Crop Planning for Vegetable Growers

Photo: Luke Freeman, University of Arkansas

NCAT
ATTRA
SUSTAINABLE AGRICULTURE
A PROGRAM OF THE NATIONAL CENTER FOR APPROPRIATE TECHNOLOGY

USDA

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Learning Objectives

- Understand the importance of farm planning and recordkeeping
- Understand how to plan crops to meet production goals and wholesale contracts
- Understand how to calculate planting dates based on an anticipated date of harvest
- Understand key records to keep to assist with production planning in the future

The Context – Farm Business Plan

1. Knowing your values
   - ***What's important to you?***
2. Understanding your situation
   - ***What are your resources?***
3. Mission statement and goals
   - ***What is your vision for the business?***
4. Strategic plan
   - ***How will you get there?***
5. Implementing and monitoring your business plan

McGarrah's strawberry farm. Photo: Luke Freeman, University of Arkansas

Adapted from *Building a Sustainable Business* by DiGiacomo, King, and Nordquist

Crop Planning – Begin at the End

- **How much to grow?** ← *How much can you sell?*
- **What's the demand?**
  - Farmers market
  - CSA shares
  - Wholesale accounts

Fayetteville Farmers Market. Photo: Nina Prater, NCAT

Full Bell Farm CSA. Photos: Rex Dufour, NCAT

Recordkeeping and Planning

- **Importance of recordkeeping**
  - Anticipate market demand
  - Know which crops are profitable
- **Use off-season for planning**
  - Annual vs. long-term planning

Terrell Spencer of Across the Creek Farm discusses farm records.
Photo: Robyn Metzger, NCAT

Truly Living Well - Wheat Street Gardens. Photo: NCAT

What records should you keep?

- Weekly sales at market
- Which products sell out first
- Which products are left on the table

Fine-tuned records for profitability

- What is the profit margin on each product?
  - Inputs for production
  - Labor for planting, weed control, and harvest
  - Gross revenue from sales
- ATTRA templates

Photos: Rex Dufour, NCAT

How Much to Grow – Tomato Example

- **Farm to School will buy 20,000 lbs. of slicing tomatoes at $1.60/lb. throughout the fall semester**
  - Want to supply **10,000 lbs between August 15 and October 20**
  - 10,000 lbs × $1.60/lb = **$16,000**
  - Know production costs *(what will be your net profit?)*
  - Choose tomato variety for consistent quality and good yield

Photos: Luke Freeman, University of Arkansas

How much should you plant?

- **Know production goals**
- **Know anticipated yield**
  - per plant
  - per 100-ft. row or bed
  - per acre
- **Account for crop loss, 10-25%**
- **Calculate land needed for crop**
  - How many plants, row feet, beds, or acres?
- **Seed need for crop**

Photos: Luke Freeman, University of Arkansas

How Much to Plant – Tomato Example

- **Production goal: 10,000 lbs.** of tomatoes
- **Anticipated yield?**
  - Assume **5 lbs./plant** or **24,200 lbs./acre**
  - *Recordkeeping for accurate yield estimate*
- **Plant spacing?**
  - 6′ row spacing with 18″ between plants = **4,840 plants/acre**
  - 6′ row spacing = 7,260 row ft/acre
- ***Crop loss factor = 25%***
  - 10,000 lbs. × 1.25 = **12,500 lbs.**

Photo: Luke Freeman, University of Arkansas

Johnny's Seeds

Feet of Row Per Acre (1 acre=43,560 square feet)

Single Rows Distance Apart	Number of Row Feet/Acre	Rows/Bed on beds spaced 6 ft. on cntr.	Number of Row Feet/Acre
12"	43,560	1 row	7,260
16"	32,670	2 rows	14,520
18"	29,040	3 rows	21,780
20"	26,136	4 rows	29,040
24"	21,780	5 rows	36,300
28"	18,668	6 rows	43,560
30"	17,424		
32"	16,335		
36"	14,520		
40"	13,068		
42"	12,445		
48"	10,890		
60"	8,712		
72"	7,260		

Number of seeds to plant/acre: Find your row spacing on the chart. Multiply the corresponding row feet per acre figure by the number of seeds (plants) you plan to sow per foot to arrive at the number of seeds you will need per acre. **Example:** You plan to sow 20 seeds per foot on rows 24" apart; 20 x 21,780=435,600 seeds/acre.

How Much to Plant – Tomato Example

- **How much land is needed?**
  - 12,500 lbs. ÷ 24,200 lbs./acre = **0.52 acres**
  - 0.52 acres × 7,260 row ft/acre = **3,775 row ft**

Photo: Luke Freeman, University of Arkansas

How Much to Plant – Tomato Example

- How much land is needed?
  - 12,500 lbs. ÷ 24,200 lbs./acre
    = **0.52 acres**
  - 0.52 acres × 7,260 row ft/acre
    = **3,775 row ft**
- **How many plants are needed?**
  - 12,500 lbs. ÷ 5 lbs./plant
    = **2,500 plants**
  - 0.52 acres × 4,840 plants/acre
    = **2,517 plants**
  - 3,775 row ft ÷ 1.5′ spacing
    = **2,517 plants**

Photos: Luke Freeman, University of Arkansas

How Much to Plant – Tomato Example

- How much land is needed?
  - 12,500 lbs. ÷ 24,200 lbs./acre = **0.52 acres**
  - 0.52 acres × 7,260 row ft/acre = **3,775 row ft**
- **How many plants are needed?**
  - 12,500 lbs. ÷ 5 lbs./plant = **2,500 plants**
  - 0.52 acres × 4,840 plants/acre = **2,517 plants**
  - 3,775 row ft ÷ 1.5′ spacing = **2,517 plants**
- **How much seed?**
  - *Add 20% to seed order to adjust for germination failure*
  - 2,517 plants × 1.2 = **3,021 seeds**
  - 3,021 seeds ÷ 7,400 seeds/oz = **0.41 oz seed**

Photos: Luke Freeman, University of Arkansas

When to Plant?

- **Count backward from date of sale**
- **Use days to maturity (DTM) in seed catalog as a start**
  - *Your own records will give you the most accurate DTM*
  - Affected by environment
  - Cultivar dependent
- **Time in greenhouse?**
  - Add to DTM
- **How long will crop hold in field?**
- **Harvest all at once or over time?**

Photos: Luke Freeman, University of Arkansas

When to Plant – Tomato Example

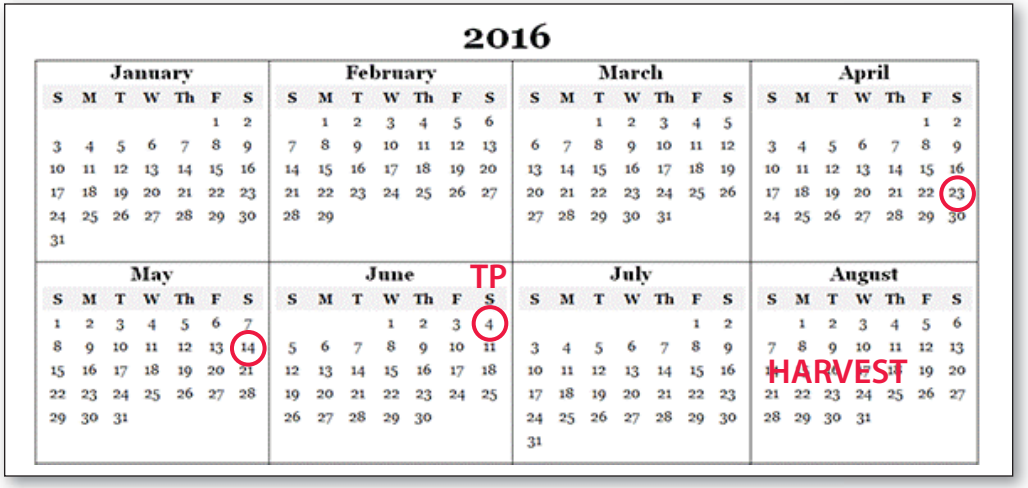
- Date of first sale = **August 15**
- DTM = 72 days from TP → **June 4**
- Greenhouse = 6 wks or 42 days → **April 23**
- Crop in field = assume 3 weeks, determinate cv.
- Harvest for 9 weeks, until October 20
  - 9 ÷ 3 = 3 planting dates

Planting Dates:

April 23

May 14

June 4



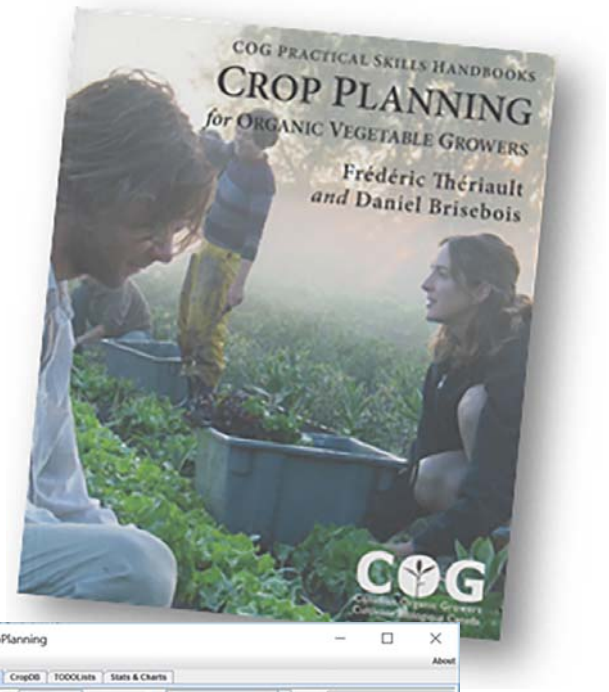
When to Plant – Tomato Example

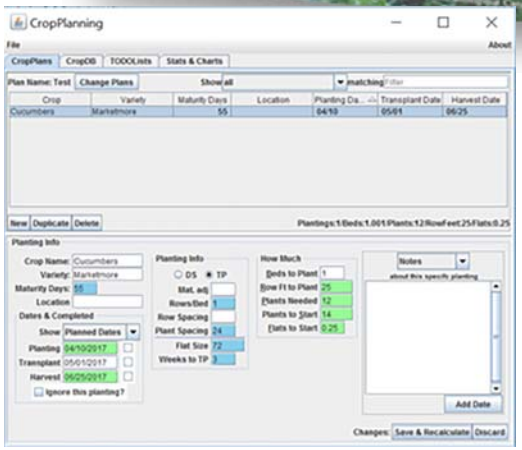
Start Seeds	2,517 plants × 1.2 (germ adj) ÷ 3 sowings
April 23	1,000 seeds / 0.14 oz seed / 20 plug flats (50-cell)
May 14	1,000 seeds / 0.14 oz seed / 20 plug flats (50-cell)
June 4	1,000 seeds / 0.14 oz seed / 20 plug flats (50-cell)

Plant in FD	# of Plants	3,775 row ft ÷ 3
June 4	839 plants	1,259 row ft
June 25	839 plants	1,259 row ft
July 16	839 plants	1,259 row ft

Resources

- **ATTRA**
  www.attra.ncat.org
- ***Crop Planning for Organic Vegetable Growers***
  by Frederic Theriault and Daniel Brisebois
  – Worksheets available from www.cog.ca
  – Search "crop planning"
- **Johnny's Selected Seeds**
  – Info sheets at www.johnnyseeds.com
  – Look for "Online Tools & Calculators"
- **Growing Small Farms – NC State Extension**
  – Crop planning and scheduling forms for CSAs
  – https://growingsmallfarms.ces.ncsu.edu/growingsmallfarms-farmrecords
- **UC Santa Cruz – CSA Crop Planning**
  – http://casfs.ucsc.edu/documents/Teaching%20Direct%20Marketing/4.5_CSA_crop_plan.pdf
- **Crop Planning program (free)**
  – https://code.google.com/p/cropplanning





COG Worksheets – www.cog.ca

Crop Planning for Organic Vegetable Growers

Sales Projection for : Farm to School
Year: 2016

Crop	Unit	Value ($)	Dates										Total units	Total $
			11-Aug	18-Aug	15-Aug	1-Sep	8-Sep	15-Sep	22-Sep	29-Sep	6-Oct	13-Oct		
Tomato	lbs	1.60	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	10,000	$16,000.00
Lettuce	lbs	2.00						50	50	50	50	50	250	$500.00
Kale	lbs	1.80						100	100	100	100	100	500	$900.00
Target Weekly Sales ($)			$1,600	$1,600	$1,600	$1,600	$1,600	$1,880	$1,880	$1,880	$1,880	$1,880		$17,400.00

- Weekly sales projections will help you with cash flow statement.

COG Worksheets – www.cog.ca

Crop Planning for Organic Vegetable Growers

Planting Schedule for Tomato

Year: 2016

Crop	Notes Family Variety	Rows per bed	Inrow Spacing	4-Jun	25-Jun	16-Jul		Total bed length	Standard Bed Length	Total full beds
Units										
Tomato	Solanacea	1	1.5	1259	1259	1259		3777	100	37.77
								0		#DIV/0!

GH worksheet for: Tomato

Year: 2016

							if not potting up			Trays to seed				
							if potting up			Trays to PU			Trays to seed	
Variety	**Field Date**	**GH days**	**GH Date**	**Bed length**	**rows/bed**	**inrow spacing**	**GH SF**	**Tray Size**	**Calculate trays**	**Actual trays**	**GH SF seeded**	**Tray Size**	**Calculate trays**	**Actual trays**
Units				ft		ft								
Celebrity	**4-Jun**	42	**23-Apr**	1259	1	1.5	1.1	24	38.469	39	1.2	50	22.464	23
Celebrity	**25-Jun**	42	**14-May**	1259	1	1.5	1.1	24	38.469	39	1.2	50	22.464	23
Celebrity	**16-Jul**	42	**4-Jun**	1259	1	1.5	1.1	24	38.469	39	1.2	50	22.464	23

For more information

NCAT ATTRA SUSTAINABLE AGRICULTURE

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