

Growing Artichokes in New England

Peyton Ginakes, peyton.ginakes@maine.edu

Mark Hutton

David Handley

University of Maine Cooperative Extension

New England Vegetable & Fruit Conference

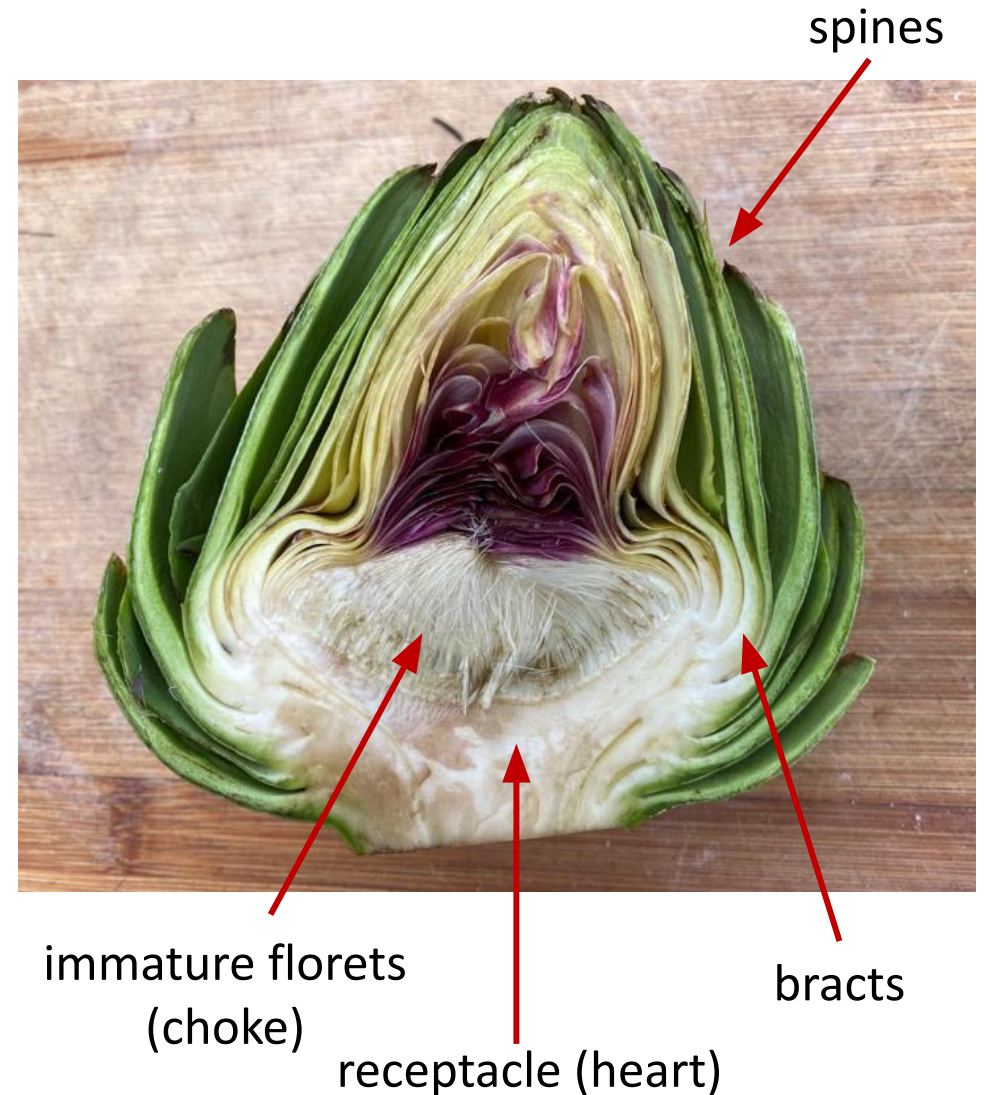
December 19, 2024

Manchester, NH

Globe artichoke

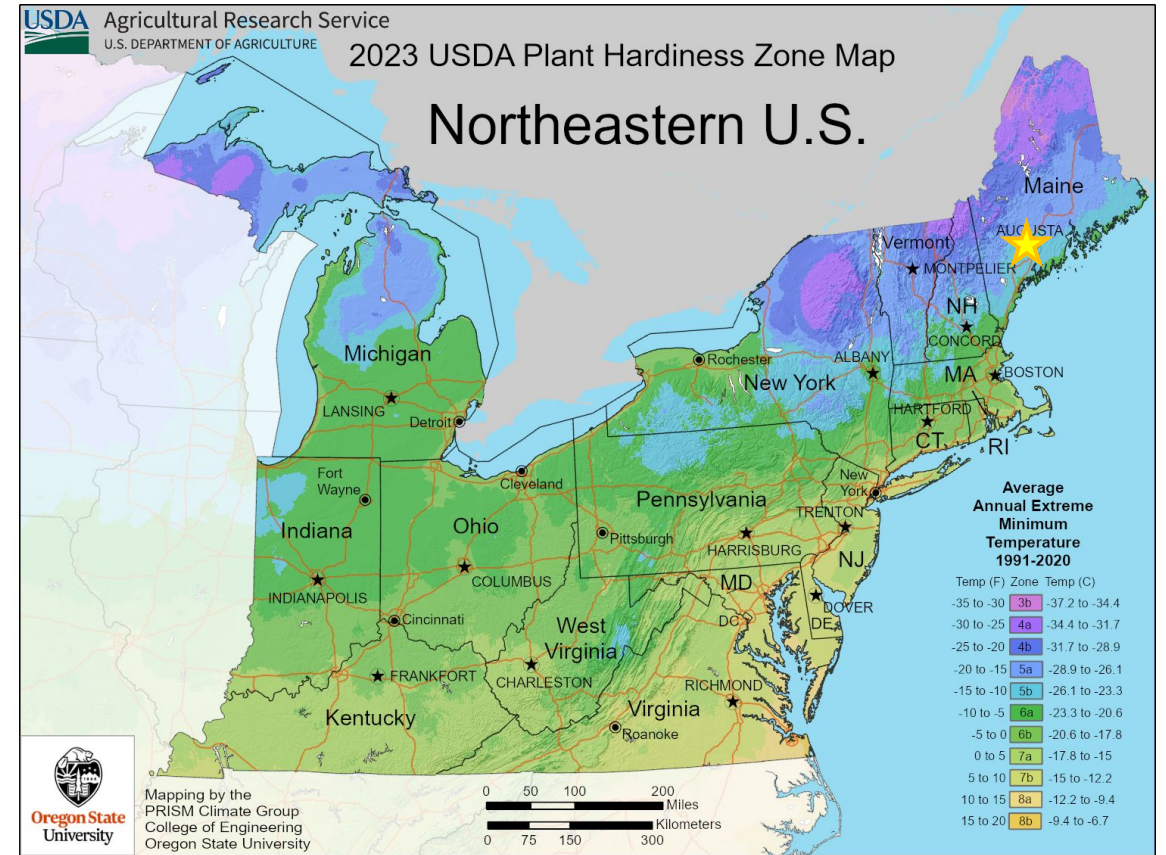
Cynara cardunculus var. *scolymus*

- Asteraceae family (sunflower, lettuce, chicories, thistle)
- Immature flower bud is the harvested portion
- Commonly 10-20 buds/plant*, but occasionally 20+
 - * Only 1-3 buds per plant (“primaries”) will be of an individually marketable size



General culture

- Originated in Mediterranean, and global production is still concentrated in Italy
- In US, production is heavily concentrated in Monterey County of CA
- Perennial in zones 7+
- When grown as an annual, **vernalization is required**
- Despite being cooler than Mediterranean environments, New England growing conditions are very stressful for artichoke
- Our trials took place in Maine, zone 5b



Vernalization

- Vernalization is the process of subjecting plants to cold temperatures to trigger flowering
- Chill units accrue naturally over winter where grown perennially
- Transplanting early in spring may also allow plants to accrue adequate chill units
- Alternatively, seedlings can be placed in cold controlled environments
- Most commercial varieties do not have known chill requirements
- *Previous* recommendation: 10 days at 45-50°F



Overview



1) Vernalization



2) Varieties



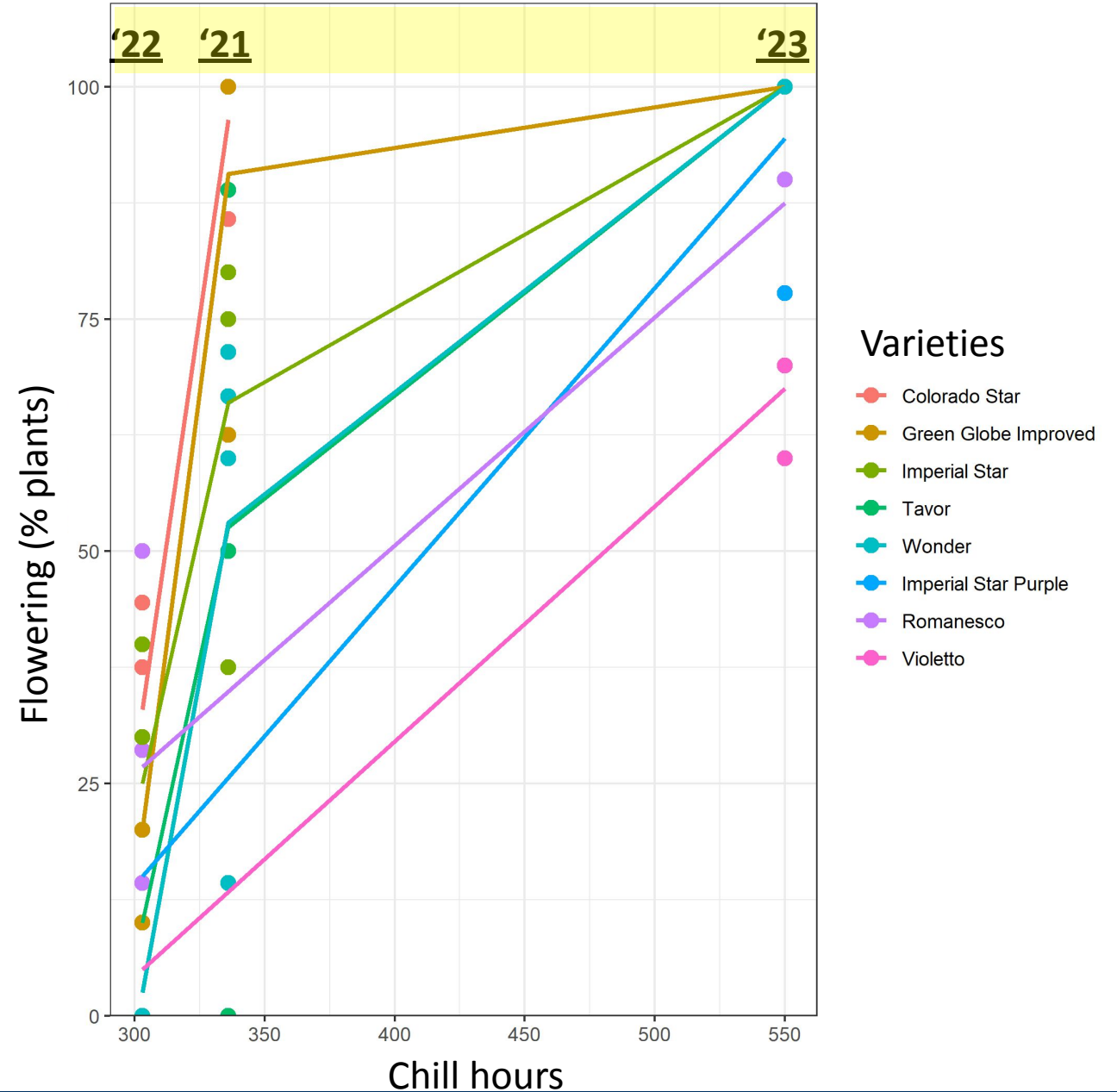
3) Mulching

Vernalization methods

	2021	2022	2023
Location	walk-in cooler	lab refrigerator	walk-in cooler
Light	turned on in sync with natural day/night	none	full-spectrum LED lights
Temperature (°F)	40	44	42
Duration	336 h = 14 d	303 h = 12.6 d	550 h = 23 d

Vernalization

- The proportion of plants that produced artichokes increased substantially with longer vernalization across all varieties
- Vernalization duration is more important than temperature
- **Updated recommendation:**
three weeks at 35 – 50 °F



Varieties

	Hybrid Status	Avail Organic?	Spiny?	2021	2022	2023
Colorado Star	OP		very	Johnny's	Johnny's	--
Green Globe Imp.	OP		yes	Osborne	Territorial	Osborne
Imperial Star	OP	✓	yes	Fedco	Johnny's	Johnny's
Imperial Star Purp.	OP	✓	no	--	Territorial	Territorial
Romanesco	OP		few	--	Northeast	Northeast
Tavor	OP	✓	few	High Mowing	High Mowing	High Mowing
Violetto	OP	✓	very	--	Territorial	Territorial
Wonder	F ₁	✓	no	High Mowing	High Mowing	High Mowing

Field trials

- Seeded into 50s in March, kept on 70 – 75 °F heat mats until germination plateaued
- Watered and moved to vernalization location at 4-6 true leaves
- Transplanted within three days of removing from coolers
- Single rows of black plastic at a 2' in-row spacing
- Plots all had 12 plants, and data were collected from the 10 central plants individually
- Buds were sorted into size classes and weighed
- Harvested weekly or biweekly until hard freeze



2021 variety evaluations

- Five varieties on three mulch treatments (bare ground, straw, and black plastic)
- Green Globe Improved produced more marketable artichokes than Colorado Star
- Wonder and Tavor seemed to devernalize on black plastic
- On bare ground, Tavor yielded more large buds (> 3" diameter) than Green Globe Improved
- On straw, Wonder produced more large buds than Imperial Star



2022 yield data

- Very low flowering rates
- Extremely variable production no significant differences between varieties
- 1 to 7.4 marketable buds per flowering plant

Cultivar	Flowering Plants (%)	Marketable Buds per Flowering Plant					
		Very Small (< 3")		Large (3 to > 4.5")		Total Marketable	
		#	g	#	g	#	g
Colorado Star	33	5.6	536	1.9	346	7.4	882
Green Globe Imp.	20	4.8	344	1.3	228	6.1	572
Imperial Star	25	3.1	313	1.4	306	4.4	619
Imperial Star Purp.	15	0.4	30	0.6	144	1.0	173
Romanesco	27	3.6	263	1.9	252	5.5	514
Tavor	10	1.3	95	0.7	135	1.9	229
Violetto	5	3.5	267	1.3	270	4.8	536
Wonder	3	2.0	189	0.3	72	2.3	261

2023 yield data

Cultivar	Flowering Plants	Marketable Buds per Flowering Plant						% Unmarketable	
		Very Small (< 3")		Large (3 to > 4.5")		Total Marketable			
	%	#	g	#	g	#	g	#	g
Tavor	100 a*	13.0 a	548 a	0.9 a	153 a	13.9 a	702 a	22.2 c	15 bc
Green Globe Imp.	100 a	12.5 a	526 ab	0.4 ab	69 ab	12.9 a	595 ab	22.1 c	15 bc
Wonder	97 a	12.0 a	555 a	0.7 ab	129 ab	12.7 a	683 a	23.1 bc	14 bc
Romanesco	88 a	12.2 a	510 ab	0.3 b	42 b	12.5 a	552 ab	15.2 c	11 c
Imperial Star	100 a	9.5 ab	430 ab	0.8 a	136 ab	10.3 ab	566 ab	44.7 a	30 a
Imperial Star Purp.	92 a	9.0 ab	372 ab	0.4 ab	68 ab	9.5 ab	440 b	37.8 ab	26 ab
Violetto	68 b	6.1 b	346 b	0.6 ab	91 ab	6.7 b	437 b	13.0 c	11 c

- High flowering rates (550 h vern.)
- Tavor stood out as high-yielding variety in all categories
- Romanesco and Violetto yielded poorly but had lowest cull rates

Mulch trials: 2022 and 2023

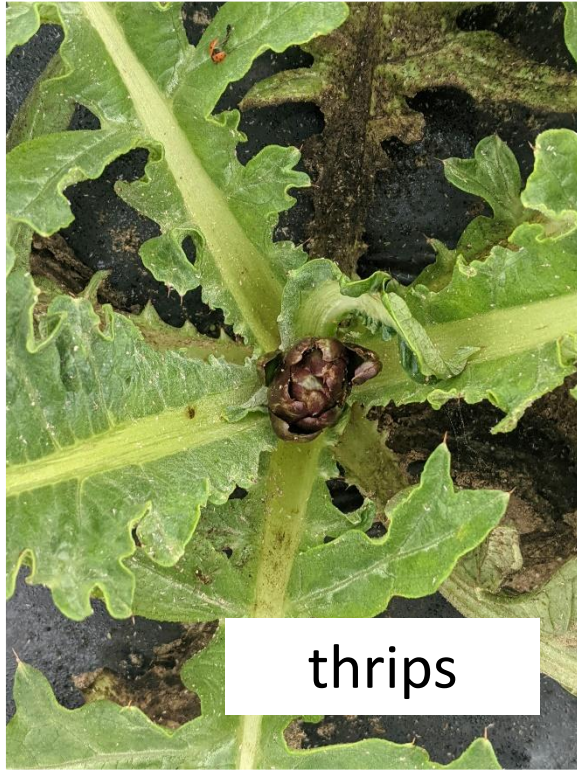


Mulch effect on artichoke yield

Mulch	Flowering Plants	Marketable Buds per Flowering Plant						% Unmarketable	
		Very Small (< 3")		Large (3 to > 4.5")		Total Marketable			
	%	#	g	#	g	#	g	#	g
2022									
Bare ground	30	1.8 B	141	1.3	222	3.0	363	0	0
Black plastic	5	13.0 A	644	1.0	158	14.0	802	0	0
Reflective	20	8.2 A	513	2.2	342	10.3	870	2.6	2.4
2023									
Bare ground	95	9.2	370	0.5	71	9.7	441	29.7	19.1
Black plastic	100	12.2	559	0.8	131	13.0	690	24.8	13.7
Reflective	95	16.6	679	0.4	60	17.0	738	31.7	22.3

Pest insects

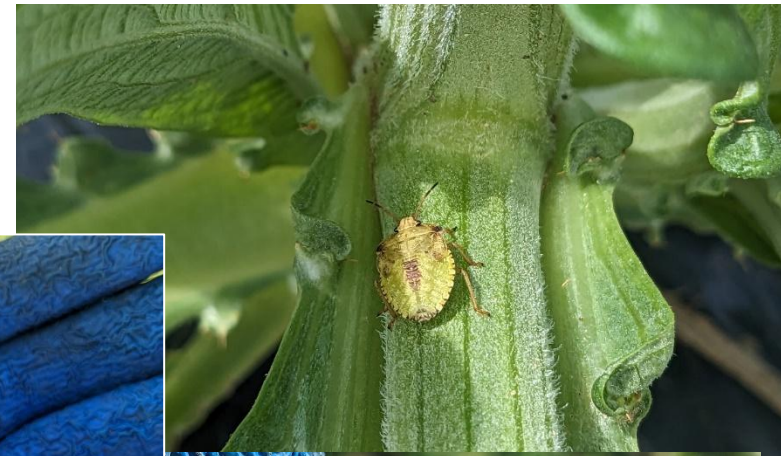
tarnished
plant bug



thrips



stink bug



Diseases

- Gray mold (*Botrytis cinerea*) is primary disease of concern
- Susceptible to same strain of verticillium wilt (*Verticillium dahliae*) as lettuce and strawberries



gray mold



What to know

- **Vernalize well!** Three weeks at 35 – 50 °F
- Ensure that your market will be receptive to small artichokes
- Tavor, Wonder, and Green Globe Improved can produce good yields with adequate vernalization
- Purple cultivars are unreliable
 - Black mulch will help control weeds and without negative devernalizing effects if vernalization is adequate
 - Wear gloves when harvesting



Looking forward

- Exploring breeding lines for regional adaptation
- Quantifying chill requirements and exploring devernalization

- Be in touch:
peyton.ginakes@maine.edu
- Stay tuned:
extension.umaine.edu/highmo
or



Thank you!

We thank Greg Koller, Pete Lugner, Pat McManus, Brooke Martin, Renae Moran and Steph Wright for their assistance and guidance.

We also thank assistants John Brenner, Chantal Cyr, June Foyt, Ethan Handley, Lydia Handley, Lee Lavoie, Abby Lucas, Karla Mendoza, and Taylor Truman.

Coast of Maine Organic Products and High Mowing Organic Seeds generously donated materials to this project.

This work was supported by the Maine Vegetable and Small Fruit Growers Association, the New England Vegetable and Berry Growers Association, University of Maine Cooperative Extension, and the USDA-NIFA Hatch Project ME0-22320.



Coast of Maine



Green Globe Improved

- Old, standard cultivar
- Generally yields well but underwhelming consistency and appearance
- Pointy, sometimes jagged bracts tend to splay prematurely



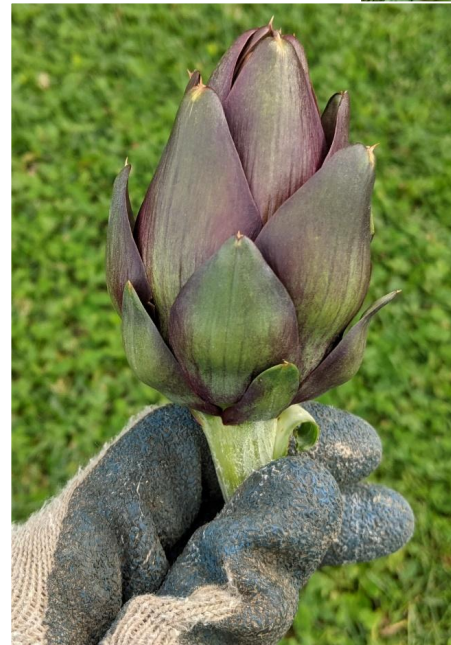
Imperial Star, Imperial Star Purple

- First cultivar bred for annual production
- IS tends to yield more than ISP and is generally a top-yielding variety
- Purple on ISP is subtle
- Not especially consistent but more attractive than GGI



Colorado Star

- Purple variety with Imperial Star parent
- Color dependent on temps (hotter weather = less purple)
- Fairly uniform shape
- Pointed bracts; often tough / leathery and rarely compact
- Very spiny, pointed bracts



Romanesco

- Heirloom variety with occasional blush color at bract tips
- Less vigorous than other cultivars and lower yield of large buds
- Remarkably variable; best quality at very small sizes



Tavor

- High-yielding, high quality
- More uniform appearance than GGI and IS
- Generally round buds and rounded bracts
- Dense & compact
- Available organic



Violetto

- Purple cultivar with gorgeous color in cool temperatures
- Extremely variable
- Low-yielding
- Usually very spiny



Wonder

- Only hybrid cultivar in trial
- Also available organic
- Good yields in 2022 and 2023
- Relatively compact buds, but overall shape is variable
- Not spiny

