

# Recommendations for Improving Winter High Tunnel Spinach Production

## Variety Selection:

- **Plant varieties with the latest, broadest downy mildew resistance (1-17):** In [our most recent variety trial](#), Dallas, Crosstrek, Nembus (all 1-17 varieties), Patton (1-15, 17), and Responder (1-12, 14-16) all performed well.
- **Plant multiple varieties** so that all gaps in resistance are covered and to maximize protection against novel strains

## Bed and Tunnel Preparation:

- **Keep soil pH above 6**
- **Prepare uniform beds:** We have found that spinach stand is very sensitive to soil compaction and moisture, so efforts to make uniform, slightly raised beds can improve stand.
- **Set up uniform irrigation:** Spinach seedlings are sensitive to damping off in cold soil, so ensuring that there are no wet spots in your tunnel can help reduce damping off and improve stand.

## Seeding & Production:

- **Increase planting density:** We use a rate of 69 seeds/sq ft; growers we've surveyed have used up to 140 seeds/sq ft
- **Use PSNTs to time sidedressing:** Pre-sidedress nitrate tests measure the available nitrate in the soil at the time of sampling. Nitrate moves quickly through soil, and it's not fully known how it behaves in cold high tunnel soil in the winter months when the crop is growing slowly. When nitrate levels drop below 30ppm, it's recommended to sidedress. We sidedress through overhead irrigation, using water-soluble calcium nitrate. PSNTs can be taken monthly to monitor soil nitrate levels. PSNTs are available through the [UMass Soil Lab](#) for \$15 each.
- **Use row cover to speed up growth but not to keep plants alive:** Spinach is very cold sensitive and won't be harmed by cold temps as long as the leaves aren't disturbed while frozen. Row cover may speed up growth slightly but also adds labor, so don't use it to simply keep the plants alive.

## Harvesting & Sales:

- **Harvest by clear cutting:** From what we have seen, winter markets tend to be forgiving of the cut leaves that tend to occur from clear cutting. Clear cutting, either mechanically or by hand, is a huge time/labor saver. We have seen different varieties respond differently to clear cutting as well – some varieties have a growth habit where the developing leaves remain uncut within the growing point. In our trials, Patton, Responder, and Crosstrek all had “uncut” regrowth after being clearcut.
- **Harvest larger than babyleaf:** If your markets will allow it, this is an easy way to increase yields
- **Increase price/lb:** Get a fair price! We've seen people charge anywhere from \$5-14/lb and customers seem willing to pay premium prices for winter greens.