

GARDENING AND CHILDREN'S GARDEN

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ABSTRACT

The last decade has witnessed a groundswell of enthusiasm for children's gardens and the educational programs that are closely integrated with them. Children can learn new skills, have fun, play and develop self-confidence by spending time in the garden tending plants. Most children enjoy being outdoors and love digging in the soil, getting dirty, creating things and watching plants grow. Nevertheless today's children lack experience with gardening complexity. The purpose of this article is to review benefits of the gardening for children not only in the school but also in the urban parks and landscape settings. In addition providing design principles of this place in order to gardening for landscape architecture is another purpose of this research. Children's gardens and gardening programmes have long been seen as beneficial for children physically, psychologically, educationally and socially. The garden and contents should be specifically designed and scaled for children.

Keywords: Gardening, Learning Program, Children Garden.

BAHÇECİLİK VE ÇOCUK BAHÇELERİ

ÖZET

Son on yıldır çocuk bahçeleri ve onlarla yakından bütünleşen eğitim programları için ilgi çeken konu olmuştur. Çocuklar bahçede bitki bakımı ile vakit geçirerek yeni beceriler öğrenir, eğlenir, oynar ve özgüvenlerini geliştirebilirler. Çocukların çoğu açık havada olmaktan hoşlanır ve toprak kazmayı, kirlenmeyi, bir şeyler oluşturmayı ve bitkiler büyürken izlemeyi sever. Buna rağmen bugünün çocukları bahçelerden ve bahçecilik işleri deneyiminden yoksundurlar. Bu araştırmanın amacı, çocuklar için sadece okulda değil aynı zamanda kentsel park ve peyzaj alanlarında bahçe ve bahçe işlerinin faydalarını araştırmaktır. Ayrıca araştırmanın başka bir amacı ise peyzaj mimarlığında bahçe işleri için yer seçimi ve tasarımı ilkelerini belirlemektir. Çocuk bahçeleri ve bahçe programlarının çocuklar için fiziksel, psikolojik, eğitimsel ve sosyal olarak uzun süreli fayda sağladığı görülmüştür. Bahçe ve içeriklerinin özellikle çocuklar için tasarlanmış ve ölçeklendirilmiş olması gereklidir.

Anahtar Kelimeler: Bahçecilik, Eğitim Programları, Çocuk Bahçeleri.

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1. INTRODUCTION

Today's children lack experience with natural ecosystem complexity and gardening. In all, 83% of the U.S. population lives in metropolitan areas. Thus, pasture or wilderness is no longer the normative standard for experience in nature. Television, video games, and organized sports have taken the place of unsupervised wandering and environmental exploration. Children can learn new skills, have fun, play and develop self-confidence by spending time in the garden tending plants and growing their own food. Most children enjoy being outdoors and love digging in the soil, getting dirty, creating things and watching plants grow (Moore, 1995).

The last decade has witnessed a groundswell of enthusiasm for children's gardens and the educational programs that are closely integrated with them. Concurrent with the growing interest in children's gardens has been increased research in this emerging horticultural discipline.¹⁵ Although many studies have focused on the positive impacts of gardening such as increased academic learning (Alexander et al., 1995; Canaris, 1995; Klemmer et al., 2005) environmental attitudes (Lohr & Pearson-Mims, 2005; Skelly & Zajicek, 1998; Waliczek & Zajicek, 1999), nutrition knowledge and attitudes (Canaris, 1995; Lineberger & Zajicek, 2000; Pothukuchi, 2004), interpersonal skills and interaction (Alexander et al., 1995; Canaris, 1995; Pothukuchi, 2004), moral development (Alexander et al., 1995), Downloaded by and physical activity, little is known about the ways perform and designed places for gardening (Lekies & Eames Sheavly, 2007).

The purpose of this article is to review benefits of the gardening for children not only in the school but also in the urban parks and landscape settings. In addition providing design principles of this place in order to gardening for landscape architecture is another purpose of this research.

1.1. Children and Nature

Nature is a value-loaded term that has a social and cultural construct (Evernden, 1992) as well as a biological and physical meaning. It can be wild (equating to natural) or cultivated (pertaining to the rural idyll of neat fields broken by hedges and tree groups). It can also be unsafe (physical dangers as well as stranger dangers due to isolation) and even barbaric (the 'dog-eat-dog' world of nature). Yet most researchers are agreed that it is important if not essential for children to experience; having effects on a social, cognitive and emotional level. Faber Taylor and Kuo (2006) however, maintain that in the absence of more controlled experimental studies this is an assumption rather than a proven fact. Kahn and Kellert (2002, p. xviii) are less cautious and in the introduction to *Children and Nature* conclude 'there exists a critical and irreplaceable role of nature for all children'. Even in a world dominated by human activity and artificiality Kellert (2002) maintains 'nature continues to provide young people with an unrivalled source of attraction, stimulation, and challenge relevant in both intellectual and emotional development'. Furthermore, some researchers claim it cannot be effectively experienced vicariously via electronic games and video screens. Heerwagen and Orians (2002) suggest these feed on children's primordial fears to keep them 'playing for safety' while Pyle (2002) claims they entice children into a sedentary and blinkered existence. In both cases detachment from real nature and associated cultural experiences is felt to increase (Wake, 2008).

Children need environment-related experiences during the character decisive years of their life. Environmental experiences helps children prepare for their life and provide positive contributions to their development (Acar, 2013). Natural areas, one of the open spaces, and the materials they have can provide lots of opportunity for different activities when

they are used in accordance with the creativity and imagination of children. Some researchers state that experiences in natural areas play an important role on children's cognitive and affective development (Pyle, 2002; Derr, 2008). Actually these studies show that this situation is a reflection of adults' childhood experience (Derr, 2008). That is, adult's childhood experiences affect attitudes of their adulthood. Therefore, being in interaction with nature and natural materials in childhood contribute to getting information about this subject in future, being sensitive and conscious towards the environment and handing down this experience to the next generations. Childhood is a period for exploring and it is wonderful, powerful and life-changing discoveries for many children. In this process, period of 6-12 years is considered as middle childhood (Tai et al., 2006). Especially during middle childhood, children get significant experiences and skills that they can use throughout their lives. Therefore, interaction with nature is extremely important for people during this period (Bixler et al., 2002; Tai et al., 2006).

The accelerating process of urbanisation is seen to be a major cause of impact on children's quality of living (Chawla, 2002). The result is that children today are increasingly removed from both natural habitats, and cycles within non-human systems (Hart, 1994, Moore, 1995, Francis and Lorenzo 2002, Moore and Cooper-Marcus 2008). It seems to be an adult preoccupation to lament the loss of opportunities for children to experience nature while simultaneously setting obstacles in their way. For example Kong (2000) conducted a study of contact with nature in the lives of Singaporean schoolchildren. Some parents interviewed recalled their own positive childhood experiences of nature, while acquiescing to the difficulty of providing such opportunities today by

not encouraging their children to have regular encounters with natural outdoor environments. Francis and Lorenzo (2002) talk of the 'adultization of childhood', referring to the structuring of children's out of school lives with sports, music and other activities. Day and Midbjer (2007) claim many children are dependent on a succession of artificial 'boxes' (homes, cars, computers, televisions); what Aitken (2001) refers to as small spaces as containers for their activities. Security issues are cited by many adults as a realistic fear preventing them from being happy to let children go off to explore natural uninhabited places, and as rationales for structuring their lives and ferrying them around (Wake, 2008).

Previous studies show how children's nature experiences stimulate and affect children in several ways; in enabling creativity (Chawla, 1991), for well-being (Kaplan and Kaplan 1989), in reducing stress (Wells and Evans 2003; Faber Taylor and Kuo, 2009), in promoting health and motor development (Fjortoft ,2000; Faber Taylor and Kuo 2006; Martensson et al. 2014), in place attachment (Chawla, 1992) and in improved risk assessment (Smith 1998; Sandseter and Kennair, 2011). A positive correlation between access to nearby nature and levels of cognitive functioning is indicated by Wells (2000) and Faber Taylor et al. (2002) found an association between childhood experience of nature, adult patterns of use and attitudes to such places. A correlation between childhood nature experiences contact and pro-environmental attitudes as adults is also indicated by some researchers. A summary of this research illustrates that nature contact is generally positive for children's health, well-being and cognitive development (Table 1) (Skar, 2016).

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Table 1. The benefits of connecting to nature for children (Kals, 2003; Wells, 2000; Kuo and Taylor, 2004; Wells and Evans, 2003 Cobb, 1977; Crain 2001).

Supports multiple development domains	Nature is important to children's development in every major way—intellectually, emotionally, socially, spiritually and physically.
Supports creativity and problem solving	Studies of children in schoolyards found that children engage in more creative forms of play in the green areas. They also played more cooperatively. Play in nature is especially important for developing capacities for creativity, problem-solving, and intellectual development.
Enhances cognitive abilities	Proximity to, views of, and daily exposure to natural settings increases children's ability to focus and enhances cognitive abilities.
Improves academic performance	Studies in the US show that schools that use outdoor classrooms and other forms of nature-based experiential education support significant student gains in social studies, science, language arts, and math. Students in outdoor science programs improved their science testing scores by 27%.
Reduces Attention Deficit Disorder (ADD) symptoms	Contact with the natural world can significantly reduce symptoms of attention deficit disorder in children as young as five years old.
Increases physical activity	Children who experience school grounds with diverse natural settings are more physically active, more aware of nutrition, more civil to one another and more creative.
Improves nutrition	Children who grow their own food are more likely to eat fruits and vegetables and to show higher levels of knowledge about nutrition. They are also more likely to continue healthy eating habits throughout their lives
Improves eyesight	More time spent outdoors is related to reduced rates of nearsightedness, also known as myopia, in children and adolescents.
Improves social relations	Children will be smarter, better able to get along with others, healthier and happier when they have regular opportunities for free and unstructured play in the out-of-doors.
Improves self-discipline	Access to green spaces, and even a view of green settings, enhances peace, self-control and self-discipline within inner city youth, and particularly in girls.
Reduces stress	Green plants and vistas reduce stress among highly stressed children. Locations with greater number of plants, greener views, and access to natural play areas Show more significant results.

The physical tasks of food growing, such as digging and weeding, can contribute to a broader understanding of the various ways of staying active and teachers report that children and young people take greater responsibility for their own health. Obese children did gardening (cultivating, planting, maintenance and harvesting) for 30–45 minutes per day during a summer with the aim of increasing their physical activity (Kien 2003). The pre-school children's involvement in plant-stimulated discovery activities (Bunn 1686; Eberbach 1987) was considered. Williams and Mattson (Williams and Mattson, 1988) showed, during a 5-month study, that children participating

in a professionally supervised gardening programme increased their self-esteem and horticultural knowledge and that the garden looked better than that tended by unsupervised participants (Figure 1).



Figure 1. Children in the garden (Morris, 2010).

1.3. Developing Children's Interests and Skills in Gardening

Recommendations for sparking interest among young people in children's gardens have focused on creating inviting environments and programming that will interest children and youth from birth through teen. These elements have included specific plants and design features that encourage physical and sensory exploration as well as passionate staff, activities that are both educational and fun for children, and the absence of undesirable features such as long talking tours and concrete pathways (Lekies et al., 2006).

A few studies have addressed the ways in which gardening experience leads to future interest in gardening. College students majoring in horticulture have identified childhood experience with gardening as a strong influence in their decision to pursue this area of study (Lekies and Eames-Sheavly 2007). Lohr and Pearson-Mims (2005) associated growing up near natural elements such as flower beds, visiting parks, taking environmental classes, and gardening during childhood with more positive attitudes toward trees and a greater likelihood of participating in a class or program about gardening as an adult; the strongest influence came from active gardening activities. Alexander et al. (1995), Canaris (1995) documented children's enthusiasm for gardening, and a range of gardening skills learned, as a result of active, hands-on work with the planting and maintenance of school and community gardens. In addition to planting and tending to all aspects of the garden, the children also participated in other activities, including decision-making, recruiting other children, working as a team with other children and adults, engaging parents and visitors, fundraising, and outreach. Kleiber (1999) suggested that interest in an activity develops through a process of experimentation and exposure, having interest sparked, and then learning specific skills. Once skills are learned, competence is developed and there is greater commitment to, and long-term

pursuit of, the activity. An important and well-documented aspect of the process of exposure and experimentation is genuine participation, and having opportunities to fully engage in numerous decision-making and planning aspects of projects. Lucas (1995) advised "putting children at the heart of all aspects of the process of design," emphasizing that they should be involved with teachers, parents, landscape architects, artists, ecologists, child development specialists, and other interested groups in the "multi-professional activity" of developing landscapes (Lekies and Eames-Sheavly 2007).

Children have shown competence in making decisions about planting, community outreach, recording donations, mapping, testing soil, and building relationships with adult leaders (Canaris, 1995), as well as the actual designing and creating of gardens with a range of elements and themes. In addition, young people have the capability and willingness to make significant contributions to project efforts through planning and discussion, contributing ideas, problem-solving, organizing groups, and participating in research and evaluation (Figure 2) (Lekies and Eames-Sheavly 2007).



Figure 2. Children and Gardening (Morris, 2010).

1.4. Learning in the Garden

Personal experience and observation of nature are the building blocks for classroom enrichment (Nabhan & Trimble, 1994). A garden is an

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environment in miniature, and to be successful a gardener must work in sympathy with nature (Demas, 1979). Gardens ground children in growth and decay, predator-prey relations, pollination, carbon cycles, soil morphology, and microbial life: the simple and the complex simultaneously. Gardens are intensely local. Everything except possibly the purchased plants and seeds are part of the natural local environment. The clouds, rain, and sun, the seasonal cycle, the soil and its myriad organisms, the insects, arachnids, birds, reptiles, and mammals that visit the garden teach about place. Even if some of the weeds, insects, and birds are not native to a place, these immigrant flora and fauna are as locally adapted as the children themselves. Nature and natural are relative terms that depend on cultural norms and the limits of our own ahistorical experience with place (Finch, 2004; Mergen, 2003; Nabhan & Trimble, 1994). Seeds and gardening styles are the stuff of history, culture, ethnobotany, and literature. Along with English sparrows, starlings, quack grass, and bees, gardening provides another kind of lesson, one about human interaction with the natural World (Blair, 2009).

Contact with nature has also been seen to be associated with increased creativity and language development (O'Brien and Murray, 2005). Tabbush and O'Brien (2002) point out that education in the outdoors need not only be about learning about the environment. This is also demonstrated in Moore and Wong's (1997) action research which highlights the wide range of benefits afforded to children and teachers through the transformation of a tarmac school playground into a space filled with natural elements and subsequently named the "environmental yard" (Figure 3).



Figure 3. Gardening provides multiple learning opportunities for the children (Morris, 2010).

Incorporating gardening provides multiple learning opportunities for the children. Gardening can easily be connected to various subjects including math, science, English composition and nutrition, and allows children the opportunity to experience planting seeds, caring for plants, harvesting, and tasting the results of their efforts.

Gardening can also teach children:

- Respect for the Earth and its resources
- Responsibility
- Nurturing skills
- Pride in their accomplishments
- Knowledge of where their food comes from
- Healthy eating

Gardens give children a chance to try fresh fruits and vegetables and learn where food comes from. Kids who learn to love gardening at an early age grow into adults with a passion for plants and respect for the environment, Gardens allow children:

- To be active and engaged in learning
- To build on prior learning and experiences with their environment
- To develop a relationship with nature
- To explore at their own pace

1.5. Activities

Participation in gardening activities can include a range of activities, from planning the garden, to planting seeds and harvesting produce, to publicizing the garden in the larger community. Gardening projects have typically involved children in the hands-on tasks of planting, watering, weeding, composting, taking soil samples, and harvesting, as well as other activities related to the overall implementation and management of the garden. These activities can consist of decision-making regarding what to plant and how to distribute the harvest, record-keeping, working with adult leaders and volunteers, fund-raising, working in teams with other youth, and engaging parents and others. In some cases, how to handle acts of vandalism and accidental damage in the garden is also an area to be addressed. These activities can consist of decision-making regarding what to plant and how to distribute the harvest, record-keeping, working with adult leaders and volunteers, fund-raising, working in teams with other youth, and engaging parents and others. In some cases, how to handle acts of vandalism and accidental damage in the garden is also an area to be addressed. In addition, gardening programs often incorporate discussions regarding nutrition, healthy eating, and caring for plants, as well as incorporating math and science into the activities (Lekies & Eames Sheavly, 2007).

1.6. Scale and Design

The garden and contents should be specifically designed and scaled for children because this promotes ownership by inviting children to engage. At the PCG scale has been used both to make certain elements larger so children notice and can interact with them (e.g., a large kereru egg children climb into—popular for photos), and smaller so children feel they belong in the spaces (e.g., low tunnels). The garden design should embrace principles of unity,

repetition, and rhythm so that it flows, creating coherent connections between parts, rather than disparate sections. A focus on designing spaces rather than things to go in them is important to avoid over-scripting and cluttering. Opportunities for discovery and learning are richer if children can determine their own use of spaces (Wake, 2007). For design with any purpose (Play space, gardening space..) for children there are a list of design recommendations that are important;

Developmental Level: children at different levels of development will experience environments differently. This should be considered in any design.

Scale: children prefer small, cozy spaces where they can hide. Orient items of interest close to the ground, where their visual attention is normally focused.

Child Possession: Children should feel free to touch and play with the elements in a garden.

Minimize rules and regulations, and provide opportunities for kids to engage in activities unavailable to adults.

Aesthetics: Children prefer gardens that are pretty. Incorporate garden features that are attractive to children.

Color: Kids like lots of color, and especially bright colors. Red, orange, and yellow are among their favorites.

Landscape Elements: elements such as animals and water appeal to children. All elements, including plants, should encourage activity and participation.

Privacy: kids like garden spaces where they can do what they want apart from adults.

Accessibility: the garden should maintain the least restrictive environment as possible. However, issues such as potential for vandalism by unsupervised children must be addressed.

Place for Adults: Since adults are likely to accompany children to the garden, incorporate items of interest for adults.

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This may be as simple as providing a seating area where they can supervise children (Ohio Master Gardeners,2000).

1.7. A Container Garden as a Suggested Tool Arasit Gardening

A container garden; The practice of growing plants exclusively in containers instead of lanting them in the ground. It can be a low cost way to explore the challenges of growing fruits, vegetables, herbs, and ornamentals. Containers hold the growing medium for plants to grow in. 4 and 3. Containers require very little space and can be easily moved from one area to another. Also, with ontainer gardens, there is no need for larger equipment such as rototillers.

A container is the general term used in gardening for a small, enclosed and

usually portable object used for displaying live flowers or plants. It may take the form of a pot, box, tub, pot, basket, tin, barrel or hanging basket. Size of container will vary according to plant selection and space available (Table 2).

Containers range from simple plastic pots, teacups to complex automatic-watering irrigation systems. This flexibility in design is another reason container gardening is popular with growers. They can be found on porches, front steps, and in urban locations, on rooftops. Sub-irrigated planters (SIP) are a type of container that may be used in container gardens. Potting material must be loose and allow drainage to offer proper aeration for roots to breathe, preventing root rot (Wright, 2013)

Table 2. Advantages and disadvantages of the container garden.

Advantages	Disadvantages
<ul style="list-style-type: none"> • A gardening alternative where there is poor quality soil or limited space for growing plants. • Problems associated with poor soil, soil borne diseases, or plant arasitica nematodes can be avoided. • Plants in containers are portable, making them easy to move around. • During typhoons, plants can be moved inside. 	<ul style="list-style-type: none"> • The medium in containers will dry out quickly, requiring more watering (except in hydroponics). • Plants will require more frequent fertilization. • Containers (especially with lightweight medium) are easily knocked down or blown over. • Growing plants in containers can be expensive.

2. RESULTS

The last decade has witnessed a groundswell of enthusiasm for children's gardens and the educational programs that are closely integrated with them. Children can learn new skills, have fun, play and develop self-confidence by spending time in the garden tending plants and growing their own food. Most children enjoy being outdoors and love digging in the soil, getting dirty, creating things and watching plants grow. Childhood memories of contact with nature involve a deep sensory imprint of texture, smell, color, sound, and taste

(Acar, 2013). These spaces in nature imply a sense of freedom and serenity in which the natural elements (which include the weather) present both complexity and the unexpected. Contact with nature has also been seen to be associated with increased creativity and language development (O'Brien and Murray, 2005).

Incorporating gardening provides multiple learning opportunities for the children. Gardening can easily be connected to various subjects including math, science, English composition and nutrition, and allows children the

opportunity to experience planting seeds, caring for plants, harvesting, and tasting the results of their efforts (Ohio Master Gardners, 2000).

Gardening can also teach children:

- Respect for the Earth and its resources
- Responsibility
- Nurturing skills
- Pride in their accomplishments
- Knowledge of where their food comes from
- Healthy eating

As a result gardens give children a chance to try fresh fruits and vegetables and learn where food comes from. Kids who learn to love gardening at an early age grow into adults with a passion for plants and respect for the environment.

Gardens allow children:

- To be active and engaged in learning
- To build on prior learning and experiences with their environment
- To develop a relationship with nature
- To explore at their own pace

One of the most important topics of landscape architecture profession is to design highquality children’s gardens for children to meet their needs and expectation. These gardens range from smaller-scale school gardens, used by certain number of student, to large city parks, used by children with different age groups. One of the most beneficial activities in the children’s garden is gardening. So landscape architecture must be aware from design principles for designing these places. In order to design place for gardening there are some suggestions according to Table 3.

Table 3. Some suggestions to designing children’s garden.

Getting children interested in gardening	<ul style="list-style-type: none"> • Keep it simple. • Give children their own garden space. (This does not have to be big. You can start with a large container or a few pots.) • Involve older children in the planning and design of the garden. • Use lightweight, easy-to-handle, correct-sized tools and garden equipment. • Encourage children to dig in the dirt. (Younger children love making mud pies) • Grow interesting plants such as sunflowers, corn, pumpkins, tomatoes and strawberries. • Use a trellis or teepee to grow beans or sweet peas. • Plant flowers that attract butterflies, ladybirds and other interesting insects or birds. • Make a scarecrow. • Install a water feature, a birdbath or a sundial. • Set up a worm farm. • Visit community gardens, children’s farms or botanic gardens for ideas.
Child safety in the garden	<ul style="list-style-type: none"> • Select the correct-sized tool. • Keep sprays and fertilisers out of reach. • Do not use chemicals. Garden organically whenever possible. • Provide safe storage for equipment and tools. • Secure fences and gates.
To make the garden safe for children	<ul style="list-style-type: none"> • Provide shade in summer with umbrellas or shade cloth. • Make sure that where it’s appropriate, children wear a hat, sunscreen, suitable clothing and gumboots. • Do not leave buckets of water unattended around very young children and toddlers.
Plant selection for children	<p>Children like large, brightly coloured flowers and vegetables that grow quickly. Plants such as sunflowers, corn and pumpkins are good examples. You should also consider using varieties of plants that have sensory and textural qualities as well. (Examples of great sensory plants include:</p>

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	<p>Touch – woolly lamb's ear, succulents (such as aloe vera), bottlebrush species, snapdragons. Taste – basil, strawberries, peas, rosemary, carrots, cherry tomatoes Smell – jasmine, sweet peas, lavender, pelargoniums, native mint bush, lemon balm Bright colour – daffodils, rainbow chard, marigolds, pansies, sunflowers. Sound – corn, bamboo and grasses rustle against each other when the wind blows).</p>
Different-aged children in the garden	<p>Toddlers, preschoolers, primary-school-aged and older children will all have different expectations and will learn different things in the garden. Younger children will require careful supervision during activities. Suitable tasks for younger children include watering plants, harvesting produce and planting seeds. Older children are physically capable of handling a greater variety of activities, like digging, carrying, planting, mulching and pruning.</p>
Activities for a child in the garden	<ul style="list-style-type: none"> • Watering the garden • Digging • Picking flowers • Planting vegetables, fruits and flowers in the correct season • Feeding the worms and using the 'worm tea' from the worm farm as fertiliser. • Picking vegetables and fruits when they are ready to eat • Preparing healthy food, such as making salads and preparing school lunches. • Craft activities using harvested seeds, plants and flowers • Composting, recycling and mulching • Weeding • Gathering seeds and dried flowers. • Deadheading flowers
Choose activities that suit the child's age	<ul style="list-style-type: none"> • Preparing the soil with organic fertiliser • Replanting and re-potting.

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