

Green okra variety trial for southern Ontario , Year 2

IN A NUTSHELL

Building on the 2022 okra variety trial, Rav and others wanted to trial green okra to determine the best varieties for southern Ontario.

- Similar to 2022, Emerald Green performed well with respect to yield, marketability and flavour
- New to the 2023 trial, Annie Oakley OP also performed well
- Dwarf Lee and Cajun Jewel were the lower performing varieties
- Growers identified season extension and regionally adapted varieties as priorities for growing okra well in southern Ontario

MOTIVATION

Okra originated in Africa, where it is cultivated as a staple crop for roasting, baking, frying, and adding to stews and sauces. The Igbo language of southeastern Nigeria is credited with giving okra its English name, as “okwuru” became “ochra” and eventually “okra”. It is also known as bhindi, okro and lady’s fingers.

From Africa, okra spread to the Middle East and India by traders and travelers, where it became an integral part of local cuisines. African communities also brought okra to North America during the transatlantic slave trade. Okra remains a part of cultural heritage in the southern US and the Caribbean.

With this strong connection to culture and cuisine, locally-grown okra is in high demand, especially in urban city centres. As a warm season crop, however, okra responds to the relatively short growing season in southern Ontario with low yields. For this reason, growers continued their work from 2022 to assess currently available varieties for their productivity in southern Ontario. To learn more about the 2022 project, read the research report, “Okra variety trial for southern Ontario and southern Québec,” available at efao.ca/research-library.

METHODS

Growers selected four varieties of open-pollinated green okra of various shapes: some spineless, some with spines, and all sourced from local ecological seed companies. They chose Emerald Green, Dwarf Lee, Cajun Jewel and Annie Oakley OP. More details on each variety in **Table A1**.

Growers from each farm grew two replicate sections with 10 plants of each variety, with an example layout in **Figure 1**. They measured germination at 12 and 24 days, and assessed early season vigour, yield, marketability, taste and texture, and overall performance.

They used planting and cultivation recommendations listed in Table A2. For reference, Rav seeded okra on approximately April 29, 2024 on a heating mat with tray cover, and transplanted May 26, 2024.



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Seed Change



Okra plant growing in the Demonstration Gardens at Fertile Ground Farm.

DATA ANALYSIS

To evaluate the varieties, we used a statistical model called analysis of variance (ANOVA) with a 95% confidence level to calculate the least significant difference (LSD). When the difference between two treatment means is greater than the LSD, we can conclude that there's consistent difference between two treatment 95% of the time. We could make these statistical calculations because this study involved replication of treatments, both within and among farms.

FINDINGS

GERMINATION

Growers recorded germination rates at days 12 and 24. At day 12, Cajun Jewel (81%) and Annie Oakley OP (77%) had higher germination rates than Dwarf Lee (49%) and Emerald Green (61%); with a similar trend on day 24 as seen in Figure 2.

YIELD

Annie Oakley OP was a top performer with respect to total pod count, total pod weight and marketable weight per plant (Table 1). Green Emerald also had a reliable performance in 2023 as it did in 2022.

Overall, all yield measurements tracked the same with respect to the order of varieties (Figures 2, 3 & 4):

- Annie Oakley OP produced more than Dwarf Lee; and had the highest mean, which is not statistically distinguishable from the Cajun Jewel and Emerald Green
- Emerald Green had no unmarketable pods, while the other three varieties had some unmarketable pods

RATINGS & GROWER NOTES

Due to a high variability among varieties, it was hard to tease apart differences in ratings. That said, Annie Oakley OP and Emerald Green consistently ranked higher than Dwarf Lee and Cajun Jewel (Tables 2 & 3).

For Annie Oakley OP, growers noted that it had "long slender pods that weren't as productive as the others." It also seemed "most prone to disease, appearance was so-so with some bumps and it was prone to becoming woody with concerns over quality for customers."

For Emerald Green, growers noted that it had "uniform development and growth, early production, consistent harvest." It also had "little to no issue with woodiness/less disease, competitive marketable yield and sellability, was easy to pick, and consistent texture."

For Dwarf Lee, growers noted "variation in length of pod, and that it was least flavourful of the varieties and more prone to disease."

For Cajun Jewel, growers noted they had "extremely small plants that were prone to become woody, but woodiness was difficult to discern based on size and appearance." They added, "the pods curled and the thickness of the pods made them harder to sell."

NEXT STEPS

In 2024, Rav and Ekow Stone, another farmer-member of EFAO from It's Giving Farm, started work to breed a regionally adapted okra variety.

BLOCK A			
V2	V3	V4	V1
Min. 10 plants	Min. 10 plants	Min. 10 plants	Min. 10 plants
BLOCK B			
V4	V3	V1	V2
Min. 10 plants	Min. 10 plants	Min. 10 plants	Min. 10 plants

Bed length ----->

Figure 1. Example layout with two replicate blocks of four varieties (V) and a minimum (min.) 10 plants/variety down a single row. For in-field set-up, each farm randomly assigned varieties to a plot in each block. Depending on the garden plan at each farm, a block could be spread across multiple rows.

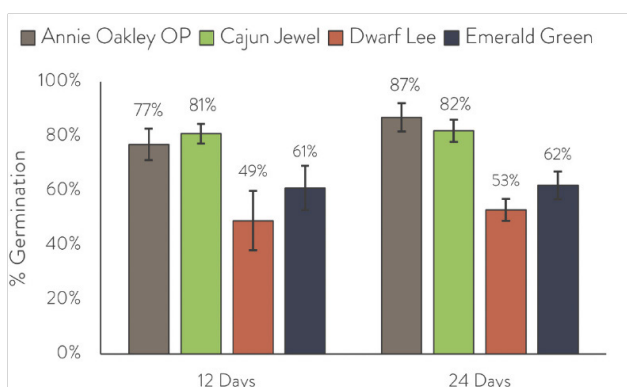


Figure 2. Germination at days 12 and 24 for the four varieties of okra in 2023.

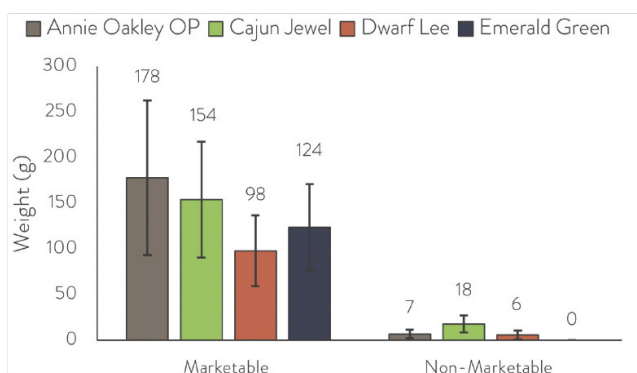


Figure 3. Total marketable weights for each variety

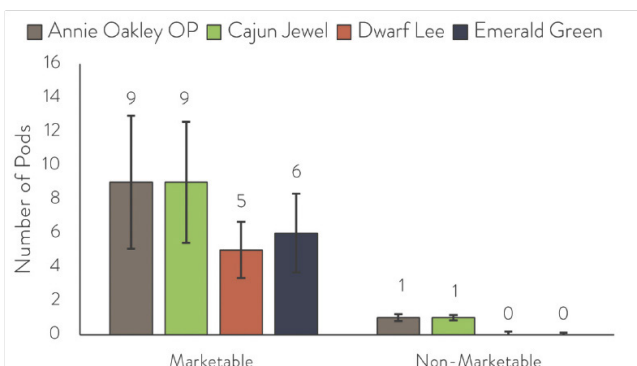


Figure 4. Marketable pods per variety.



Example of pods from Annie Oakley OP and Dwarf Lee at Shade of Miti farm.

Table 1. Mean plants, total pod count and weight for each variety collected over the growing season.

VARIETY	PLANT NUMBER	TOTAL POD COUNT	TOTAL POD WEIGHT (g)	MARKETABLE WEIGHT PER PLANT (g)	NON-MARKETABLE WEIGHT PER PLANT (g)
Annie Oakley OP	12	137 a	2688 a	178 a	7 ab
Cajun Jewel	13	118 ab	2297 ab	154 ab	18 a
Dwarf Lee	11	64 b	1320 b	98 b	6 ab
Emerald Green	12	82 ab	1657 ab	124 ab	0 b
LSD	NS	51	895	55	10

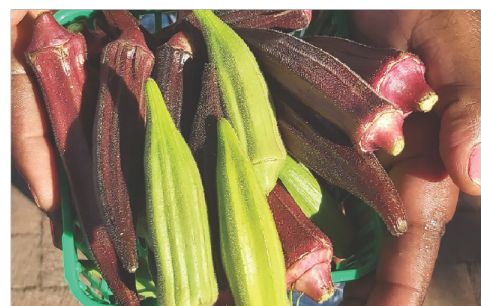
Table 2. Grower ratings of the four varieties compared in 2023.

VARIETY	EARLY SEASON VIGOUR RATING	MARKETABILITY RATING	FLAVOUR RATING	OVERALL RATING
Annie Oakley OP	2.5	3.4 ab	4.0	3.2
Cajun Jewel	2.7	2.8 b ab	3.6	2.4
Dwarf Lee	2.6	3.0 ab	3.8	3.4
Emerald Green	3.3	3.8 a	4.4	3.6
LSD	NS	0.7	NS	NS



Table 3. Growers were asked “Would you grow this variety of okra again?”

VARIETY	RAV	FOODSHARE	ANN	DEMO GARDEN
Annie Oakley OP	Yes	Yes	Yes	Maybe
Cajun Jewel	No	Maybe	Yes	Maybe
Dwarf Lee	Yes	No	Yes	No
Emerald Green	Yes	Maybe	Yes	Maybe



Okra collected at the Demonstration Gardens at Fertile Ground Farm and Shade of Miti farm.

TAKE HOME MESSAGE

Annie Oakley OP and Emerald Green led the varieties, but grower preference varied based on how each variety fit into their individualized operation—and none of the varieties tested had great productivity. However, the growers agreed that conducting the trial together improved their knowledge and success with the crop.

The relatively short season in southern Ontario means that future work should focus on season extension or regional breeding in order to make this a profitable crop for market gardeners moving forward.

APPENDIX

Table A1. Okra varieties grown in this trial and their characteristics.

VARIETY	COLOUR	DTM	SOURCE	POD LENGTH	GROWER NOTES
Annie Oakley OP	Green	52	Commonwealth Seeds	6 inches	Very productive, compact plants with spineless, uniform and tender green pods. Was recommended to us last year.
Cajun Jewel	Green	50	Commonwealth Seeds	6-7 inches	Why didn't we try this one last year? Everyone says it's the one for northern climates. Also a dwarf, spineless.
Dwarf Lee	Green	55	Gaia Organic Seeds	6-7 inches	Dwarf 3'-4' tall plants in this early, productive variety. Pods are intermediate between slender and stocky. Good flavor and texture.
Emerald Green	Green	55	Gaia Organic Seeds	6-7 inches	This famous heirloom is a vigorous, early producer of round, velvety green pods on tall, robust plants. Emerald okra was bred and released by the Campbell's Soup Company in the early 1950's. We found this variety to be a standout in our 2022 okra trial.

Table A2. Planting and cultivation recommendations for the okra trial in 2023.

PLOT SIZE PER VARIETY	10 plants per variety section, 2 replicate blocks = 20 plants total for each variety in the trial
ROW AND BED SPACING	In-row: 12"-18"; between row: 24"-36"
SEEDING DATE	4-6 weeks before planting out; early to late April
SOAKING SEEDS	Okra seeds have a hard seed coat: you can speed up germination by soaking the seeds for 8-24 hours in room temperature water before seeding, or nicking the seed with sandpaper or nail clippers (scarification).
GERMINATION	Okra love heat and optimum soil temperature range is 24-32C! Heating mats are ideal for okra transplants.
TRANSPLANTING DATES	4-6 weeks after the last frost; late May to early June around the time you are transplanting tomatoes and other hot crops. Do not disturb roots. Weed control is important in this crop,
CULTIVATION	especially when the plants are small. Cultivation should be shallow to prevent damage to the roots of the crop. Because okra love heat, some farmers have found they get better yields when the crop is planted in black landscape fabric or plastic or other mulches that warm up the soil. To avoid keeping the soil cool and delaying the harvest, some farmers hoe the transplants until hot weather arrives and only with the hot weather do they use organic mulches such as spoiled hay to prevent moisture loss and suppress weeds.
DAYS TO HARVEST	55-64 days from transplant
HARVESTING	Start picking when pods are no more than 7 inches long (depending on variety) – this takes about four to five days from flowering. If you allow pods to develop to their full size, the plant will stop producing. The smaller pods should also be soft. As they get larger, they will become tough, fibrous and unfit for green use. For a continuous harvest, pick the pods every two to three days. Okra can be harvested by hand, but using pruning shears or a sharp pocket knife can minimize damage to the plant. Handle okra carefully because the pods bruise easily. Growers can sell, share, distribute, or eat these okra pods as best fits their farming operations.
POST HARVEST	The optimum conditions for storing fresh okra are a moist environment and temperatures of 7 to 10 °C. Okra should not be washed before storing it in the refrigerator, as this will speed up decay. If properly harvested, handled, not washed, and stored correctly, good quality pods keep in the refrigerator for about seven days.

Robert and Moira Sansom
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