

## Variety Trials for Overwintering Onions in New England

More and more growers are looking for ways to extend their growing season, including overwintering crops in the field for early spring harvests. The UMass Extension Vegetable Team, in collaboration with Becky Sideman of the University of New Hampshire and with support from NE-SARE, has been conducting research trials on the viability and efficacy of overwintering fall seeded crops in low tunnels. We have studied overwintering carrots, kale, mustard greens, spinach, beets and onions. Here we present our findings on onion varieties, the crop we had the most success overwintering.

### ONION VARIETY TRIAL

The goal of the onion trial was to determine which varieties would produce the best quality and highest yield for spring markets. We compared eight onion varieties over two winters and found significant differences in bulb number, size, and weight as well as premature bolting. The UNH onion reports, authored by Becky Sideman and Heather Bryant, are available here

[http://extension.unh.edu/resources/files/Resource003239\\_Rep4688.pdf](http://extension.unh.edu/resources/files/Resource003239_Rep4688.pdf).

### METHODS

Both years, onions were seeded in the greenhouse in August and then transplanted at 6 in. spacing into 2.5 ft. raised beds covered with black plastic. A randomized complete block design was used with 4 replicates of 10 ft. each (60 onion plants) per variety. Low tunnels were constructed of metal conduit hoops placed 5 feet apart, covered with row cover (Dupont 5131, 1.25 oz/sq yd) and later with an additional layer of 6 mil greenhouse plastic. In the 2011-12 trial, onions were seeded August 18, and transplanted October 11. Row cover was applied on October 27 and plastic on November 17; covers were removed March 21. Scallions (cv. Winter white bunching) were harvested on April 10 and bulb onions on April 19, when there were fresh green bulbs and tops were vigorous. In the 2012-13 trial, onions were seeded August 19 and transplanted on October 9. Row cover and plastic were applied on October 26, in anticipation of the hurricane. Plastic was removed in mid March and row cover was removed on April 17. Onions were not harvested until May 22, to allow bulbs to grow larger although greens at that point were of lower quality. At harvest, onion survival and bolting were recorded. Thirty onions were harvested from the center of each replicate plot and total and marketable weight was taken. Bulb size (mm) was measured for ten onions per replicate. Varieties evaluated were Bridger, Candy, Top Keeper, Keepsake and Winter White Bunching (scallion type) in 2011-12 and Bridger, Copra, Patterson and Pontiac in 2012-13.

### RESULTS

**Transplant survival was high for all varieties in both years**, with 94-99% survival in 2011-12 and 89-96% survival in 2012-13.

**Bolting was strongly correlated with variety.** In 2011-12, we saw no bolting in the Winter White Bunching, Bridger, Keepsake or Top Keeper onions; however, 28% of the Candy bolted. At the time of harvest, most of the bolted Candy onions were still considered marketable because they had just begun to bolt. In 2012-13, when we harvested later in crop development, 79% of the Patterson, 73% of the Copra, and 55% of the Pontiac had bolted, as compared to only 3% of the Bridger.

**Most of the onions harvested were marketable**, with only a few showing animal damage or appearing dramatically undersized. This was true for all varieties. In 2011-12, we did see minor thrips damage on the leaves. With the mild winter, thrips appeared able to overwinter inside the low tunnels. While thrips were not a problem in the colder 2012-13 season, three out of the four varieties bolted before bulbs sized up in that year. **Significant differences in yield were found between varieties.** In 2011-12, Keepsake and Top Keeper produced the largest bulb sizes and highest marketable weights. In 2012-13, Bridger was the clear winner, with significantly higher bulb diameter and marketable weight than the other varieties.

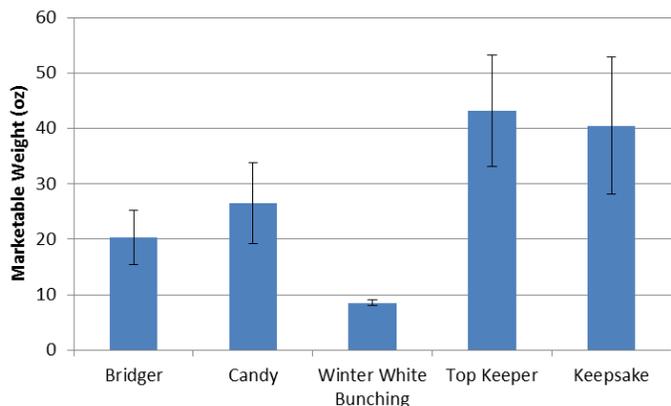


Figure 1. Marketable weight of onions at harvest in 2011-12 trials.

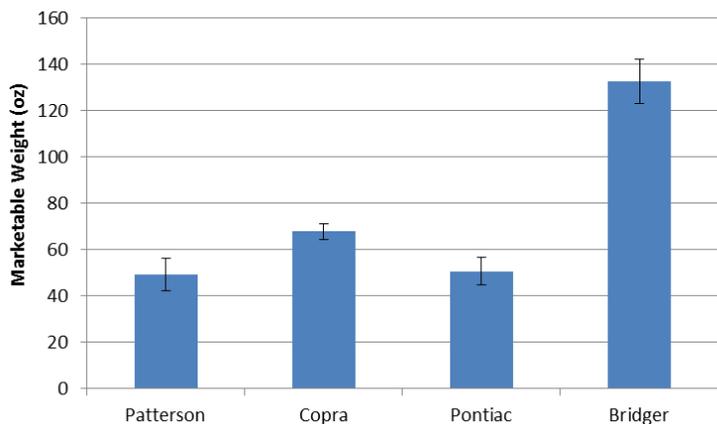


Figure 2. Marketable weight of onions at harvest in 2012-13 trial. Note that in the second year, greens were removed to calculate marketable weight due to bolting, but that onions had an additional month to grow.

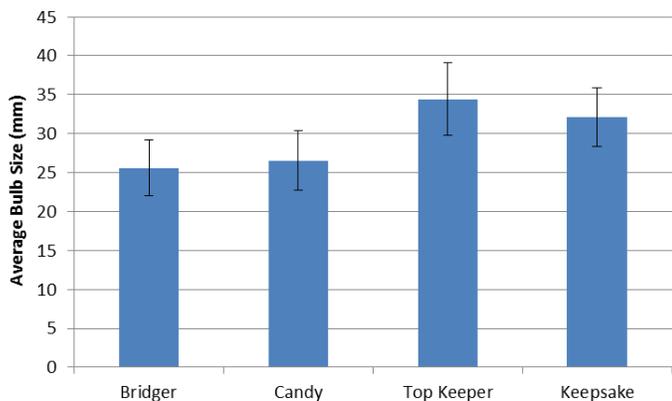


Figure 3. Average bulb size (mm) for 10 onions per replicate for 2011-12 trial.

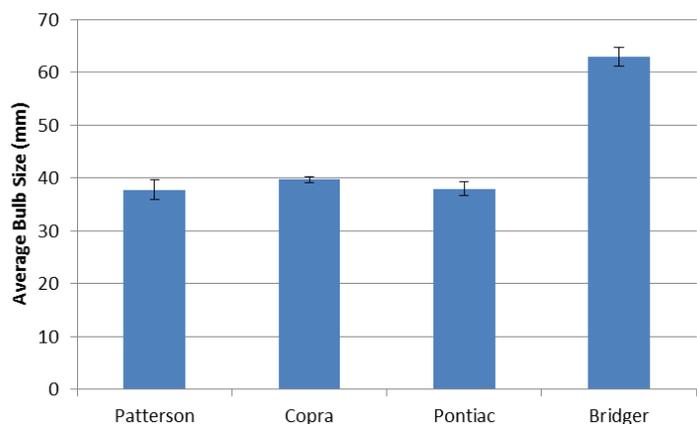


Figure 4. Average bulb size (mm) for 10 onions per replicate for 2012-13 trial.

## CONCLUSIONS

Based on these trials, Keepsake, Top Keeper and Bridger varieties performed best and would be recommended for overwintering in low tunnels in MA. These varieties produced large bulbs, high marketable weights, and were not susceptible to bolting. The harvest window has some flexibility, depending on market demand, the need to clear the field for spring crops, and the stage of bulb formation that is desired.

A surprising finding of the trial was the successful overwintering of onion thrips in year one. Thrips were present in summer 2011 on onions and fall Brassicas growing in fields near the tunnels. It was a mild winter, and thrips were able to overwinter and reproduce on onions in the low tunnels. On April 10, 2012, 90% of our plants had at least 5 thrips per leaf. While little damage was seen at harvest, thrips injury could have been significant if the crop had continued to grow. As winter production expands, the survival of pests in greenhouses, high tunnels, and low tunnels is a major concern. This pest issue should be carefully considered as season-extending practices are incorporated into diversified farms.

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