

Report on High Tunnels for season extension in Interior Alaska

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High tunnels are very much in the news in almost any publication or horticultural crops. They use the simple concept of covering a relatively large area in an enclosed space to modify the growing environment. The result is temperature control and protection from wind and heavy rains resulting in increased yields and season extension. They differ from heated greenhouses in that no heating source is added and from the smaller "hoop-house", common in many gardens in Alaska, in that the larger area enclosed and higher ceilings add much more volume of air inside the structure. This moderates temperature fluctuations and keeps the growing area warmer for longer stretches. Their greater size also allows for less "edge effect" within the structure. The added benefit for the larger size and higher ceilings is that a small scale grower can use a tractor inside the high tunnel for tillage and bed preparation.

We had heard of high tunnels being used throughout Europe and the lower 48 for several years, but were curious that growers in Interior Alaska were not using high tunnels. Most growers were using heated greenhouses for spring start-up and growing traditional greenhouse crops, e.g tomatoes. But no grower was using high tunnels for production here. In 2007 we constructed our first high tunnel - a 30' X 96' kit from Oregon Valley greenhouses. We modified the end walls to come apart in panels so that they could be removed simply to drive the tractor through. We were able to set up six eighty foot beds in our original high tunnel and starting to plant salad greens and head lettuce on May 1, a full month earlier than we plant our field crops. By the third week in May we were harvesting salad greens and by the first week in June we were harvesting head lettuce. We were able to harvest 200 pounds of greens 300 heads of lettuce and by June 15 in both 2007 and 2008. This was a value of close to \$4000 in gross sales at our farmer's market. We then transformed those beds into cucumbers, cut flowers, peppers and melons starting in mid to late June further increasing revenue from those structures. In all we found that we can harvest \$5000 to \$8000 in gross crop sales from that one 30x96' high tunnel in one season.

In 2008 we applied for an Alaska Agricultural innovation grant to construct a second high tunnel to increase early season production so that we could start our 100 member CSA earlier in

increase revenue on our farm. We had originally intended to put up a large 80' X 300' tunnel from Haygrove High tunnels but because of the cost, we had to scale down our ambitions and erected another 30' X 96' tunnel from Oregon Valley Greenhouses. While there is nothing particularly innovative about purchasing a structure from a kit, it does have advantages. Our primary concerns were time and expertise. Although we had constructed a large greenhouse and hoopouses on our farm from both our design and from local wood products, for our high tunnels we wanted steel construction and those are most readily available from premade kits. Although the transportation costs are high, they are more than made up for in the time it takes to design, plan and scout and collect materials. In addition a large high tunnel erected from a kit is assembled quite rapidly. Our 30' X 96' structures were delivered to our door on a truck and assembled in a few days. We are also benefiting from the expertise of greenhouse engineers who designed out high tunnels. They have worked out the problems of greenhouse design and were available for questions when we were purchasing and assembling our structures.

Although we are able to plant in our high tunnels in late April to early May, it can still be cold in Interior Alaska. The heat generated inside the tunnel during the day does warm up the soil which can radiate heat during the night; still we cover up crops within the tunnel if the temperature drops. If the temperatures drop to the ~20 degrees F at night, greens and lettuce are generally safe from freezing, but if the temperature does drop lower, then the crops do benefit from row covers such as 19 to 30 weight Agrobun or Remay within the high tunnel. We could even push the planting to mid-April in a warm year with our only limitation being our well line thawing so we can water-in the crop. All our salad mix is planted from 98-cell plug flats started in mid to late-March in a heated greenhouse and then planted into the high tunnel beds during planting time in late-April to early May. Head lettuce is similarly started and planted. Only radishes are direct seeded that early.

We have not yet worked out is the transition from the early greens and lettuce crop to the second crop to plant into the tunnels in the 2 years we have used them. Our first crops are normally harvested-out by mid-June, which is about 2 weeks late for planting cucumbers, peppers, melons or tomatoes which would benefit from the high temperatures in the tunnels in mid-summer. Planting greens in the tunnels during the hot weather of July would not benefit our operation since we are growing greens in our field by then. Although we do have roll-up sides on our high-tunnels, temperatures can reach well over 90 degrees F on hot days. One possibility is to let the beds in the tunnel go fallow for much of July and then plant them with later greens in August which would allow us to harvest through September. Once a crop is removed from the tunnel we usually need to wait a week after the crop is tilled under to plant another crop in its place. We have gotten a good cucumber crop by late July (one month after planting), but it would be preferable to get them in mid to late May. We have determined that

for our operation we need two tunnels in early and late greens and 2 more tunnels saved for warm weather crops that would benefit from a longer season even under cover.

If anyone has any questions for us, wants to visit our farm or see videos of our tunnels “in action”, please do not hesitate to contact us.



High tunnel construction November 2008



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