I live and farm at **Twin Oaks Community**, in central Virginia. We’re in zone 7, with an average last frost April 30 and average first frost October 14. Our goal is to feed our intentional community of 100 people with a wide variety of organic produce year round. [www.twinoaks.org](http://www.twinoaks.org)
What’s in this presentation

1. Growing conditions for lettuce
2. Lettuce types – Romaine and bibb head lettuce, leaf lettuce, Batavians, the newer multileaf types and baby lettuce mix.
3. Lettuce varieties for every season
4. Pests and diseases
5. Extending the lettuce season to every month of the year.
   a. Cold weather season extension
   b. Hot weather season extension
6. Scheduling for continuous harvests
7. Resources
• We grow lettuce from transplants
  – outside from February to December, for harvest as heads
  – in a solar-heated greenhouse for leaf harvest November to March
  – in a hoophouse from October to late April for leaf harvest.
• We grow winter baby lettuce mix in our hoophouse
• We have in the past overwintered lettuce
  – with hoops and rowcover outside, and harvested leaves all winter.
  – in coldframes planted in September for heads in November and December, or leaves through the winter until March.
1. Growing conditions - germination

- Lettuce seed needs light to germinate - don’t sow too deep: 1/4"–1/2" (6–10 mm) is ideal.
- Minimum soil temperature for germination is 35°F (1.6°C).
- Optimum temperature range for germination is 68°F–80°F (20°C–27°C).
- Germination takes 15 days at 41°F (5°C), 7 days at 50°F (10°C), 3 days at 68°F (20°C) and only 2 days at 77°F (25°C)
- Germination takes 3 days at 86°F (30°C), but will not occur reliably at temperatures hotter than that.
- Even a few hours at high temperatures can induce dormancy - don’t leave your seeds for even 1 hour in your hoophouse or greenhouse, or on a sunny windowsill.
- New lettuce seed can be harder to germinate, as it has higher levels of the hormone that inhibits germination.
Crop requirements

• Free-draining soil, high organic matter, pH 6.0–7.0.
• Fertile soil with good tilth will help roots grow.
• Don’t overdo the nitrogen – encourages E. coli.
• Keep lettuce growing quickly for good flavor - plenty of water throughout its growth.
• Ideal growing temperatures 60°F–65°F (15°C–18°C).
• Some growth whenever the temperature tops 40°F (4.5°C).
• Cultivate regularly and shallowly to remove weeds. Lettuce roots are near the surface.
Bolting and/or bitterness are more likely with

- Under-watering,
- Long days,
- Mature plants,
- Poor soil,
- Crowding,
- High temperatures,
- Vernalization—once the stems are thicker than 1/4" (6 mm), if plants suffer 2 weeks of temperatures below 50°F (10°C), followed by a rapid warm-up.

Photo Alexis Yamashita
Direct sowing

• Lettuce for mature heads can be direct seeded whenever the weather is suitable.
• Baby lettuce mix is direct seeded, not transplanted.
• For raw seed, sprinkle thinly in a shallow drill.
• Some growers like to use pelleted seed for direct sowing as it is easier to space the seeds.
• Pelleted seed is "primed" ready to grow: it deteriorates fast in storage, so only buy it close to sowing time. Keep the soil damp until the seedlings emerge - the seed coating needs to absorb water and split apart before the seedling can grow.
Advantages of transplanting

• In early spring, get an earlier harvest from transplants than from a direct-sown crop, since the transplants grow indoors while it is still too cold to direct seed.
• In summer, you can start lettuce in a cool place.
• Get ahead of the weeds.
• Allow another crop to mature in the space while transplants are growing, increasing overall yield.
• Transplants are better than seedlings in resisting some pests and fungal diseases.

Bed of young transplanted lettuce. Photo Wren Vile
Sowing for transplanting

• Can sow in cell-packs or plug flats, 3 seeds per cell, later reducing to 1 seedling with scissors.
• Cells with diameters from 1"–2" (2.5–6 cm) can be used.
• If suitable germination space is limited, sow seed in a small flat, then spot the tiny seedlings into bigger flats or 606-cell packs (2" × 2", 5 × 5.6 cm) to grow on before planting out.
• Soil blocks are also possible, but take more time.
Transplanting

- Harden off before transplanting.
- Transplant lettuce seedlings at 4–6 true leaves, 3–6 weeks of age depending on the time of year and how fast they are growing.
- Handle transplants only by their leaves or the root ball—try not to touch the roots or stem.
- 8”–12” (20–30 cm) spacing for full-sized heads. Close spacing lets foliage cover the bed completely, creating a cooler microclimate.
- Accurate spacing saves a lot of time when hoeing, and ensures maximum yield. Use measuring sticks, row-marker rakes, rolling dibbles or transplanting wheels.
- Alternatively, run drip irrigation for 15-20 minutes before planting, and plant into the wet spots.
- Transplant in the late afternoon or evening to minimize evaporation losses.
Watering

• Water new transplants daily for the first 3 days,
• Every 4-7 days after that.
• Lettuce needs a relatively large amount of water throughout its growth.
• Deeper weekly waterings equivalent to 1” (25 mm) of rain are better than frequent superficial irrigation - roots will grow deeper, giving the plant greater drought-resistance.
• In cooler weather, water late morning or early afternoon, to give the leaves time to dry before sunset. This reduces the chance of fungal diseases.
2. Lettuce Types - Butterheads (bibbs)

• Butterheads (bibbs) have soft, sweet, tender leaves
• Shorter shelf-life than romaines and leaf varieties
• Can get tipburn in midwinter
• Can also be used at the baby stage in mixes

Buttercrunch bibb lettuce. Photo Kathleen Slattery
Lettuce Types - Romaines (cos) lettuces

- Romaines (cos) lettuces are upright, usually green, often very crisp and flavorful.
- They have double the vitamin A and vitamin C of other kinds of lettuce.
- Like bibbs, romaines can suffer from tipburn in the winter.
- *Jericho* and *Kalura* have good heat tolerance.
Lettuce Types - Leaf lettuces

- Leaf lettuces include the oak-leaf types, as well as frilly ones that add interesting texture and important “loft” in mixes.
- Leaf lettuces are usually the quickest to produce harvestable sized leaves, and in general they have more heat-tolerance (but not bolt-resistance) than romaines.
- Despite the name, leaf lettuce can also be harvested as whole "heads."

Red Salad Bowl leaf lettuce. Photo Pam Dawling
Lettuce Types - Batavian lettuces

- Batavian lettuces (summer crisp or French crisp) are tasty, thick-leafed varieties that have excellent bolt-resistance as well as heat and cold tolerance.

- Cherokee Batavian lettuce. Photo Pam Dawling
Lettuce Types - Multileaf lettuces

- Familiar *Tango, Panisse, Oscarde* and *Galisse* varieties,
- Newer *Salanova, Multileaf* and *Eazyleaf* brands
- Lobed oakleafs, incised frizzy ones.
- Bred for uniformly small leaves, with more texture, loft and flavor than baby mixes and faster harvesting.
- Transplanted 6"–8" (15-20 cm) apart they produce 40% more than baby leaf mixes.
- Often only sold as pelleted seed.
Multileaf lettuce harvest

- The full-size plant can be harvested as a head
- Or harvested with a single cut, as shown, providing a collection of bite-sized leaves.
- Or just one side (or the outer leaves) of the plant can be cut and the plant will regrow for future harvests.
- Growing multileaf heads takes 55 days, compared to 30 days for baby lettuce.
**Lettuce Types - Baby lettuce mix**

- A direct-sown cut-and-come-again crop, meaning the plants will regrow and can be harvested more than once.
- Weed and thin to 1" (2.5 cm).
- When 3"–4" (7.5–10 cm) tall, cut 1” (2.5 cm) above the soil.
- Gather a small handful in one hand and cut with using large scissors.
- Immediately after harvesting, weed the just-cut area so the next cut won't include weeds.
- We generally buy the ready-made baby lettuce mixes, but for the later sowings, which we will only cut 1-3 times, we sometimes make our own mix.

*Lettuce Mix. Photo Twin Oaks Community*
3. Varieties for every time of year

- Sow several varieties each time—for the attractive harvests, and to spread your risks if one variety bolts or suffers disease.
- I like to sow 4 varieties each time: at least one red, one romaine, and one fast, one slow.
- We have 5 lettuce seasons, with different varieties:
  - Early Spring (Jan – Mar), 6 sowings
  - Spring (April – May 15), 5 sowings
  - Summer (May 15 – Aug 15), 17 sowings (lots of seed!)
  - Fall (Aug 15 – Sept 7), 9 sowings
  - Winter Sept 8 – 27, 9 sowings
- See the handout for our list of varieties for each season.
For early spring lettuce, we look for

- Cold tolerance
- Fast growth
- Diversity of color, texture, leaf shape, days to maturity
- Some of our favorites are Buttercrunch, Bronze Arrow, Green Forest, Merlot, Red Salad Bowl, Revolution, Salad Bowl, Star Fighter, Swordleaf

Revolution leaf lettuce.
Photo Pam Dawling
Varieties for spring
5 sowings, April – May 15

For spring, we look for

- Some cold tolerance, some warmth tolerance (bolt-resistance)
- Diversity of color, texture, leaf shape, days to maturity
- Some early spring varieties still work (Buttercrunch, Green Forest, Nancy, Salad Bowls, Swordleaf)
- Others do not (Bronze Arrow, Merlot, Oscarde, Revolution).
- Some other varieties we like include De Morges Braun, Kalura, Pirat.

Swordleaf lettuce on the right. Photo Bridget Aleshire
Varieties for summer
17 sowings, May 15 – Aug 15

For summer we look for

- Extreme heat tolerance/bolt-resistance.
- Diversity of color, texture, leaf shape, days to maturity as secondary factors.
- Jericho, Kalura are great romaines
- Batavians include Cardinale, Cherokee, Concept, Magenta, Nevada, Pablo, Sierra, and Loma, a smaller, frilly-edged one.
- Anuenue is the only iceberg we grow. Some growers like Ben Shemen and Queensland.
- De Morges Braun and New Red Fire are leaf lettuces for quite hot weather
For fall we look for

- Some warmth-tolerance, some cold tolerance
- Diversity of color, texture, leaf shape, days to maturity.
- Heat-tolerant varieties are also very cold-hardy, but we are tired of Batavians by fall!
- Many spring varieties can be used again in the fall.
- Less hardy varieties until Aug 26
- Then hardy varieties – see winter slide
For winter we look for

- Cold-tolerance above all else
- Diversity of color, texture, leaf shape, days to maturity
- Some bibbs for early winter harvest
- Mostly leaf lettuce to harvest by the individual leaf and leave to regrow.

- Some varieties that do well:
  Buckley, Ezrilla, Green Forest, Hampton, Merlot (Galactic), Oscarde, Panisse, Red Salad Bowl, Red Tinged Winter, Revolution, Rouge d’Hiver, Salad Bowl, Tango, Winter Marvel, Winter Wonderland

- Baby lettuce mixes in late winter and early spring in the hoophouse

Merlot red and Panisse green lettuce in December. Photo Pam Dawling
4. **Pests**

Minimize pests by making good growing conditions, protecting crops with fencing, rowcover, or insect netting and planting flowers that attract beneficial insects.

- **Aphids**: Try a blast of water—most aphids can't travel far. Insecticidal soaps. Ladybugs.
- **Cutworms**: plants get chewed off at soil level.
- **Grasshoppers and crickets**: Bring in praying mantids, or set bait containing the parasitic *nosema locustae*.
- **Groundhogs, rabbits, deer**: Fence or set traps.
- **Slugs**: hunt them at night, or trap in dishes of diluted beer set in the soil.
- **Thrips**: Rowcover and very fine mesh nets can keep them away.

![Proteknet insect netting. Photo Wren Vile](image)
4. Diseases

- **Damping off**: affects young seedlings in cold wet grey conditions. Minimize watering in chilly weather, provide good airflow, foliar feed with seaweed spray or compost tea.

- **Tip burn**: A physiological disorder, not a disease. It follows a sudden change to warmer breezy weather. When the transpiration rate is much higher than the rate of water uptake, the outer edges of the inner leaves don't get enough water, so they brown and die. Reduce transpiration by shading, and/or protecting from the wind. If tip burn seems to be a frequent problem, choose resistant varieties, and avoid bibbs, which are more prone to tip burn.

Nancy bibb lettuce with slight tipburn. Photo Bridget Aleshire
4. More Diseases

- **Bottom rot**: soil-borne cool-season problem caused by *Rhizoctinia* fungus. Shows initially as slightly sunken rust-colored spots, possibly with amber ooze. The whole plant can dissolve into black slime. Solarization works well.

  **Sclerotinia**: Lettuce drop fungus. Attacks lower leaves at soil level and produces a cottony growth. The whole plant then collapses into a flat limp pancake. It can be a serious problem in hoophouses where lots of lettuce is grown. Solarize for two summer months every four years.

Hampton Eazileaf lettuce with Sclerotinia in our hoophouse in January. Photo Pam Dawling
5. Extending the lettuce season

Provide lettuce harvests all year.

- **Season extension techniques for cold weather** -
  Growing earlier crops in spring, later crops in the fall, crops in the winter (cold-hardy varieties)

- **Season extension options for hot weather** – getting lettuce seed germinated, growing non-bitter lettuce, keeping pests off.

For details, see my slide shows:

- *Year Round Vegetable Production,*
- *Hoophouse in Spring and Summer,*
- *Hoophouse in Fall and Winter*
- *Fall Vegetable Production,*
- *Cold-Hardy Winter Vegetables* on SlideShare.net
Cold-hardiness of lettuce

- Lettuce is a lot more cold-hardy than most people realize.
- Immature plants are more cold-tolerant than mature plants.
- Baby leaf lettuce is more cold tolerant than full-sized heads.
- Outdoors with good rowcover, lettuce may survive a dip to 10°F (-12°C) — but not 8°F (-13°C).
- Our double plastic hoophouse keeps night temperatures 7–10°F (4–6°C) degrees warmer than outdoors.
- Plants tolerate lower temperatures in a hoophouse than outside.
- Inside, plants can survive (without any inner rowcovers) 14°F (8°C) degrees colder than they can outside.
- With the addition of thick 1.25 oz (42 gm) rowcover, hoophouse crops can survive 21°F (12°C) degrees colder than they can outside.
- When outdoor temperatures were 14°F (-10°C) our lettuce survived a hoophouse temperature of 10.4°F (-12°C) without any rowcover.
- When it dropped to -12°F (-24°C) outdoors, rowcovered hoophouse lettuce survived a hoophouse temperature of -2.2°F (-19°C).
Cold Weather Crop Protection

1. Rowcover

• Keep crops alive and productive beyond their normal winter-kill temperatures.
• Better quality produce – reduced weather and pest damage
• Lightweight, easy to use and store.
• Hold down edges with bags of rocks or sand, jugs of water, or metal or wooden stakes lying on the edges.

Photo Wren Vile
Rowcover

- To protect against cold, you need **thick** rowcover
- Dupont Xavan 5131 (aka Typar). **1.25 oz/sq yd** spunbonded polypropylene; 75% light transmission; about **6 F (3.3 C) degrees of frost protection**; can last for 6 years or more.
- Agribon 17 (or 19) **0.55 oz/sq yd** spun-bonded polypropylene; transmits 85% of light; offers **4F (2.2C) degrees of frost protection**
- Thinner types are to protect from insects. Two layers of thinner rowcover may work better than one thick layer in protecting against the cold.

- Hoops keep rowcover from sticking to frozen leaves and reduce abrasion.
- 9- or 10-gauge wire.
- In winter we use double wire hoops

We think polypropylene rowcover lasts longer and is tougher than polyester (Reemay)
Cold Weather Crop Protection

2. Quickhoops

- Cover more than one bed, close to the ground.
- Popularized by Eliot Coleman in Maine.
- Can be covered with rowcover topped by hoophouse plastic for the winter.
- Best for areas with reliably cold winters, not back-and-forth winters that include spells too mild to keep crops under polyethylene.

Photo Johnnys Seeds
3. Caterpillar Tunnels

- Usually tall enough to walk in
- Sometimes narrower than Quickhoops. 2 beds + 1 path
- Plastic or rowcover held down by ropes at each hoop.
- Can be used for summer or winter.
- No sandbags.

Photo MOFGA
Coldframes & unheated greenhouses

- Coldframes are traditionally made from blocks, boards or straw bales, with discarded windows over the top.
- They are very useful on a small scale, but labor-intensive.
- For large-scale production, the construction costs of a hoophouse are lower than for the same area of coldframes.
- Single-layer hoophouses are sometimes called coldframes.
- Unheated greenhouses with a masonry north wall will also grow lettuces all winter (in central Virginia at least).
- Coldframe and greenhouse. Photo Kathryn Simmons
Cold Weather Crop Protection
5. Hoophouses (High Tunnels)

- Hoophouses are incredibly productive
- One or two layers of plastic (I recommend two)
- Double-layer houses use a small electric blower to inflate the gap. Solawrap is an option if you don’t have electricity.
- Crops grow in the ground, often with drip irrigation
- Crop quality, especially leafy greens, is superb.
- Working in winter inside a hoophouse is much more pleasant than dealing with frozen rowcover and hoops outdoors.
Winter hoophouses

- A double-layer house provides about 8F (4.5C) degrees of night-time temperature difference
- Solar heating is sufficient to grow a wide range of cold-tolerant crops.
- Cold-weather crops grow much much faster inside
- Crops continue to grow throughout the winter in our climate whenever temperatures are warm enough.
- Rowcovers can be used inside for extra cold protection

For details, see my slide show *Hoophouse in Fall and Winter* on SlideShare.net

Hoophouse December view. Photo Kathleen Slattery
Hoophouses for winter lettuce

- Growing winter salads is easy and efficient.
- Salad greens in a hoophouse can freeze every night and thaw every morning without damage.
- The soil temperature stays warmer than outdoors.
- Lettuces can tolerate cold nights when they have the relief of warm 80°F–85°F (27°C–29°C) days.
- For harvest from October to April we grow both leaf lettuce and baby lettuce mix in our hoophouse.
- We transplant leaf lettuce in October and November, sow baby lettuce mix between October 24 and Feb 15

Red Tinged Winter and Tango lettuce in December. Photo Wren Vile
6. Heated Greenhouses

- Greenhouses are great places to start your own transplants – especially with a heated area for germinating seedlings.
- But the cost of heating for growing crops to maturity may not be worthwhile. You can buy several hoophouses for the price of one greenhouse and heating.
- Heat is only one aspect of growing plants – day-length and sunlight intensity are also important.
- Aphids and whiteflies can quickly become problems in heated spaces.
Season extension options for hot weather

- Use only the most heat-tolerant varieties - others may not germinate at high temperatures and the plants will bolt and taste bitter.
- **Store seeds** in a very cool dry and dark place.
- **Use tricks to germinate** the seeds.
- Use younger and smaller transplants than in spring.
- **Transplant in the evening.**
- Use closer spacings.
- Plant to the north of tall plants.
- **Use shadecloth**
- **Use netting** to keep bugs off.

[Photo Alexis Yamashita]
Start seeds indoors

• Put the seeded flats in a plastic bag in the fridge, or set the flat on a cool basement floor for 2 days to break the dormancy

• Use plug flats or soil blocks rather than open flats, to reduce transplant shock.

Lettuce transplants in soil blocks.  
Photo Pam Dawling
Sowing outdoors when it’s hot

- Soil temperature must be lower than 80°F (27°C) - use a soil thermometer.
- Consult my book *The Year-Round Hoophouse*, Nancy Bubel’s *New Seed Starter’s Handbook* or *Knott’s Vegetable Grower’s Handbook*, on the number of days to emergence at various temperatures.
- If soil temperatures are too high for good germination, prepare a small nursery bed for your seedlings and transplant later.
- Cool the soil for several days ahead, by watering and covering with thick organic mulch, boards or burlap.
- Sow in sunken furrows, as you don’t want the seeds to dry out.

Lettuce nursery seedbed.
Start seeds outdoors

- Sow in the evening.
- After sowing (thickly), put ice on top of the soil covering the seeds.
- Cover with shadecloth (50 percent shade is ideal), or tent screen windows, nylon window screen or nylon net curtains. Use something air can flow through, to prevent overheating.
- Water with freshly drawn cool water at midday (possibly more than once a day) until the seed germinates.
Transplanting in hot weather

- **Use younger and smaller transplants** (3 weeks old) than you would in spring—they will recover more quickly than larger ones.

- **Transplant in the evening**. Develop a fast technique so that you can get your crop planted and watered in the last hour before sunset.

- **Closer spacings** such as 10"–12" (25–30 cm) will help foliage to grow to completely cover the bed and keep a cooler microclimate.

- **Use shadecloth** for at least the first two weeks after transplanting.

Anuenue and a red Batavian lettuce under shadecloth.

Photo Bridget Aleshire
Growing lettuce in hot weather

- **Water much more** in hot weather — bitterness before bolting is almost always a sign of water stress. Just one day of insufficient soil moisture can trigger bitterness in lettuce.

- If you have mature heads that you want to hold for a couple more days, use overhead watering early in the morning.

- For some crops, organic mulches can help cool the soil. **But** they do not work well for lettuce, as stray wisps of mulch mix with the harvested crop.
We use ProtekNet insect netting on wire hoops. It offers better light, air and rain transmission than rowcover. Overly thick rowcover or rowcover resting directly on the plants can make the seedlings more likely to die of fungal diseases in hot weather — good airflow is vital. Dubois, Purple Tools and Johnny’s sell in 100 m or 250 m rolls.

Photos Dubois Agrinovation (upper), Bridget Aleshire (lower)
6. Scheduling for continuous harvests

• Lettuce grows faster at some times of year than others, and the time between one sowing and the next needs to vary to balance this.

• To harvest a new planting every week you need to have sowing gaps of more than 7 days in the spring, 6-7 days in the summer, less in fall.

• In warm spring weather, baby heads of lettuce or individual leaves can be ready to harvest 4 weeks after transplanting, and full-sized heads 6 weeks after transplanting.

• In summer, full size heads can be ready in as little as 3 weeks from transplanting.

• In the fall, as temperatures and day-length decrease, the time to maturity lengthens, and a single day's difference in sowing date can lead to almost a week's difference in harvest date.

• Lettuce for February harvest will take 2-3 times as long from planting as that for September harvest.

• December and January sowings grow very slowly, and early February sowings will almost catch up.
### Scheduling lettuce January to March

**January:**
- **Sow** every 2 weeks indoors in flats in late January for outdoor transplants
- If you have a greenhouse or hoophouse, transplant there until mid-February
- **Harvest indoor** leaf lettuce and baby lettuce mix

**February:**
- Same as January

**March:**
- **Sow** indoors in flats every 10 days
- From late March or early April, you could switch to outdoor **direct sowing**. (We transplant all our lettuce.)
- **Transplant** the first 3 sowings outdoors with rowcover
- **Harvest** leaf lettuce, baby lettuce mix from a hoophouse; starting late March, harvest leaves from the first outdoor planting

See later for **hoophouse lettuce** scheduling January- April
Scheduling lettuce April to June

April:

• Sow every 9 days.
• Transplant the March sowings.
• Harvest whole heads from late April

May:

• Sow every 8 days.
• Transplant 1 week’s needs each week.
• Harvest outdoor heads

June:

• Sow every 6 days, under shadecloth
• Transplant one week’s needs every 6 days, using shadecloth for the first 2 weeks
• Harvest outdoor heads
Scheduling lettuce in July and August

July:
- **Sow** very heat-resistant varieties, every 5 days, in the evening, under shadecloth.
- **Transplant** one week’s needs every 6 days, covering with shadecloth for the first 2 weeks.
- **Harvest** outdoor heads

August:
- **Sow** every 5 days early in the month; every 3 days later in the month.
- Mid-August is our last date for outdoor direct seeding (80 days before first hard freeze).
- **Transplant** one week’s needs every 5-6 days outdoors, with shadecloth.
- In late August/early Sept, could **transplant** into coldframes
- **Harvest** outdoor heads

Pablo lettuce under shadecloth. Photo Nina Gentle
Scheduling lettuce in September

- If you have somewhere to plant them, **Sow** cold-hardy varieties every 2 days until Sept 21, then every 3 days.
- **September sowings** will be only for coldframes, hoophouses, greenhouses, or –
- Or to **overwinter lettuce outdoors** with hoops and rowcover. Aim to have plants half-grown by the time the very cold weather hits. Try a few different **sowing dates**, as the weather isn’t very predictable. For us, **Sept 10–18** are the best dates.
- **Transplant** one week’s needs outdoors every 5 or 6 days until Sept 21 (August sowings).
- **Harvest** outdoor heads.

Cold-hardy (not heat-tolerant) Tango lettuce Photo Kathryn Simmons
Scheduling lettuce October to November

October:
• For a greenhouse or hoophouse, maybe sow every 3–7 days until Oct 15, then every 7 days until Oct 31. Sow hoophouse gap fillers 10/23.
• In late October, direct-sow the first baby lettuce mix in a hoophouse.
• Transplant September sowings into a hoophouse or greenhouse at 4 weeks old to harvest as leaves from mid-November to early March.
• Harvest outdoor heads

November:
• Harvest the last outdoor heads, & leaves of indoor lettuce.

Lettuce in our unheated greenhouse in November. Photo Wren Vile
December:

- At the end of December, sow a second round of baby lettuce mix, for harvest from late February to the end of March.
- Perhaps make a sowing between Dec 1–15 to transplant in a greenhouse in January.
- Transplant at the end of December for heads in February (or leaves in January and February).
- Harvest leaves from the indoor lettuce and start cutting the first baby lettuce mix.
January: Harvest leaves from the transplanted lettuce, cut the 1<sup>st</sup> baby lettuce mix whenever it reaches the right size.

February: Sow the 3<sup>rd</sup> baby lettuce mix February 1, for up to 3 cuts from mid-March to late April. In mid-February, consider a 4<sup>th</sup> sowing of baby lettuce mix, especially if outdoor conditions look likely to delay outdoor harvests. Harvest leaves from the transplanted lettuce, as well as the 1<sup>st</sup> baby lettuce mix, clearing it at the end of February before it gets bitter. Cut the 2<sup>nd</sup> baby lettuce mix when it sizes up.
Hoophouse lettuce Mar-April

March: Harvest leaves from the transplanted lettuce. Cut the 2\textsuperscript{nd} and 3\textsuperscript{rd} baby lettuce mix whenever they reach size.

April: Harvest the last of the transplanted lettuce as heads in the first half of the month. Clear the 2\textsuperscript{nd} baby lettuce mix and continue to cut the 3\textsuperscript{rd} and 4\textsuperscript{th} mixes until they get bitter. Our outdoor lettuce heads are usually ready to take over crop production in late April.
Lettuce logbook – see handout

- Record planned and actual dates of sowing, transplanting, starting and finishing harvest of each planting, for head lettuce from transplants.

These exact dates probably won’t be right for your farm, but you can see the general themes.

- Improve the sequence every year and get closer to your goal of a continuous supply.

The gap between one sowing and the next gets smaller as the year progresses; the gap between one transplanting and the next does likewise;

The number of days to reach transplant size dips to 21 days in the summer, then lengthens as the weather cools and the days get shorter.
“No Paperwork” succession method

• January to June: Sow more lettuce when the previous sowing germinates
• As the conditions get warmer in spring, lettuce seed germinates faster, nudging you to sow at a shorter interval.
• In hot weather, this is not a reliable method – just sow every 6 days.

Tiny lettuce seedlings. Photo Pam Dawling
Succession planting

A sequence of planting dates to provide an unbroken regular supply.

We recorded sowing and harvest dates for several years, then plotted our data on a graph.

We used the graph to determine a sequence of sowing dates likely to provide a regular daily harvest.

For details of this method see Succession Planting on SlideShare.net

Young Sierra lettuce on 4 July.
Photo Pam Dawling
Make a Graph - 6 Steps

1. Gather sowing and harvest start and finish dates for each planting

2. Make a graph: sowing date along the horizontal (x) axis; harvest start date along the vertical (y) axis. Mark in all your data. Join with a line.

3. Mark the first possible sowing date and the harvest start date for that.

4. Decide the last worthwhile harvest start date, mark that.

5. Then divide the harvest period into a whole number of equal segments, according to how often you want a new patch.

6. Use the graph curve to see the sowing dates needed to match your harvest start dates.

Young Salad Bowl lettuce.
Photo Bridget Aleshire
Lettuce successions Graph – see handout


● *The Four Season Harvest*, Eliot Coleman, 1999, Chelsea Green


● Extending the Season: Six Strategies for Improving Cash Flow Year-Round on the Market Farm, a free e-book download for online subscribers to Growing for Market magazine
Resources – more books

Resources - Online

- North Carolina State Extension, Lettuce: [https://content.ces.ncsu.edu/lettuce](https://content.ces.ncsu.edu/lettuce)
- *How to Have Fresh Lettuce Year-Round, Without a Greenhouse or a Cold Frame (Zone 5a)*, Tom Clothier, [http://tomclothier.hort.net/page23.html](http://tomclothier.hort.net/page23.html)
- SARE [www.sare.org](http://www.sare.org) A searchable database of research findings: *Season Extension Topic Room*
THE YEAR-ROUND
HOOPHOUSE

POLYTUNNELS
FOR ALL SEASONS AND ALL CLIMATES
Lettuce Year Round

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