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Rooftop farming: Food production, social and ecosystem service provision and sustainability analysis in the city of Bologna, Italy

Francesco Orsini, Daniela Gasperi, Giuseppina Pennisi, Esther Sanye-Mengual and **Giorgio Gianquinto**
University of Bologna, Italy

The contribution of urban farming to city food supply has been estimated in a number of cities across the world. However, its full recognition has been hindered by a lack of good quality, reliable data, given that comprehensive research has scarcely addressed this topic. The city of Bologna (Italy) has always been at the forefront of urban agriculture in Italy. The commitment of the local municipality and university (where the first Italian Research Centre on Urban Horticulture and Biodiversity was recently established) has recently led to the implementation of the first rooftop farming municipal programme in social housing buildings in Italy. These community gardens are promoted for their multifunctional role, which spans from food production, to a range of social and ecosystem services. The present work will present research activities aimed at the definition of food potential productivity and a range of ecosystem service provision associated with rooftop farming. The study is implemented on the basis of experimental trials on a pilot rooftop garden (over 200 m^2, hosting three simplified soilless systems and eight vegetable crops over three years of experimentation), and then extended to the city flat rooftops identified by aerial images and determined making use of a computer-aided design (CAD) software. The study enabled to estimate that, if the 82 ha of available rooftops in the whole city would host simplified soilless gardens, a potential yield of 12,500 t year-1 could be obtained, covering more than three quarters of the city vegetable requirements. In the same case study, other potential benefits are addressed, including the creation of green corridors for biodiversity (up to 94 km of green corridors and a density of 0.67 km km^{-2}), as well as the overall environmental and financial sustainability of the proposed growing systems. According to the survey, cultivation technique, crop yield and crop period strongly affected the environmental and economic outputs. For leafy vegetables, most environmentally-friendly options were the floating technique in summer crops (65-85% lower) and substrate production in winter (85-95% lower), whereas a simplified nutrient film technique was the least recommended option. In substrate production, eggplants and tomatoes were the fruit vegetables that showed best environmental performances. For all types of production, irrigation turned out to be the most environmentally impacting element, therein suggesting to implement rainwater-harvesting systems or integrate greywater-regenerating units. On the other hand, the utilization of re-usable elements and the relative use intensity of the garden improved the sustainability performance. The financial viability of the production of leafy vegetables was maximised in the floating system (0.67 € kg-1), whereas among tested fruit vegetables grown on substrate, best performances were associated with eggplant (0.13 € kg-1) and tomato (0.16 € kg-1). Consistently, rooftop farming production resulted to be an environmental friendly option for further develop urban local food security.

f.orsini@unibo.it

Assessing the market premium for organic certification among Canadian community supported agriculture programs

Yuan (Linda) Zhou
University of Manitoba, Canada

Community supported agriculture (CSA) is a farming concept that allows growers and consumers to partner together to share the risks and benefits of food production. This study examines the impact of organic certification on Canadian CSA share prices. I used Canadian CSA data collected from online sources that documents CSA share prices and characteristics of CSA farms. Results suggest that CSA farms that self-identify as organic charge a 13% premium over conventional farms. I also found that CSA farms that are certified organic, charge a 17% premium. These premiums are not statistically different from each other, which suggests that organic certification does not increase the premium relative to uncertified organic. It appears as though CSA, which is a direct marketing concept, acts as a substitute for third-party certification. This study also identifies several parameters that are important for CSA programs, namely the number of weeks the CSA provides produce, the average number of vegetable varieties and the number of pick-up locations.

linda.yuan.zhou@gmail.com