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# What about Growing Plants on Non-Composted Straw?

**Medici OL[1], Fonseca de Carvalho D[2] and Reinert F[3]***

[1]Department of Physiological Sciences, Universidade Federal Rural do Rio de Janeiro, Institute of Biology, Brazil

[2]Department of Physiological Sciences, Universidade Federal Rural do Rio de Janeiro, Institute of Engineer, Brazil

[3]Department of Botany, Universidade Federal do Rio de Janeiro, Institute of Biology, Brazil

**Opinion**

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***Corresponding author:** Reinert F, Department of Botany, Universidade Federal do Rio de Janeiro, Institute of Biology, Brazil, Tel: (21) 3938-6328 e 3938-6676; E-mail: fernandareinert@gmail.com

## Opinion

Organic agriculture has gained social, political and scientific recognition worldwide mainly because it is based on the application of agro-ecological strategies using local resources to produce agrochemicals-free vegetables of in a fair trade chain [1]. However, organic agriculture may also cause environmental impacts, brought about by practices such as excessive application of organic manure [2]. The use of organic manure, by its turn, may increase the production cost associated with labor required for the composting process and/or its transportation from the producer's site. Therefore, it seems the ideal sustainability of organic agriculture remains an important issue and organic plant nutrition is one of the scientific challenges to be addressed [3].

One way to grow plants in organic systems is in small containers, such as pots or plastic bags, which, with careful handling, are capable of reaching the production rate of conventional systems. Organic producers in the United States have grown vegetables, ornamental plants and medicinal herbs in that system and often cite the nutrient management as a major challenge [4]. The organic *potponics* is an organic production system in which solid fertilizers are manually supplied to pots, while the irrigation is sensor-based automated [5]. Therefore, nutrients and water are applied independently, in contrast to the *hydroponics* or the *fertigated* systems, in which it is necessary to discard part of the nutrient solution and apply a leaching fraction in order to avoid imbalance of nutrients or salinization of the substrate [6]. The organic potponics system was efficient for the production of lettuce, but for tomato, as the nutrient demand is higher, an alternative substrate was tested. Soil was replaced by dried leaves of grass and legumes (for instance, *Paspallum notatum*) showing excellent potential results.

In this non-composted straw system, tomato plants were grown almost solely on dried leaves as substrate (individual 8L pots with 0.5L of poor soil exclusively to support plants upright and avoid inhibition of root growth due to high porosity between dried leaves). Production was, on average, near to that of organic cultivation in pots. Calcium deficiency observed during the experimentation period was directly mitigated by the addition of more dried leaves. These pilot experiments reassures that it is possible to grow plants directly and solely on the expenses of non-composting residue dried leaves, avoiding or reducing the impacts associated with manure based nutrition. Such exploratory initiatives are indispensable to shake current paradigms on how can one grow plants making better use of plant-born resources in order to shortening carbon and nutrient cycles while cutting production costs.

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