**Variety Trial for Overwintered Spinach Production in Low Tunnels**

**INTRODUCTION**

In response to increasing demand for local vegetables, growers are extending their production into the colder months. Low tunnels are one cost-effective option for prolonging the fall harvest season until just prior to snowfall, as well as for growing hardy crops for early spring harvest. These temporary, unheated structures afford less winter protection than the more widely used high tunnels, and are often inaccessible after snowfall. However, low tunnels with quick hoops can be erected for $0.50-$1.00 per square foot, estimated to be 5% of the cost of a 4-season greenhouse (Coleman 2009) or 15-30% of the cost of an unheated tunnel (Sideman). They also offer the advantage of being easily moved, allowing rotation of winter production areas. Low tunnels have been shown to provide sufficient winter protection for hardy fall-planted crops to survive, and speed up spring harvest by 4-5 weeks. Farmers have found that low tunnels can work for overwintering crops of the Brassica, allium, Chenopodia and umbel families. We explored the potential for inexpensive production of spinach under low tunnels, and evaluated varieties to maximize spring yield and quality.

**METHODS**

We established 100’ long low tunnels over 5’ raised beds covered with black plastic mulch. Our hoop system consisted of 10’ PVC pipe bent over rebar spaced 2.5’ apart. We tested two varieties of Savoyed spinach, Tyee and Spargo, two smooth-leaf varieties, Space and Red Cardinal, and a hybrid known as Corvair. Spinach was seeded in the greenhouse on September 9, and transplanted to the field on October 11. The plants were covered with a layer of 1.25 oz row cover on November 2, around the date of first frost, and a layer of 6 mil Greenhouse plastic was added on December 13. Greenhouse plastic and row cover were removed on March 21. We harvested spinach on March 26. At times of harvest, we recorded % survival, % bolting, and marketable weights.

**RESULTS**

All the varieties we planted showed high survival, with 94% or more of plants surviving the winter. Across all plots, we experienced some problems with tip burn, limp or crunchy leaves, and gooey or slippery stems. Plants also sustained aphid damage. Bolting was essentially a non-issue, except in the Red Cardinal variety, in which 75% of plants had bolted by March 26.

Marketable harvest weights were low. Red Cardinal had the highest yield, followed by Spargo, Space, and Tyee (see graph below). Due to X, we were not able to carry out a second harvest. NOT SURE WHAT TO SAY?? RED CARDINAL HAS HIGHEST SURVIVAL AND YIELD, BUT A TENDENCY TO BOLT…