Lessons in Summer Lettuce Production



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Middle Way Farm

Grinnell, IA

Middle Way Farm

- Started in 2013; farming full time since 2016. 2020 will be 8th growing season. Several years of prior experience working at Grinnell Heritage Farm
- Chemical-free, not yet certified organic
- Live in town, farm on 4 acres of leased land just outside of town. 2 acres in vegetable production plus 30 x 26 transplant greenhouse and 96 x 30 high tunnel
- 75-100 member CSA (with fully customizable option), one weekly farmers market, several bimonthly/monthly consumer coops, a few wholesale customers.

Marketing Lettuce

- **Lettuce mix** - $4 for 5 oz. bag retail ($12.50/lb) or 2 for $7. $3 for 5 oz. clamshells wholesale. $6-7 per lb. bulk.

–Salanova varieties

–Allstar Mix from Johnnys Seeds (fall only)

- **Salad/mesclun mix**

–Lettuce mix plus arugula, baby kale, and/or spinach to stretch mix

- **Head Lettuce** - $2 for mini-heads or 3 for $5

–Salanova varieties, especially red & green butter

–Little Gems – Mini-romaine/butter

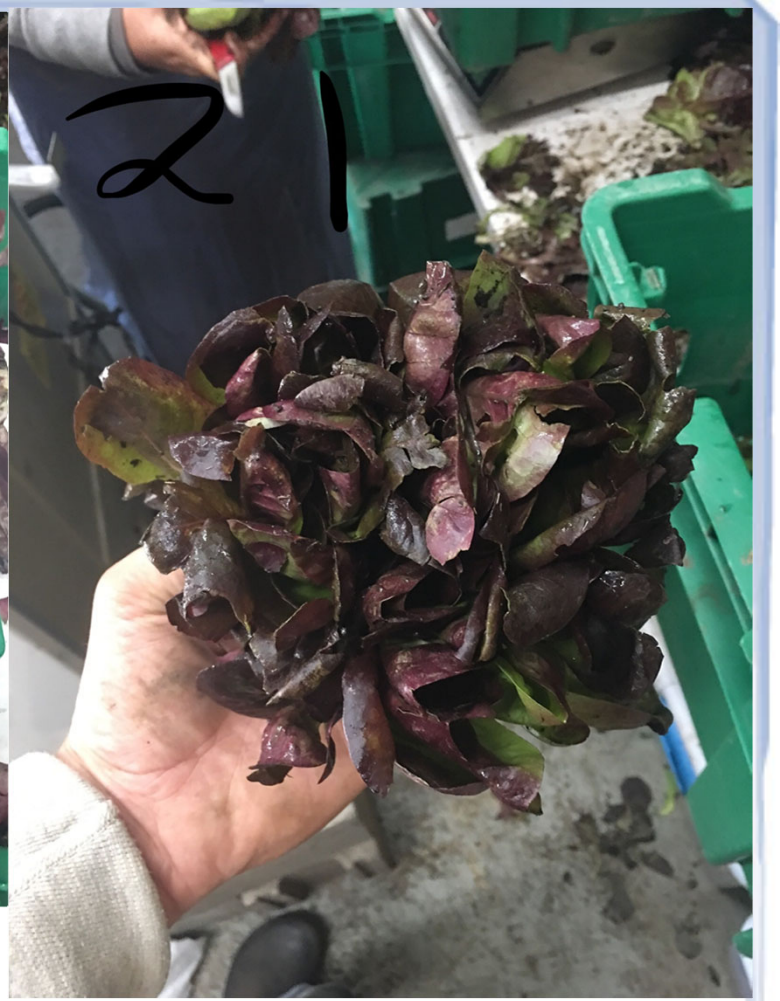

Special on
lettuce mix
2 for $7.00
2 for $5.00 for
head
lettuce
Middle
Way
Farm
Locally Grown
Grinnell, Iowa
NO pesticides,
herbicides,
or synthetic
fertilizers
Salad Mix
Baby lettuce greens
$4.00 /5 oz
or
2 for $5.00


Middle Way Farm
Lettuce Mix
5 oz.
Double Washed
Locally Grown
Chemical-Free
Grinnell, Iowa
middlewayfarm.com


Middle Way Farm
Lettuce Mix 5 oz.
Spinach 5 oz.
Locally Grown • Chemical-Free
Grinnell, Iowa
middlewayfarm.com
Locally Grown Middle Way Farm Lettuce mix & Spinach
4.99
5oz
CLASSIC COLESLAW
ITALIAN BLEND
VEGGIE BACON STRIPS

2019 Red Lettuce Trial

- **Question:** What are the best one-cut red lettuces for yield and quality?
- **Hypothesis:** Salanovas will outcompete Eazyleaf varieties
- **Varieties:** Three Salanova types (Red Butter, Red Sweet, Red Oakleaf), Three Eazyleaf Types (Stanford, Buckley, Brentwood)
- **Three successions:** Spring, Summer, Fall
- **Measured:** Head count, Yield (lb.), Tip Burn, Bolting, Bottom Rot, Flavor, Brix



Brentwood

Buckley

Stanford

Eazyleaf Lettuces

Red Sweet

Red Oakleaf

Red Butter

Salanova Lettuces

Results...

Keys to Summer Lettuce Production

1) VARIETY SELECTION
2) Succession Planting
3) Transplant Production
4) Shade cloth
5) Irrigation
6) Fertility
7) Post-harvest handling

Keys to Summer Lettuce Production

1) VARIETY SELECTION

Variety Selection

- THE MOST important factor for successful summer production
- MUST be bolt tolerant / heat resistant for spring OR summer production in Iowa
- Lettuce Trial Winners (2017-2018):

–Muir, Magenta (2017), Nevada (2018)

- Middle Way Farm Favorites:

–Salanova – Green Sweet (most productive), Butter types, Oakleaf types

–Muir, Tropicana, Little Gems

Keys to Summer Lettuce Production

1) VARIETY SELECTION

2) **Succession Planting for Continuous Harvest**

Succession Planting for Continuous Harvest

- Don't expect recuts on summer lettuce
- Closer planting intervals as season goes on
  - Spring = 2-3 weeks, summer = 1 week, fall = every few days
- Plan out calendar of seeding, transplant, and anticipated harvest BEFORE season starts
- Weekly greenhouse, soil prep, and planting routine
- Don't cut too early

Keys to Summer Lettuce Production

1) VARIETY SELECTION
2) Succession Planting for Continuous Harvest
3) **Transplant Production**

Transplant Production

- Need a place that is not too hot for germinating seeds and growing healthy transplants during hottest months
  - Shade cloth, ventilation, fans in greenhouse
  - Indoor grow light set-up
  - Germination chamber
- Keeping up with transplant schedule during busy harvest season
  - Weekly routine
  - Delegation
- Pay attention to greenhouse pest issues during summer months


INKBIRD
90.1
99.0
SET
INKBIRD
INKBIRD
72.1
75.0
SET

Keys to Summer Lettuce Production

1) VARIETY SELECTION
2) Succession Planting for Continuous Harvest
3) Transplant Production
4) **Shade cloth**

Shade Cloth

- 30% shade suspended with hoops over top of lettuce right after transplanting
- Start in early June, stop at end of August.
- Remove shade cloth 7-10 days after transplanting/germination or else lettuce will get leggy

Keys to Summer Lettuce Production

1) VARIETY SELECTION
2) Succession Planting for Continuous Harvest
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4) Shade cloth
5) **Irrigation**

Irrigation

- MUST have irrigation available for lettuce in summer – cannot rely on rainfall
- **Drip irrigation** – most efficient use of water but no evaporative cooling
- **Overhead irrigation** – can run every few hours on timers during hot days to evaporatively cool lettuce on hottest days
- Water is critical at transplant time and throughout growth period

Keys to Summer Lettuce Production

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5) Irrigation
6) **Fertility**

Fertility

- Adequate nutrients needed for yield, pest/disease resistance, and flavor/nutrition – NPK, but also micro-nutrients
- Summer lettuce can often be a second or even third crop so pay attention to amending between crops
- Soil tests, visual observations, plant sap/tissue testing to determine what is lacking
- Nitrogen availability is determined by soil mineralization rate from organic matter, which is highly dependent on microbial activity

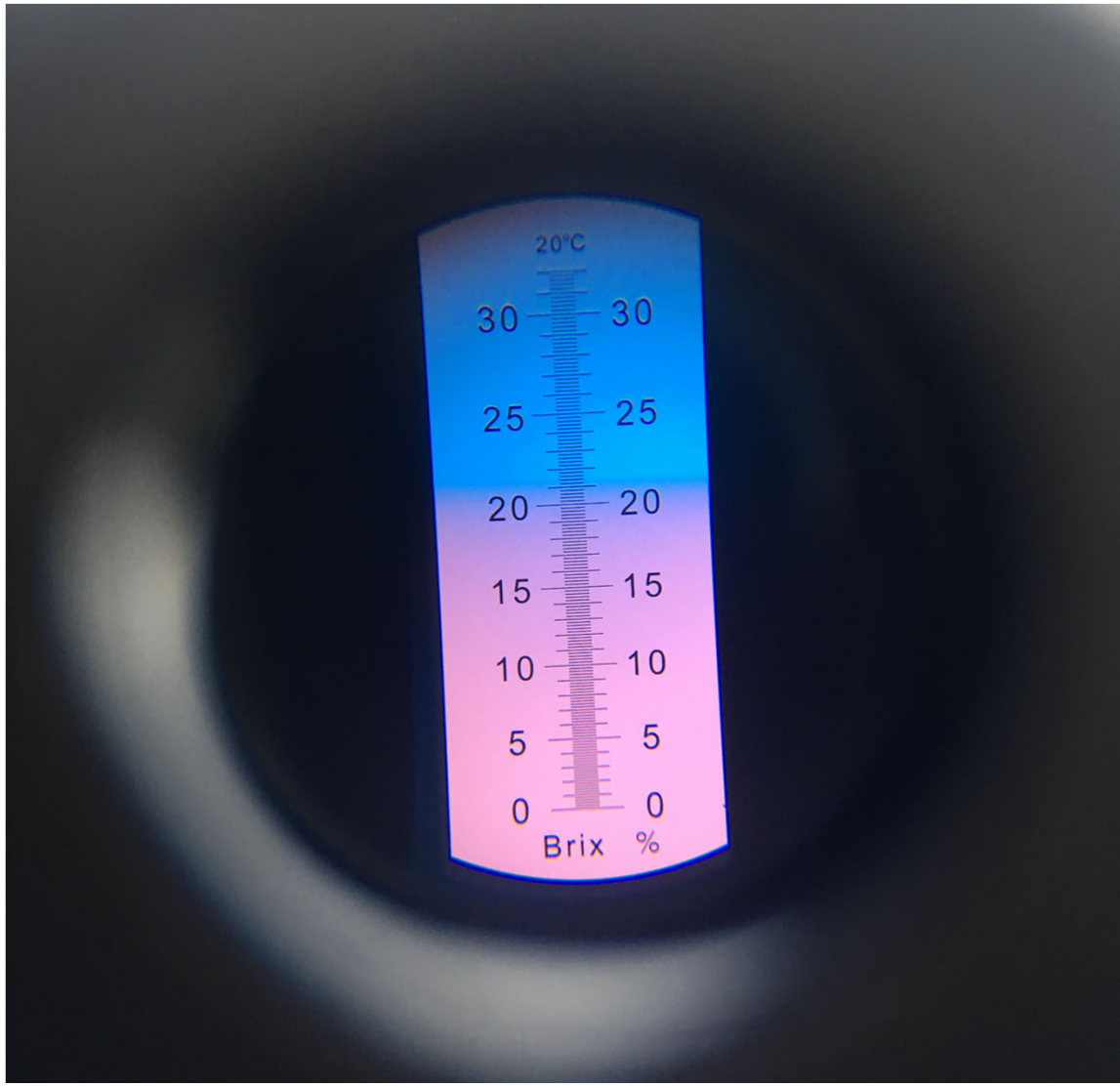
Element	Symbol	Classification	Chemical Form Taken into the Plant
Hydrogen	H	Nonmineral nutrient	H_2O
Oxygen	O	Nonmineral nutrient	O_2 and CO_2
Carbon	C	Nonmineral nutrient	CO_2
Nitrogen	N	Macronutrient	NH_4^+ and NO_3^-
Phosphorus	P	Macronutrient	$H_2PO_4^-$ and $H_2PO_4^{2-}$
Potassium	K	Macronutrient	K^+
Calcium	Ca	Secondary element	Ca^{2+}
Magnesium	Mg	Secondary element	Mg^{2+}
Sulfur	S	Secondary element	SO_4^{2-}
Boron	B	Micronutrient	$B(OH)_3$
Chlorine	Cl	Micronutrient	Cl^-
Copper	Cu	Micronutrient	Cu^{2+}
Iron	Fe	Micronutrient	Fe^{2+} and Fe^{3+}
Manganese	Mn	Micronutrient	Mn^{2+}
Molybdenum	Mo	Micronutrient	MoO_4^{2-}
Nickel	Ni	Micronutrient	Ni^{2+}
Zinc	Zn	Micronutrient	Zn^{2+}

Micronutrients are required throughout the growth cycle

Micronutrients essential to support growth processes

Fe, Zn, Mn	Fe, Zn, Mn, Cu, B	Fe, B	Cu, Mo, B


ATC


20°C
30
25
20
15
10
5
0
Brix
%

Refractive Index of Crop Juices -- Calibrated In % Sucrose Or ºBrix

	Poor	Average	Good	Excellent
FRUITS				
Apples	6	10	14	18
Avocados	4	6	8	10
Bananas	8	10	12	14
Blueberries	8	12	14	18
Cantaloupe	8	12	14	16
Casaba	8	10	12	14
Cherries	6	8	14	16
Coconut	8	10	12	14
Grapes	8	12	16	20
Grapefruit	6	10	14	18
Honeydew	8	10	12	14
Kumquat	4	6	8	10
Lemons	4	6	8	12
Limes	4	6	10	12
Mangos	4	6	10	14
Oranges	6	10	16	20
Papayas	6	10	18	22
Peaches	6	10	14	18
Pears	6	10	12	14
Pineapple	12	14	20	22
Raisins	60	70	75	80
Raspberries	6	8	12	14
Strawberries	6	8	12	14
Tomatoes	4	6	8	12
Watermelons	8	12	14	16
GRASSES				
Alfalfa	4	8	16	22
Grains	6	10	14	18
Sorghum	6	10	22	30

	Poor	Average	Good	Excellent
VEGETABLES				
Asparagus	2	4	6	8
Beets	6	8	10	12
Bell Peppers	4	6	8	12
Broccoli	6	8	10	12
Cabbage	6	8	10	12
Carrots	4	6	12	18
Cauliflower	4	6	8	10
Celery	4	6	10	12
Corn Stalks	4	8	14	20
Corn (Young)	6	10	18	24
Cow Peas	4	6	10	12
Cucumbers	4	6	8	12
Endives	4	6	8	10
English Peas	8	10	12	14
Escarole	4	6	8	10
Field Peas	4	6	10	12
Garlic, Cured	28	32	36	40
Green Beans	4	6	8	10
Hot Peppers	4	6	8	10
Kale	8	10	12	16
Kohlrabi	6	8	10	12
Lettuce	4	6	8	10
Onions	4	6	8	10
Parsley	4	6	8	10
Peanuts	4	6	8	10
Potatoes	3	5	7	8
Potatoes, Sweet	6	8	10	14
Romaine	4	6	8	10
Rutabagas	4	6	10	12
Squash	6	8	12	14
Sweet Corn	6	10	18	24
Turnips	4	6	8	10

Within a given species of plant, the crop with the higher refractive index will have a higher sugar content, higher mineral content, higher protein content and a greater specific gravity or density. This adds up to a sweeter tasting, more minerally nutritious food with lower nitrate and water content, lower freezing point, and better storage attributes.

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4) Shade cloth
5) Irrigation
6) Fertility
7) **Post-harvest handling**

Post Harvest Handling

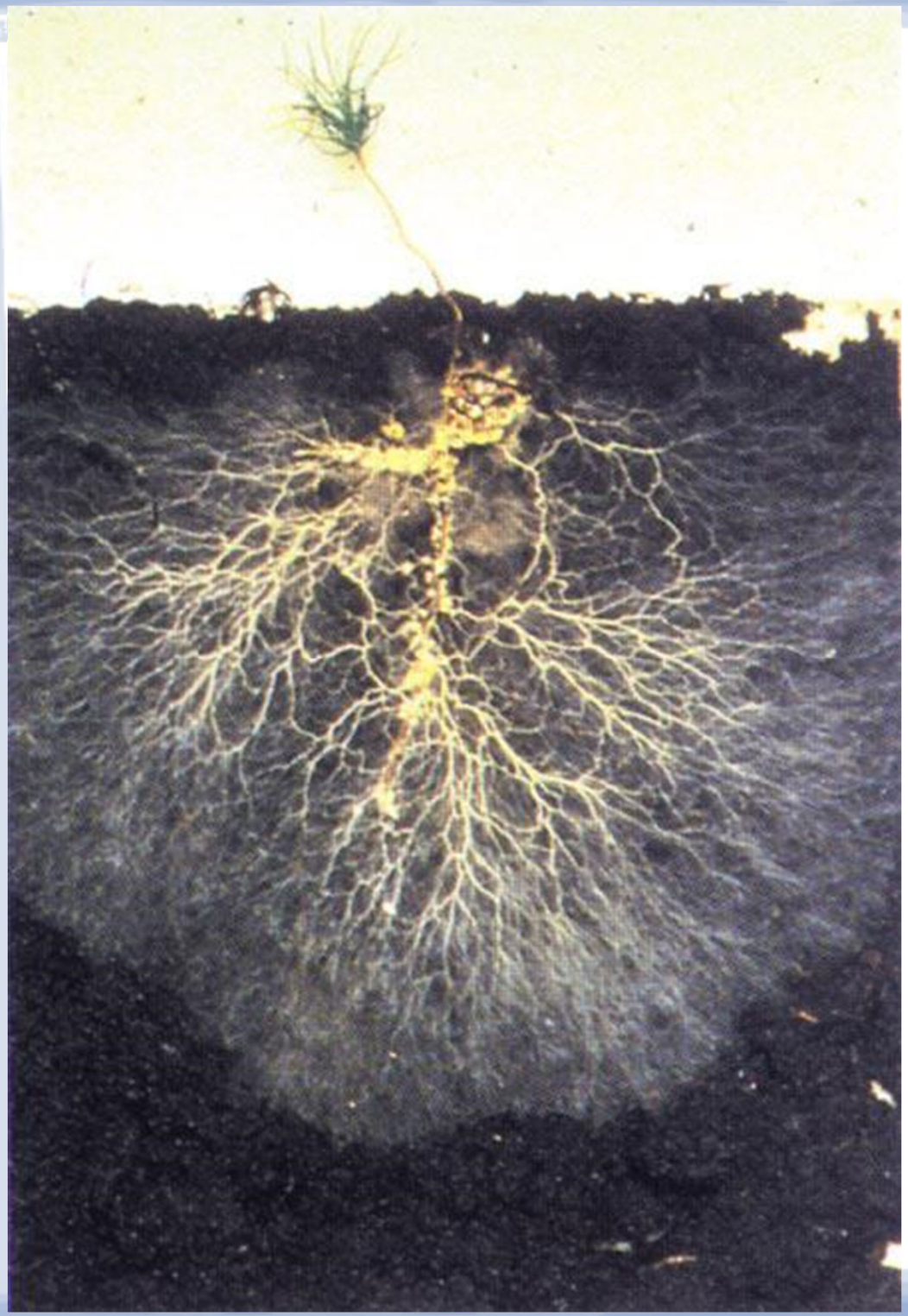
- Early morning harvest before heat of the day is critical
- Dunk and wash or mist with cold water as soon as possible after harvest
- Put into a 32-40 degree cold space
  - Ideal storage conditions = 32 degrees, 95% humidity
- Use plastic bags or sealed totes to keep lettuce from wilting in the cooler
  - Leave open at first when wet to allow more rapid cool down, then seal a few hours later
- NOTE: Whole heads of Salanova, if properly handled, can keep for weeks in a cooler

Problems in Summer Lettuce Production

- Dampening off in seedlings
- Bolting, bitterness (spit test)
- Stunting/slow growth
- Tip burn
- Bottom rot
- Caterpillars, cucumber beetles

Resources

- Ray Tyler, Rose Creek Farm – Year-round lettuce production in hot, humid Tennessee
  - Lettuce Masterclass – paid self paced online course
- Free Facebook groups – Market Gardening Success Group, Growing Year Round Lettuce in Challenging Environments
- Small Farm University



Mycorrhizal fungi

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