



2009-2010 Farm Business Course

Student Manual



Tufts
UNIVERSITY

Gerald J. and Dorothy R.
Friedman School of
Nutrition Science and Policy



This material is based upon work supported by USDA/NIFA under Award Number 2007-49200-03888

Fall 2009 Farm Business Planning

Cycle One: October-November

Date and Time	Day	*Topic
October 20, 2009 6-9 pm	Tuesday	Intro to Farm Business Planning and Enterprise Selection
October 27, 2009 6-9 pm	Tuesday	Marketing and Sales
October 31, 2009 6-9pm	Tuesday	Field Trip: "Marketing Options" Explore a variety of market outlets first hand.
November 3, 2007 6-9 pm	Tuesday	Crop Planning and Production
November 10, 2009 6-9 pm	Tuesday	Equipment and Supplies Sourcing: Startup Budgets
November 17, 2009 6-9 pm	Tuesday	Farm Financials: Writing the Business Plans
November 24, 2009 6-9 pm	Tuesday	Writing the Business Plan II and Real Stories from Guest Growers
December 15, 16, 17, 2009	Tuesday-Thursday	New England Vegetable and Fruit Conference, Manchester, NH
January 16, 2009 9am-5pm	Saturday	NOFA Winter Conference- Worcester, MA 9-5
March 23, 2010 TBD	Tuesday	Graduation Ceremony and Pre-Season Celebration!

Winter 2010 Farm Business Planning

Cycle Two: January-February

Date and Time	Day	*Topic
January 5, 2010 6 pm-9 pm	Tuesday	Intro to Farm Business Planning and Enterprise Selection
January 12, 2010 6 pm-9 pm	Tuesday	Marketing and Sales
January 16, 2010 6 pm-9pm	Saturday	NOFA Winter Conference- Worcester, MA 9-5
January 19, 2010 6 pm-9pm	Tuesday	Crop Planning and Production
January 26, 2010 6 pm-9pm	Tuesday	Equipment and Supplies Sourcing. Startup budgets
Feb 2, 2010 6 pm-9 pm	Tuesday	Farm Financials: Writing the Business Plans
February 9, 2010 6pm-9pm	Tuesday	Writing the Business Plans II and Real Stories from Guest Growers
TBD	Saturday	Field Trip: "Marketing Options" Explore a variety of market outlets first hand.
TBD	Monday	Graduation Ceremony and Pre-Season Celebration!

Table of Contents

Session One: Marketing and Sales.....	4
Session Two: Intro to Business Planning and Enterprise Selection.....	31
Session Three: Crop Planning and Production.....	123
Session Four: Crop Planning Continued and Equipment, Supplies and Sourcing; Start-up Budgets.....	158
Session Five: Business Planning – Part 1.....	180
Session Six: Business Planning – Part 2: Writing the Narratives and Hearing Stories from Real Growers.....	194

Session Three

Crop Planning and Production

Learning Objectives are the main points that you will be taking away from each lesson. It is important that you keep the learning objectives in mind throughout the class. Learning objectives will change from class to class.

Learning Objectives

- You will continue learning about enterprise selection and improve your enterprise list.
- You will learn how to understand an enterprise budget
- You will learn about specific fruit/vegetable crop culture by family
- You will learn how to do crop planning as part of your farm business plan

Agenda

- 1) Review of homework from last week: 6:15-6:45
- 2) Crop cultures 6:45- 8:00

BREAK: 8:00-8:15

- 3) Crop Planning 8:15-9:15

I. Review of homework from last week

Please take out your completed enterprise list and be prepared to share with the class which enterprises you chose. Remember that your work in this class will be evolving, and that your enterprise list (and many other things!) will change over time.

Please have at least one of your completed enterprise budgets out and ready for review.

Please be prepared to talk about which business plan template you selected. Talk to the class about some of the reasons you made your choice.

II. Crop cultures

In this section you will learn more about some of the crops you've selected to grow. When a farmer plans their crops, they in turn plan their cash flow, time and resource allocation, and eventually their land use. Learning about crop cultures will give you the knowledge you need in order to move onto the next step of your farm business plan.

You will be shown a Presentation and are welcomed to follow along here in your text.

Active learning is recommended, and note taking while the presentation is taking place is suggested. Please go to the next page and follow along with the slides.



New Entry presents: Crop Cultures

What are crop cultures?



Increase your knowledge.



Increase your yields.



Where do you find information
about your crops?



Plant families:
BRASSICACEAE



Plant families:
ALLIACEAE



Plant families:
SOLANACEAE



Plant families:
CUCURBITACEAE



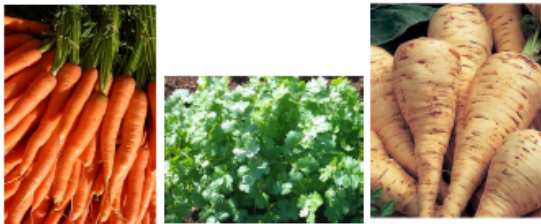
Plant families:
FABACEA



Plant families:
CHENOPODIACEAE



Plant families:
APIACEAE



Plant families:
ASTERACEAE



Plant families:

POACEAE



Broccoli: case study
of crop culture
similarities within the
brassica family.

Seed size and appearance.



Germination and plant growth.



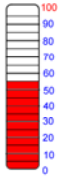
Nutrient needs.



Water and irrigation needs.



Climate requirements.

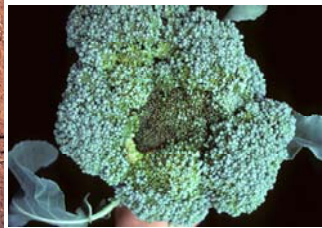


Pests and pest pressure.





Diseases.



Harvesting/handling issues.



Materials and equipment.



Now you try.

The Allium Family- *Allium cepa* (and other species)

Crops: onions, garlic, shallots, leeks, chives

Soils: Rich organic soil that holds moisture well. Also put compost or manure right into the rows. Onions need good amounts of nitrogen otherwise they may bolt during the first cold spell. Too much nitrogen can delay bulbing, so it is best to apply manure in the fall. Onions do poorly in salty soil and like a soil that is not too acidic.

Starts: Onions: can be started from sets, transplants, or seeds. Sets will give you quicker results and are easier to plant and care for but many will bolt and go to seed. Sets must be stored just above freezing or above 65°F, and you must find a reputable dealer to ensure that they were stored properly. Transplants should be started about six weeks before you plan to move them outdoors. They like to be grown in cooler temperatures as it produces hardier plants. Onion seeds need soft, loose soil to germinate and row covers will provide them with a head start in cooler weather. Garlic: is planted in October and immediately mulched before the cold weather sets in.

Transplants: Onions bulb depending upon temperature and day length, both of which vary depending upon specific onion varieties. Also, watch out for weeds. Onions grow slowly at first and weeds can quickly overtake the young plants.

Irrigation: Soil must be moist. Onion roots do not go very far down, rarely descending more than 10", so frequent, shallow waterings are best.

Pests: Onion thrips, garlic nematode

Pest Management: Keep area around onions and garlic free of weeds. Spanish onions are quite resistant.

Post-harvest handling: Onions: When the tops of the onions fall over, they have finished growing and are ready for harvest. At this time, you should stop watering them so the bulbs can dry out. Dig them out before the tops start to rot and, if storage onions, cure (dry) them out of the direct sunlight. Let them cure for one week if dry, warm weather or two weeks in cool, cloudy weather. After curing, break off any tops but leave the protective scales on. Store onions as close to 32°F without freezing as possible and at 60-70% humidity. This should reduce sprouting growths. Sprouting generally indicates overly warm storage, improper curing, or premature harvesting. Garlic: Ready to be harvested when the tops turn yellow, usually in summer. Cure them as you would cure onions and should be kept at 32°F. It will sprout quickly at 40°F.

The Cabbage Family- *Brassica oleracea*, *Brassica rapa*, *Brassica juncea*

Crops: cabbage, kale, collards, kohlrabi, broccoli, cauliflower, Brussels sprouts, Pak choi, Tat soi, mustard greens, Hon Tsai Tai, etc.

Soils: Need *rich* soils right from planting because the heads form rapidly and utilize much of the soil's stored nutrients. The crops will be very small if the soil is not rich enough. But be careful, too much nitrogen will cause damage and growth problems as well. Ensure that your soil has plenty of organic matter and that should be enough nitrogen.

Starts: Begin inside in six-packs with potting soil that is not too rich in nitrogen. Plants started in potting soil too rich in nitrogen will be less hardy. Put the containers in a warm place ~85°F until germinated and then move to a cooler place between 45°F - 65°F.

Brassicas germinate well in warm temperatures but do not grow well in them. The Asian greens are particularly sensitive to warm-cool-warm cycles and if in conjunction with lengthening days, can often lead to bolting. They prefer cooler weather and form higher sugar content in their leaves as a result.

Transplanting: Keep a row cover on them at first to facilitate growth and protect from flea beetles. Take the row covers off when the temperature reaches 70°F to prevent rotting and overheating.

Irrigation: They need moist soil always and should never become water stressed. They often need more water than potatoes, squash, or tomatoes. Water-stressed *Brassicas* often take on a blue color before wilting as opposed to well-watered plants, which are a dark green. Proper moisture is key! Keep the soil moist, but not wet and frequent, shallow waterings work well.

Pests: Flea beetles, cabbage looper, club root

Pest Management: Flea beetle: Row covers. Mixing in turnip seeds as a decoy crop, the leaves of which the flea beetles seem to prefer. Cabbage looper: The *Trichogramma* wasp, a beneficial insect, will lay their eggs in the cabbage looper caterpillar and kill them. You can buy the wasps through the mail or at an organic nursery. Bt (*Bacillus thuringiensis*), an organically approved bacteria, is very effective in caterpillar control and is also sold under the names Biotrol, Dipel, and Thuricide. Club root: If your field is infected with club root, keep the pH above 7.2 to help control it and don't plant any *Brassicas* in the affected area for at least two years.

Post-harvest handling: Cabbage: Harvest by pressing on the head to see if it is solid, and cut the cabbage head off the plant. If you leave two or three outer leaves will grow into a smaller second head. The heads need to be harvested before they crack. They cannot be sold when cracked and should be eaten immediately. If the outer leaves are damaged, they can be peeled off and the inner leaves should be undamaged. Store them as close to possible at 32°F and 90-95% humidity. Under these conditions, cabbages will keep for up to three-four months. Early varieties will last only 3-6 weeks. Kale and Collards: Can either be harvested by cutting whole plant or by picking individual leaves and stretching the harvesting season out much longer. Both these do very well in cooler weather. Cauliflower: Direct sunlight will brown the cauliflower white heads. As soon as the heads are walnut size, you can pull up the larger leaves and tie a string around them, shading them from the

sun. Harvest as soon as the curds become loose and if stored at 32°F and at 95% humidity, they will keep for up to a month. Broccoli: Heads best in cool weather around 68° F. You can cut heads off, leaving the plant and more heads will form. If flowers develop, cut them off right away so more shoots develop. Broccoli has a short shelf life, and will only keep for about two weeks kept at low temperatures and high humidity and will only last about a week in a refrigerator.

The Cucurbit Family- *Cucumis sativus*, *Cucurbita* sp, *Cucumis melo*, *Citrullus lanatus*

Crops: Cucumbers, melon, squashes (both summer and winter)

Soils: Love warm soil and optimal germination temperature is above 80° F. But soil temperatures in the upper 60°-70° is acceptable. Need a loose, rich soil to support their quick growth. Soil that contains a lot of organic matter will be light enough and hold the large amounts of water needed by cucurbits. Do not grow well in acid soil and do best with a pH above 7. Also do not grow well in salty soil so if you are adding poultry manure, do so in the fall so some of the salt can leach out.

Starts: If planted outdoors in cold temperatures, the seeds will rot. In New England, it is hard to have soil temps that warm earlier in the season, so its is best to start indoors. They do grow quickly so cucurbits should not be started more than four weeks before planting in the garden. Plant one seed per pot with the pointed seed upwards.

Transplanting: Traditionally planted in raised mounds called hills with the sun warming the elevated ground. If soil is not warm enough, can use plastic mulch, row covers, or mulch to keep the ground warmer. Never plant cucurbits (or any other crop) in the same place in the garden year after year. Not only does this facilitate disease transmission, but their rapid growth pulls many nutrients out of the soil. Legumes will do well after cucurbits to replenish nutrients.

Irrigation: They need a lot of water during their rapid growth and fruit production. Drip irrigation is best because you can provide a constant supply of moisture. Cucurbits are also sensitive to cold water because it can cool the soil temperature. If you have to irrigate with cold water, do so mid-morning while the sun is still warming the soil.

Pests: Striped cucumber beetle (leaf damage as well as vector for bacterial wilt), powdery mildew

Pest Management: Row covers work well for young plants, but be sure to remove covers daily for several hours during pollination times. Remove field-side vegetation used in the over wintering of the beetles.

Post-harvest handling: Cucumbers and Summer squash: Pick fruit often to encourage more fruit! Once a fruit sets, it will discourage the plant from producing more fruit. And be careful not to damage the leaves of the plants while harvesting as that may disrupt the flow of nutrients and water to the developing fruit. Storage at 45°-50°F at a relative humidity of 90-95%. They will keep for fourteen days under these conditions. Winter squash: Should be allowed to ripen fully on the vine before harvesting. Wait until the skin is hard (can't cut it with your nail) and cut the stem off as long as possible. Wash and dry thoroughly if dirty and store at 50°-60°F and low humidity. They should keep for 3-8 months. Melons: Use caution when handling the vines, as they are very sensitive. Harvest when a crack appears between stem and the fruit. Store cantaloupes in the refrigerator but not honeydews or casaba melons.

The Legume Family- *Phaseolus vulgaris*, *P. lunatis*, *Pisum sativum*

Crops: beans and peas

Soils: Well-drained soils above 5.5 pH. A large amount of organic matter will help keep in moisture and keep the soil loose enough to help with root formation. There doesn't need to be too much nitrogen in the soil because the legumes provide their own, but both phosphorus and potassium are essential to the formation of the legume pods.

Starts: Legumes are generally directly planted into your garden. If beans or peas have never been grown in your garden before, consider inoculating them with the *Rhizobia* bacteria that aids in nitrogen fixation. The bacteria are easy to purchase and easy to apply. Once legumes have been grown, the bacteria will stay in the soil for several years, so there is no need to inoculate every year. Legumes generally come in bush or pole variety, the bush variety generally producing fruits earlier but over a shorter season and the pole variety, although requiring trellising will produce later and over longer period of time. They like maturing in cool weather and will often not do well if it is too warm.

Transplants: The legume family is overwhelmingly good for your garden as members of this family are able to fix nitrogen, replenishing this essential nutrient into your soil. Planting legumes after a crop that has high nutrient requirements is always a good idea.

Irrigation: Legumes are very sensitive to overwatering and will not do well in any water logged ground. It is possible to either provide them with raised beds for increased drainage or mix some sand into the soil to facilitate drainage. The roots only extend about 18" so they can be affected by drought, especially when they are flowering. You can also add mulch around the base of the newly germinated plants to hold in moisture and keep out weeds.

Pests: Potato leafhopper

Pest Management: "Tendercrop" and "Tenderette" are good bean varieties to grow if you have problems with the potato leafhopper.

Post-harvest handling: Beans: Snap beans are ready for harvest a week or two after flowering (6-8 weeks after planting). Once the harvest begins, pick your beans every two or three days. For dry beans, let the pods stay on the plants until the beans are large and hard and the pods are dry and papery. Once the pods are dry you can shell the dry beans. Peas: Generally ready for picking 20-30 days after blooming. It is important to harvest them before they become overmature, otherwise they will lose their sweetness.

The Solanaceae Family - The Nightshades

Solanum tuberosum, Lycopersicon esculentum, Capsicum annuum, S. mel---

Crops: potatoes, tomatoes, peppers, and eggplant

Soils: Loose, deep soil with good drainage and healthy amounts of organic matter. Peppers are sensitive to low nitrogen and phosphorus levels. Potatoes especially need loose soil for the tubers to form.

Starts: Most Solanums (except potatoes) are started indoors. Tomatoes: They need warm soil to germinate well but prefer cooler nighttime temperatures. Air temperature of 70°-75°F during the day and 50°-55°F during the night is ideal. Peppers: Cool nights facilitate branching and therefore fruiting, but also slow growth.

Transplants: After transplanting, they do well if mulched and protected by row covers, especially in cool climates. Potatoes especially require mulch as the tubers are light sensitive. However, potatoes prefer cooler soils than peppers or tomatoes. Keep the gardens weed free as they are very sensitive to competition.

Irrigation: Tomatoes: Most roots remain 12"-18" inches and are quite efficient at water uptake, so keep them moist, but do not overdo the watering. Peppers: Are also very efficient at water uptake but need more water than tomatoes and will wilt before the tomatoes. Potatoes: Need plenty of water when the tubers are forming and need it on a regular schedule, otherwise misshapen potatoes will form. Soil should be kept moist from the time flower buds appear to when the foliage dies.

Pests: Tomato hornworm, pepper maggots/weevils, tobacco mosaic virus, Colorado potato beetle

Pest Management: These are larger pests, so it is easier to pick them off by hand. *Bt* spray also works well (see *Brassica* description). Talcum powder can be sprinkled on pepper plants during the egg laying season of the yellow fly, the eggs of whom become the destructive larva. If you use tobacco products, be sure to wash your hands thoroughly before touching Solanums. You can pass along the tobacco mosaic virus by touching the plants and causing their leaves to yellow and curl. Pick Colorado Potato Beetles off by hand and look for their bright orange eggs on the undersides of leaves and squash them!

Post-harvest handling: Tomatoes: Harvest when ripe. If harvested on the vine, the fruits carry higher levels of Vitamin C and sugars. Tomatoes will continue to ripen off the vine and fruits that have already turned green will eventually ripen to red if stored properly. Always store fruits above 54°F. Temperatures lower than this will damage the fruits. Peppers: Also, harvest when ripe and like tomatoes, will continue to ripen after harvest if stored in an unheated place. Potatoes: New potatoes can be dug anytime but storage potatoes should be dug two weeks after the tops have died down. This toughens the skins and converts sugars to starches, making them better for storage. Dig them up with a fork (immediately eating any speared potatoes!) and let them dry outside for several hours. Be careful not to break the skins. Ideal storage is high humidity (95%) and cool temperatures (40°-50°F) and should be stored out of the light.

Activity One: Farm Mapping and Crop Rotation.

The class will split into 3 groups. Groups will map out where they might locate different crops such as potatoes, carrots, zucchini, mustard greens, and lettuce based on irrigation needs, nutrient requirements, water needs, and pest control. You should physically draw the map and be prepared to show the rest of the class. After this activity, you will be able to make your own farm map as part of your business plan.

[illegible]

III. Crop Planning

Crop planning will set the foundation for writing the physical aspects of your business plan. When you plan your crops, you determine what kinds of materials you need to buy, when you need to do the work, and when you will be making money. Crop planning is an important exercise that will eventually help you complete your expenses sheet, cash flow sheet, operations plan and marketing plan.



New Entry presents:
Production Planning

What is production planning?



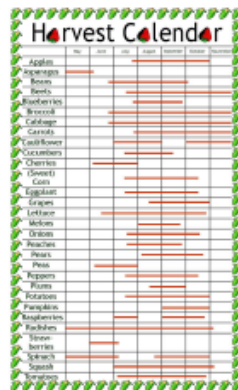
Why is it important to plan your production?



The New Entry 11 step process:

1. Cropping and succession timetable.
2. Decide how much you need to produce per week.
3. How much do you need to produce per season in total?
4. How many row feet will it take to produce that much?
5. How many bed feet will this take up?
6. How often do you need to plant this crop/enterprise?
7. How many times during the season do you need to plant this crop?
8. How often do you need to plant this crop/enterprise?
9. How many plants and/or seeds will you need for the whole season?
10. What other materials and supplies will you need?
11. Where will you plant this crop?

STEP 1:
Cropping and
succession
timetable:
how many weeks
can you possibly
harvest each
enterprise?



20 HEADS FOR
15 WEEKS= 300
HEADS PLUS
CULL

y Sustainable Farming Project, Farm Business Course

STEP 4:

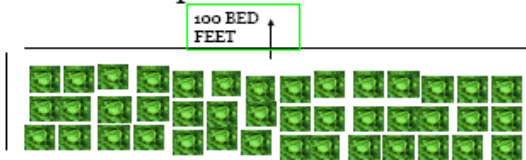
How many row feet will it take to produce that much?



THE SPACING FOR LETTUCE IS 12" BETWEEN PLANTS IN ROW. ONE PLANT PER FOOT.

STEP 5:

How many bed feet will this take up?



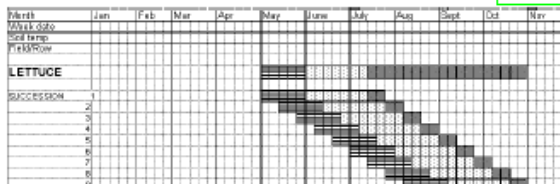
LETTUCE IS SPACED 12" X 12". YOU CAN FIT 3 ROWS IN A BED. IF YOU NEED 300 ROW FEET IN TOTAL, YOU WOULD ONLY NEED 100 BED FEET TO PRODUCE 300 HEADS.

STEP 6:

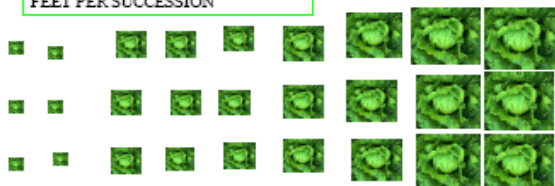
How often do you need to plant this crop/enterprise?
(See: "successions")

EVERY 2 WEEKS

How many times
during the season do you
need to plant this crop? 9



How much space do you need in each succession?



How many plants and/or seeds will you need

360 SEEDS FOR THE SEASON



Step 10: What other materials and supplies will you need?



STEP 11:
Where will you plant this crop?

YOUR MAP HERE



Crop Name	Day to Maturity	1st planting	NESFP seed/set	Last seed date	Successions	Harvest period	Plant/seed spacing	Seeding rate	Seeds per ounce	Yield/100'	D/T
Amaranth	50		early June	early Aug	2-3 weeks	2 weeks	6"x6"	12s/ft	47,000		d
Basil	75	Late May	early June	mid July	2-3 weeks	continual	6"x6"	5s/ft	16,00 Ave		d/t
Beans, Dry	75	Late May	early/mid June	N/A	N/A	once	2"x20-36"	8s/ft	varies	8#	d
Beans, Green	53	Late May	early/mid June	20-Aug	1-2 weeks	7-10 days	2"x20-36"	8s/ft	88	80#	d
Beans, Long	85	Late May	early/mid June	16-Jul	1-2 weeks	2-3 weeks	3"x4'	4s/ft	238	150#	d
Beets	50	Mid April	mid May	20-Aug	2-4 weeks	2-3 weeks	1"x12"	10s/ft	2,200	100#	d
Broccoli	60		Trans.(4 wk. old) in mid April and late July			once/head	8"x18"	2-3 s/ft	6,000 Ave	75#	t
Brussels Sprouts	100		Transplant in mid June at 6 weeks old			once/2-3 week	18"x30"	12s/ft	7,000Ave	60#	t
Cabbage	60-95		Trans. (4 wks old) in mid Apr. and early July			once	18"x24"	2s/ft	7,000 Ave	150#	t
Carrots	54-75		Mid April	mid July	1-2 weeks	continual	1"x18"	30s/ft	18,000	100#	d
Cauliflower	Ave 60		Trans. (4 wks old) in mid Apr. and early July			once	18"x24"	2s/ft	8,000	90#	t
Celery	80		Sow in early March, trans in earl June			once	6"x24"	6s/inch	50,500 Ave	100 heads	t
Chinese Cabbage	48	Mid April	late May	Late July	2-3 weeks	3-4 weeks	12"x18"	3s/ft	9,375 Ave		d
Cilantro		Early May	May	Late July	1-3 weeks	continual	6"x6"	2s/ft	3,000 Ave		d
Collards	55	Mid April	Mid May	N/A	N/A	continual	8"x18"	5s/ft	7,000 Ave	75#	d
Cucumbers	Ave 55	Ealy June	mid June	Late July	2 weeks	1-2 weeks	8"x5-6'	6s/ft	1,063 Ave	120#	d/t
Eggplant	Ave 70	Mid/Late May	Mid June	N/A	N/A	fruit to frost	18"x30"	3,500 pl./oz	6,000 Ave	75#	t
Gourds, Bitter Melon	66		Mid June	mid July	2 weeks	1-2 weeks	12"x5-6'	1s/ft	2,200 Ave		d/t
Greens, Arugula	40	Early April	early May	late Aug	3 weeks	1-3 weeks	1"x18"	30s/ft	15,000		d
Greens, Bok Choi	45	Early April	early May	20-Aug	1-2 weeks	1-2 weeks	6"x6"	5s/ft	12,500 Ave		d/t
Greens, Mustard	42	Early April	early May	20-Aug	1-2 weeks	1-2 weeks	rows 24"	15s/ft	12,500 Ave	100#	d
Greens, Salad Mix	25	Early April	early May	20-Aug	1-2 weeks	1-2 weeks	rows 18"	15s/ft	12,500 Ave		d
Kale	55		ealy July	N/A	N/A	continual	8"x18"	5s/ft	7,000 Ave	75#	d
Lettuce	Ave 50		late April	late Aug	1-2 weeks	1-2 weeks	12"x18"	4s/ft	24,000 Ave	50#	d/t
Mo Mein											
Okra	50		early June	N/A	N/A	fruit to frost	12"x2-3'	6s/ft	467		d
Onions, Bulbiing	100	Early April	late April	N/A	N/A	bumper	4"x18"	24s/ft	656	100#	d/t
Onions, Bunching	62	Early April	late April	20-Aug	2-3 weeks	2-3 weeks	1/2"x6"	50s/ft	12,500	100#	d
Parsley						continual	12"x18"	2s/ft			d
Peas, Fruit	60		august		2 plantings	1-2 weeks	12"x18"	25s/ft	125		d
Peas, Greens	32		early April	late Aug	3 weeks	continual	rows 12"	25s/ft	125		d
Peppers, Hot	60 G, 90 R		late May	N/A	N/A	fruit to frost	12"x24"	3,000pl./oz	4,000 Ave	50#	t
Peppers, Sweet	60 G, 90 R		late May	N/A	N/A	fruit to frost	12"x24"	3,000pl./oz	4,000 Ave	50#	t
Potatoes, Greens	30-45 days	April/May	Transplant when the soil is warm			continual	12"x24"				
Radishes	20-50	Early April	early May	late Aug	1 week	4-5 days	rows 6"	35s/ft	2,500 Ave	100 bunches	d
Spinach	35		early April	Late July	I Spring, I Fall	depends on heat	rows 18"	40s/ft	2,200 Ave	40#	d
Squash, Summer	Ave 50	Late May	early June	Late July	2-3 weeks	3-4 weeks	12"x6'	2s/ft	3,000-4,500	200#	d
Squash, Winter	Ave 100		early/mid June	N/A	N/A	bumper	3'x6'	2s/ft	varies	200#	d
Swiss Chard	55	Late April	mid May	20-Aug	3-4 weeks	3-4 weeks	rows 18"	6s/ft	1,875		d
Tomatillo	70		late May	N/A	N/A	fruit to frost	2'x4-6'	850pl/1,000sc	8,540 Ave		t
Tomato	Ave 70	Mid May (w/cover)	late May	N/A	N/A	fruit to frost	2'x4-6'	850pl/1,000sc	8,750 Ave	150#	t

Crop Name	Material	Use	How much do you need?	Average Price	Your Cost	Store Name	Store Name	Store Name
Amaranth	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
Basil	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
Beans, Dry	Row cover, light	Insect control	bed feet=	varies widely	\$	Brookdale	Griffin	NOFA
Beans, Green	Row cover, light	Insect control	bed feet=	varies widely	\$	Brookdale	Griffin	NOFA
Beans, Long	Field stakes	Helps beans climb	1 stake/4 row'	.30c ea	\$	Brookdale		4s/ft
	Trellis twine	Helps beans climb	1.25'/1 row'	\$5.00/roll	\$	Brookdale		
Broccoli	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
	Row cover, light	Insect control	bed feet=	varies widely	\$	Brookdale	Griffin	NOFA
Brussels Sprouts	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
Cabbage	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
	Row cover, light	Insect control	bed feet=	varies widely	\$	Brookdale	Griffin	NOFA
Cauliflower	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$			
	Row cover, light	Insect control	bed feet=	varies widely	\$	Brookdale	Griffin	NOFA
Collards	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
Cucumbers	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
Eggplant	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
Gourds, Bitter Melon	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
	Trellis materials				\$	Brookdale		
Greens, Arugula	Row cover, light	Insect control	bed feet=	varies widely	\$	Brookdale	Griffin	NOFA
Greens, Bok Choi	Row cover, light	Insect control	bed feet=	varies widely	\$	Brookdale	Griffin	NOFA
	Black Plastic	Weed control	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
Greens, Mustard	Row cover, light	Insect control	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	NOFA
Lettuce	Black Plastic	Weed control	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
Mo Mein	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
Okra	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
Onions, Bulbiing	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
Onions, Bunching	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
Peppers, All	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
	Row cover, heavy	Frost/cold protection	bed feet=	varies widely	\$	Brookdale	Griffin	NOFA
	Metal hoops	Helps cover to stay off crop	one every 3-4'	\$56-\$100/100 ct.	\$	Griffiin	NOFA	Johnny's
Potatoes, Greens	Row cover	Insect control	one every 3-4'	varies widely	\$	Brookdale	Griffin	NOFA
Radishes	Row cover, light	Insect control	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	NOFA
Squash, Summer	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
Squash, Winter	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
Tomatillo	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
Tomato	Black Plastic	Weed control, Soil warming	bed feet=	\$90-\$100 4'x2,000'	\$	Brookdale	Griffin	Dubois
	Field Stakes	Helps beans climb	1 stake/4 row'	.30c ea	\$	Brookdale		
	Twine	Helps hold tomatoes off ground	1.25'/1 row'	\$5.00/roll	\$	Brookdale		
	Row cover, heavy	Frost/cold protection	bed feet=	varies widely	\$	Brookdale	Griffin	NOFA
	Metal hoops	Helps cover to stay off crop	one every 3-4'	\$56-\$100/100 ct.	\$	Griffin	NOFA	Johnny's

**In addition to the above materials, all crops require water and food.

**Please consider fertility and irrigation in your farm plan: ask a TA provider to show you different options

Fertility: **Crop production services, NOFA bulk, Johnny's, Griffin Greenhouse

Irrigation: **Brookdale Fruit Farm, Dripworks, Griffin Greenhouse

**Pesticides: Prevention is the best method, but please consult a TA provider for help with pesticides.

For Office Use Only *Filed? Y/N*

Date and time of planning assistance:

[illegible]

Your steps to crop planning:

Business and crop plan pages:

1) Please fill in your cropping and successions timetable to see how many weeks you will have this crop.

Cropping and successions sheet

2) Decide how much you need to produce per week.

Market plan and income projection

3) See how much you need to produce per season in total.

Market plan and income projection

4) How many ROW FEET will it take to produce that much? (See "yield")

Crop map

5) How many beds will this take up? (See "spacing")

Crop map

4) How often do you need to plant this crop? (See "successions")

Field schedule, production plan

5) How many times during the season do you need to plant this crop?

Field schedule, production plan

6) How much space do you need to plant in each succession?

Field schedule, production plan

7) How many plants and/or seeds will you need for the whole season?

Startup budget

8) What other materials will you need for this crop? (See "materials worksheet")

Startup budget

9) Where will you plant this crop?

Crop map

NEXT STEPS

Complete cash flow and write your narratives!

Activity: *Crop Planning Exercise*

Please turn to the “Crop Planning Activity for Lettuce.” Complete the lettuce crop plan exercise by answering the attached questions. Feel free to work in pairs for this activity. We will discuss the answers as a class.

You want to sell 50 heads of lettuce at a farmers market every week in the summer. The farmers market starts on June 1 and ends on October 30. You know that the lettuce has to be grown in the greenhouse for 4 weeks before you plant it in your field.

You also know that when the lettuce has reached maturity, it will stay in your field for two weeks before it gets too old to sell.

1) What is a *succession planting*?

2) How many heads of lettuce will you need to harvest in each *succession*?

3) When should you plant your lettuce in the greenhouse if you need it to be ready for June 1?

4) When should you plant that lettuce in the field for it to be ready for June 1?

5) How many *successions* will you need to plant this year?

Make a schedule and then fill out your cropping sheet for one crop.

Sow	Transplant	Harvest

Seed Calculations Activity: Lettuce

You want to order your seed for all of your lettuce plantings. You know you want to plant more than one kind of lettuce. You know how many plants you want according to your first worksheet.

What is a *variety*?

What is the *spacing* of lettuce plants? How do you find this information?

How many seeds do you need to order for all of your *succession plantings*?

Where will you order these seeds?

How much will they cost?

BONUS: What is the total *BED feet and ROW feet* you will need for the lettuce?

Homework:

- 1) Start planning your enterprises using the worksheets and materials that are included in this section of your manual including:
 - i. Cropping and succession timeline
 - ii. Improved crop planning sheet
- 2) Start thinking about some of the field materials that might be needed for your enterprises by reviewing the materials spreadsheet.

Housekeeping:

- 1) Get ready for the marketing field trip!