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Small can be beautiful for organic market gardens: an exploration of the economic viability of French microfarms using MERLIN

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Highlights

- â€¢ Microfarms are small-scale innovative organic market gardens.
- â€¢ A simulation model was used to study the economic viability of microfarm scenarios.
- â€¢ Viability was assessed based on contrasted income and workload criteria.
- â€¢ Global redesign is more profitable than input substitution for microfarms.

Abstract

Microfarms are commercial soil-based market gardens cultivating organic vegetables with less than 1.5 ha per farmer in rural France. Microfarms typically grow crops in both outdoor and protected (tunnel) areas. Despite their growing popularity among young farmers with no agricultural background, there are no data on expected income generated by these small-scale farms. Our objective was to determine the economic viability generated by a given agricultural area based on distinct microfarm scenarios. We used the stochastic model MERLIN to simulate 18 microfarm scenarios combining three technical systems (varying with respect to the mechanization level, use of commercial inputs, cropping density, and number of cropping cycles per year), two marketing strategies (varying with respect to the length of the selling period and the range of crops grown), and three investment hypotheses (varying with respect to the level of bank loans and the percentage of workload used for self-built equipment). Viability was calculated from the number of simulations that generated a selected minimum monthly income (600, 1,000, or 1,400 Euro) for a maximum annual workload (1,800 or 2,500 h).

This study shows that organic microfarms can be made economically viable in some cases but that the risks of not reaching viability in microfarms are not to be neglected. For microfarms, system redesign based on low mechanization, higher cropping density, more cropping cycles per year, low-input practices, lower fixed costs, and lower initial investment (manual and bio-intensive system with tiller cultivation) was more favorable (meaning a higher modeled viability) than input substitution (classic system) at a small scale. A 9-month selling period without winter storage crop cultivation led to higher viability than a 12-month selling period with winter storage crop cultivation. Low-cost investment strategies based on self-built equipment and second-hand materials led to lower viability than high-cost investment strategies that purchased equipment because the low-cost strategies increased the workload. Further research on microfarms should integrate other types of production and activities, such as small-scale breeding and on-farm processing and examine in which extent collaborations between microfarmers and larger scale farms could contribute to reshape farming systems and impact rural communities beyond the gate of microfarms.



Keywords

Agroecology; Short supply chains; Permaculture; Urban agriculture; Small farms; System redesign

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