aesthetic education. Judging from the history of the development of school gardens, more teachers are willing to regard school gardens as practice venues, thus neglecting the aesthetic function of school gardens. In Sweden and Poland, as early as the last century, the school garden has brought modernist aesthetics into the school garden. Now that the problem of food and clothing has been solved in most countries, quality education and aesthetic education should be put on the agenda.

Last but not least, school gardens should not pursue social significance more than teaching significance. This is a problem that most countries will face during the school garden period. For example, at the time, the US government regarded school gardens as a way to achieve multiple social goals: beautify the city, reduce juvenile crime, and Americanize immigration. In Australia and the United Kingdom, the school garden was also regarded as a place where morally uplifting contemplation and worthy hard work could be combined.

## Reference

- Akerblom, P. (2004). Footprints of School Gardens in Sweden. *Garden History*, 32(2), 229. <https://doi.org/10.2307/4150383>
- Blair, D. (2009). The Child in the Garden: An Evaluative Review of the Benefits of School Gardening. *The Journal of Environmental Education*, 40(2), 15–38. <https://doi.org/10.3200/joee.40.2.15-38>
- Bundschu-Mooney, Elizabeth (Ed.). (2003, May). *School Garden Investigation: Environmental Awareness and Education*. <https://files.eric.ed.gov/fulltext/ED480981.pdf>
- Cairns, K. (2016). Connecting to food: cultivating children in the school garden. *Children's Geographies*, 15(3), 304–318. <https://doi.org/10.1080/14733285.2016.1221058>
- Cosin, B. R., Bowles, S., & Gintis, H. (1979). Schooling in Capitalist America. *The British Journal of Sociology*, 30(2), 256. <https://doi.org/10.2307/589546>
- Dyment, J. E., & Bell, A. C. (2007). Active by Design: Promoting Physical Activity through School Ground Greening. *Children's Geographies*, 5(4), 463–477.

<https://doi.org/10.1080/14733280701631965>

Dudek-Klimiuk, J. (2019). The former urban school gardens. *Czasopismo Techniczne*, 2, 19–28. <https://doi.org/10.4467/2353737xct.19.018.10154>

Forrest, M., & Ingram, V. (2003). School Gardens in Ireland, 1901–24. *Garden History*, 31(1), 80. <https://doi.org/10.2307/1587403>

Hayden-Smith, R. (2007). "Soldiers of the Soil": The Work of the United States School Garden Army during World War I. *Applied Environmental Education & Communication*, 6(1), 19–29. <https://doi.org/10.1080/15330150701319453>

Kohlstedt, S. G. (2008). "A Better Crop of Boys and Girls": The School Gardening Movement, 1890–1920. *History of Education Quarterly*, 48(1), 58–93. <https://doi.org/10.1111/j.1748-5959.2008.00126.x>

Ozer, E. J. (2006). The Effects of School Gardens on Students and Schools: Conceptualization and Considerations for Maximizing Healthy Development. *Health Education & Behavior*, 34(6), 846–863. <https://doi.org/10.1177/1090198106289002>

Pudelska, K., & Rojek, K. (2016). Functional and spatial transformations and contemporary role of educational garden on the example of school garden in Sobieszyn. *Teka Komisji Architektury, Urbanistyki i Studiów Krajobrazowych*, 11(2), 63–72. <https://doi.org/10.35784/teka.548>

Ratcliffe, M. M., Merrigan, K. A., Rogers, B. L., & Goldberg, J. P. (2009). The Effects of School Garden Experiences on Middle School-Aged Students' Knowledge, Attitudes, and Behaviors Associated With Vegetable Consumption. *Health Promotion Practice*, 12(1), 36–43. <https://doi.org/10.1177/1524839909349182>

Robin, L. (2001). School gardens and beyond: progressive conservation, moral imperatives and the local landscape. *Studies in the History of Gardens & Designed Landscapes*, 21(2), 87–92. <https://doi.org/10.1080/14601176.2001.10435237>

Rye, J. A., Selmer, S. J., Pennington, S., Vanhorn, L., Fox, S., & Kane, S. (2012). Elementary School Garden Programs Enhance Science Education for All Learners. *TEACHING Exceptional Children*, 44(6), 58–65. <https://doi.org/10.1177/004005991204400606>

Stebbins, C. A. & United States. School Garden Army. (1920). *A Manual of School-supervised Gardening for the Western States*. Department of the Interior, Bureau of Education, United States School Garden Army.

Trelstad, B. (1997). Little Machines in Their Gardens: A History of School Gardens in America, 1891 to 1920. *Landscape Journal*, 16(2), 161–173. <https://doi.org/10.3368/lj.16.2.161>

WHITEHEAD, K. (2018). James Greenlees' school garden and the suburban dream in colonial Australia. *Studies in the History of Gardens & Designed Landscapes*, 38(4), 342–352. <https://doi.org/10.1080/14601176.2018.1505138>

Wake, S. (2016, May 13). 'Same, same, but different': a comparison of rationales between historic and contemporary school garden development. Research Bank. <https://unitec.researchbank.ac.nz/handle/10652/3373>

Williams, D. R., & Dixon, P. S. (2013). Impact of Garden-Based Learning on Academic Outcomes in Schools. *Review of Educational Research*, 83(2), 211–235. <https://doi.org/10.3102/0034654313475824>

Yu, Felicia. (2012). *SCHOOL GARDEN SUSTAINABILITY: MAJOR CHALLENGES TO THE LONG-TERM MAINTENANCE AND SUCCESS OF SCHOOL GARDEN PROGRAMS*. University of Delaware. <http://udspace.udel.edu/handle/19716/12045>