

Grafting for Season Extension and Yield in High Tunnel Cucumber Production in New York

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Consumers increasingly seek locally grown produce beyond traditional harvest windows.

In response to this demand, New York is now the national leader in winter farmer markets. USDA credits hoop house technology, or 'high-tunnels' as a factor in this growth. "Hoop houses have allowed growers to produce locally-grown products for longer time periods and in colder climates." ¹ These soil based, passive greenhouses bring a product to market 6-8 weeks before the field.



Average Temperatures in Degrees F, 2010

Date	Tunnel Air	Outdoor Air	Tunnel Soil	Outdoor Soil
3/23-4/15	61.8	47	55.2	48.5
4/16-5/15	67.3	53.3	59.8	52.1
5/16-6/15	73.8	65.4	70.6	67.6



The Cornell Vegetable Program is investigating the use of cold hardy rootstocks, in combination with tunnels, to further extend the harvest window.

Cucumbers are a high yielding, and potentially profitable crop.²

Tunnel Size (sq ft):	3,000
Number of Plants:	1,500
Variety or Cultivar:	Presidio
Yield (# fruit):	64,950
Marketing (\$/fruit):	\$0.33
Total Revenue	\$21,433.50
Total Costs	\$5,609.70
Total Profit	\$ 15,823.80

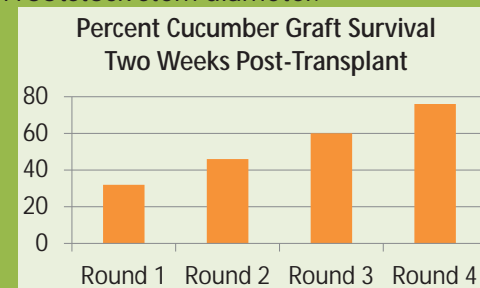
Return per Square Foot = \$5.27

Our research has found cucumbers to be a remarkable crop for New York high tunnel production, given their quick maturity and heavy yields.



Grafting can increase cold tolerance and potentially increase yields.

For the past 3 years the Cornell Vegetable Program has conducted grafting trials with high tunnel cucumbers. In 2012 we improved upon our previous grafting attempts by introducing a misting table to the healing process and multiple seeding dates of our scions to improve the match with rootstock stem diameter.



Grafting of cucumbers remains a challenge, however by the end of this project our survival rate had increased to 76%, a level approaching commercial acceptance. The challenges to this process include rootstock shoot competition with scion, matching stem diameters and a long healing window.

Cucumber Yield (lbs/plant)			
Variety	2010	2011	2012
Diva	4.14	6.20	7.37
Diva- Grafted	10.57	6.40	8.66
Manar	8.36	--	--
Manar- Grafted	9.28	--	--
Tamazula	--	--	9.69
Tamazula- Grafted	--	--	9.90
Presidio	--	--	9.45
Presidio- Grafted	--	--	8.20

Cited Sources:

1. Winter Farmers Markets Expand, Now More than 1,200 Locations for Fresh Local Foods. (2011). Retrieved October 22, 2012. www.usda.gov
2. High Tunnel Greenhouse Cucumber Variety Trial, 2011. Retrieved October 22, 2012. http://rvpadmin.cce.cornell.edu/pdf/submission/pdf48_pdf.pdf

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