ECONOMIC BENEFIT OF GREENHOUSE PRODUCTION OF PEPPERS IN SOILLESS CULTURE

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Greenhouse production of colored peppers using soilless culture can be considered as a valid alternative to field production using methyl bromide. Several growers in Florida are growing colored peppers in protected culture, or considering this transition as the method offers advantages compared to field production. In addition to avoiding problems associated with soil fumigation yields are up to ten times higher than field produced peppers. The fruit is protected from sun, wind, soil and rain splash and the humidity is low, so the incidence of fungal diseases is decreased and fruit quality is improved.

U.S. consumption of mature colored bell peppers has been increasing over the past decade. There is a demand for greenhouse-grown red, yellow and orange peppers and the need is met primarily from imports. The land area devoted to greenhouse production of colored peppers has increased substantially over the past decade, Spain (10,000 ha), the Netherlands (1,200 ha), Canada (144 ha) and Mexico (165 ha). Compared to this the area of greenhouse production is small in the US (~14 ha in Florida) but it is increasing steadily.

The Protected Agriculture Project (PAP) at the University of Florida was established in 1999 as a demonstration project. Research is conducted on crop production inside screened plastic greenhouses with passive venting. These greenhouses are commercially produced and relatively economical ($2-$4 ft^{-2}). Greenhouse production systems from other locations are adapted to function effectively under Florida conditions. Production systems have been developed for growing colored peppers with minimal use of pesticides in soil-less culture.

The production system involves growing peppers over 40 weeks of the year. Five-week-old seedlings are transplanted into 12-L pots containing soilless media, with perlite, peat mix or pine bark at the beginning of August. Plants are irrigated and receive nutrients through a drip irrigation system. Plants are trellised according to the “Spanish” system in which vertical poles and twine extended along the rows support plants to a height of 1.8 m. At the PAP yields have been comparable between the “Spanish” system and the more conventional “V” trellis system used in Canada and Northern Europe. Advantages to the Spanish system in Florida are that no pruning is required, thus lowering labor costs.

Harvesting starts at the end of October and continues until the end of May. Yields of between 7 and 15 $kg.m^{-2}$ were attained in trials at the PAP this compares to average field production of 3.3 $kg.m^{-2}$. In a cultivar trial conducted at the PAP the performance of 36 pepper cultivars was tested under Florida conditions, 'Amos', Pekin' and 'Lion' produced the greatest marketable yields of the red, orange and yellow cultivars, respectively

Prices of peppers averaged over the past ten years using prices from the Miami terminal show a large price differential between field grown peppers that average $0.91/kg for green fruits and $1.60/kg for yellow and red fruits, compared to an average price of $4.80/kg for imported greenhouse grown red yellow and orange peppers.

Higher yields and quality combined with the price differential between greenhouse grown and field produced peppers makes greenhouse production of colored peppers a promising alternative to field production using methyl bromide. Greenhouse production in Florida requires less energy for heating during the winter months than in other areas of the US or in northern Europe..

Advantages to greenhouse production of colored peppers in Florida.

- Soil fumigation in not required.
- Yields per acre up to ten times greater than field grown
- Quality of fruit is increased.
- Incidence of most fungal diseases is reduced.
- Incidence of bacterial diseases is reduced.
- Insect vectored viruses are not a problem in screened greenhouses.
- Fruit can be produced and marketed as pesticide-free.
- Season can be extended for eight months of the year.
- Energy costs for heating are reduced compared to colder climates
- Increased efficiency of water use.

Disadvantages

- Start-up costs for greenhouse production can be high.
- Grower knowledge deficit: growers are skilled at highly intensive field production. They must adapt their skills for greenhouse production.
- Powdery mildew may be a problem but can be controlled.

Greenhouse production of colored peppers is a serious alternative to field production of peppers with methyl bromide.

References available at: **http://www.hos.ufl.edu/ProtectedAg**