

Biodynamic urban farming

The case for city centre rooftop gardens

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INTRODUCTION

Argent College is a specialist college for young people with complex needs. Located in an area of urban renewal in the Jewellery Quarter in Birmingham City Centre, Argent has been in the process of developing a roof top garden as part of its therapeutic education provision. The roof top garden will become a key feature of the student curriculum, whereby students will be directly involved in food production and engage with the educational, developmental and therapeutic benefits that gardening has to offer. The creation, management and use of the roof top garden at the college will reflect the inspirations and insights of Rudolf Steiner, which underpin the Practical Skills Therapeutic Education Method of the Trust, and the principles of biodynamic agriculture within the context of growing the land and growing people.

Working with the land through biodynamic practices is a key feature of Ruskin Mill's educational method of Practical Skills Therapeutic Education (PSTE), whereby in growing the land and engaging with the plant, animal and mineral kingdom, students themselves 'grow'. The health and wellbeing benefits arising from land work and horticultural activities have long been recognised.

Health and wellbeing arising from a 'seed to table' curriculum are key features of Ruskin's PSTE method. Food produced by students and gardeners from the roof top garden can be used in the preparation of meals for students and staff, supporting healthy eating and nutrition. Likewise, as the garden becomes more productive, the food produced can be sold through the café, as part of social enterprise initiatives and the contribution of students back to the community.

The case for roof top gardens

As population densities increase and concerns exist over food security, urban farming is increasing in popularity, with roof top gardens appearing in city centres around the world. Estimates suggest that around half of the world's population currently lives in an urban setting,



Figure 1: the first crop of carrots

Health and wellbeing benefits

'Seed-to-table' curriculum



Figure 2: Artist's impression of the rooftop garden at Argent College prior to its development

often at a distance from the rural areas of production. Emerging through community supported agriculture schemes or local food and growing initiatives to make the most of what otherwise might be 'dead space', roof top gardens are appearing in the skies above towns and cities, offering a variety of benefits for the environment, society and the economy.¹

The ambitions of roof top gardens are typically threefold:

1. SOCIAL – as an educational tool, in community integration, as a therapeutic tool
2. ENVIRONMENTAL – in terms of temperature control, hydrological management, encouraging biodiversity
3. ECONOMIC – in relation to social enterprise, sustainable development, food security and/or food production.

The intention of the roof top garden at Argent College is to integrate all these three ambitions, and braid them into the student curriculum.

The concept of roof top gardens is not new. It is often claimed, for example, that The Hanging Gardens of Babylon, one of the seven wonders of the ancient world, are an early example of a roof top

¹ Novak, A. 2016. *The rooftop growing guide: how to transform your roof into a vegetable garden or farm*. Ten Speed Press, NY.



Figure 3: The realised rooftop Garden at Argent College

garden.² Recent examples of roof top gardens can be seen in cities across North America and Europe, with Brooklyn Grange³⁴ in New York being amongst the largest, at 2.5 acres and producing 50,000 lbs of organic vegetables per annum. Likewise, the 8,500 square foot roof top garden in St Louis, Food Roof,⁵ boasts the potential of capturing 17,000 gallons of storm water per storm event, which would otherwise be lost as run-off, in addition to producing 100 varieties of edible plants.

Rooftop gardens around the world

Within the UK, examples of roof top gardens are limited. In 2011 the innovative 'Food from the Sky' project in London's Crouch End, where a food producing garden was built atop a supermarket was highlighted. Other projects within the UK include Guild Farm,⁶ where Farm Urban has installed a farm in the roof of the Liverpool Guild of Students. Not only does this showcase the sustainable growing techniques, but it also provides food for the Guild. Similarly, the new Students' Union building at Coventry University also has a roof garden. In addition, the RICS

Rooftop gardens in the UK

2 Eva Worden, Diana Guidry, Annabel Alonso Ng, and Alex Schore (2010) *Green Roofs in Urban Landscapes*, ENH 984, University of Florida. <http://www.cordon-line.net/HiESTbiology/green/documents/greenroofs.pdf> (accessed 16/12/16)

3 Cole Plakias, A. 2016. *The Farm on the Roof: what Brooklyn Grange taught us about entrepreneurship, community, and growing a sustainable business*. Random House, NY.

4 Brooklyn Grange, New York, <http://www.brooklyngrangefarm.com/farms-1/> (accessed 01/12/16)

5 Food Roof, St Louis, <http://www.urbanharveststl.org/food-roof-farm/> (accessed 01/12/16)

6 Guild Farm, Liverpool, <http://www.farmurban.co.uk/projects/> (accessed 01/12/16)

roof garden, built on top of a conference hall in Reading, was designed as an educational tool using permaculture principles.⁷ However, current information on roof top gardens within the UK is limited, and a systematic review of their presence and impact would be useful.

BIODYNAMIC PRINCIPLES

The question arises: can biodynamic principles be applied in the context of a rooftop garden? The question about the urban application of biodynamic agriculture was raised by Rebecca Briggs in 2011 in her 'Letter from the Editor'⁸ for the *Biodynamics journal*. Biodynamic agriculture is based upon the concept of the whole farm organism, with an emphasis on the importance of soil quality and integrated systems. However, Conway (1987) suggests that it is reasonable to look at a rooftop farm as a discrete farm organism, in as much as it has properties of agroecosystem, and will establish its own ecology on the roof.⁹

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As Rebecca Briggs explains in her 2011 article on the River Road Gardens at the Tuscan Waldorf School, typically a biodynamic farm will use composted manure from the local site or from animals' characteristic of the locality. Within the context of an urban roof garden, such manure is generally not available, and needs to be transported from outside the locality. Additional questions about manure that reflects animals in the locality can be considered both on a temporal and spatial basis – 'in the past' or 'close by'. However, many of the biodynamic preparations can be prepared and used on site. Whilst the issue of manure is relevant and important, there is plenty of precedent for biodynamic farming methods being applied without livestock. Biodynamic market gardens that lack connection to a farm sometimes import manure, and try to generate the bulk of their fertility from plant material. Questions around the integrity of a farm organism arise in stockless biodynamic holdings. Proponents attest to rigorous assessment of the quality of manure (e.g. from non-intensive livestock holdings, GMO free etc.), use of the preparations and where possible to build long term mutual relationships with local farms which supply animal manure.

The whole farm organism

In light of the whole farm organism, whilst raised growing beds are artificially bounded, a socio-ecological system can emerge as people interact with the land and guided by the cosmic calendar¹⁰ (for planting, harvesting etc.) and biodynamic principles. As the garden develops, inevitably the biodiversity of the site will be enhanced with insects and other wild (urban) life, particularly through the deeply mutual relationships of plants and insects. Insects in particular are seen to bring

7 <http://risc.org.uk/gardens> (accessed 19/01/17)

8 R Briggs, Letter from the Editor, *Biodynamics* <https://www.biodynamics.com/spring-2011-biodynamics-journal> (accessed 01/12/16)

9 Conway, G.R. 1987. *The properties of agro-ecosystems. Agricultural Systems*. 24. Pp. 95-117.

10 Peterson, J. 2013. *Awakening to the social organism of the farm and the design of social space*. Stir, Spring 2013. Pp.36-43.



Figure 3: The realised roof top garden at Argent

an ‘ensouling’ of the plant communities through pollination and evoke a primary layer of the ‘animal element’ in the development of the ‘farm’ organism. In this way, urban communities can potentially be encouraged to engage with the land and the universe around them through the principles of biodynamics, guided by the lunar calendar, reconnecting them more widely to their environment. In relation to a rooftop garden or farm, one might then ask ‘what do we mean by the biodynamic social organism’ as well as the concept of ‘the farm organism?’ These are pertinent questions, and worthy of exploring further. In simple terms, what can biodynamics offer urban social environments, beyond that of a typical roof top garden or farm?

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Through socio-economic, environmental and ecological outcomes, the notion of the farm organism, as central to biodynamics, can potentially grow within an urban, non-traditional agriculture setting. This has the potential to create a holistic system that reconnects land, plants, wildlife, people and produce within a social-economic-environmental and ecological relationship between the earth, the universe and people, thus realising the potential of not only students (the Ruskin Mill Vision), but also the potential of place.

Holistic systems for re-connection

Challenges for rooftop gardeners

Challenges faced by roof top gardeners are many and can include:

- How can soil media be biodynamically treated to enhance plant vitality, quality and yield in an urban growing environment?
- How can the problem of the flushing out of nutrients from the soil be addressed?
- What is the optimum growing medium, including the finer qualities of that medium, as this is critical to the success of any roof top farm or garden?
- How can we design a rooftop garden or micro-farm to provide the optimum educational and therapeutic environment for our purposes?

Looking forward

The team at Ruskin Mill Trust, and in particular Argent College, are keen to explore how the roof top garden can be effectively woven into the student curriculum for the benefit of the student, and how the garden can be woven into the wider community. As part of longitudinal research, the team is seeking to identify the affordance of the roof top garden at Argent College – in relation to the social, therapeutic, ecological, environmental and economic benefits for the students and the community, over time. This endeavour forms part of a wider research project into the educational and restorative benefits of gardening as part of the student curriculum, through reconnecting people and nature.

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