Get more from your garden – maximizing yield

Start Early....Finish Late
Use floating row covers for protection against frosts in early spring and fall
- Invest in heavier fabric so that it can be re-used

Warm up your soil and plant earlier
- Use raised beds, which warm up faster and won’t get waterlogged with melting snow
- Cover garden beds with clear plastic for 1-2 weeks before planting for optimum heating

Plant cold-tolerant greens in a cold frame for early spring harvests, and again in fall for crops into November/December
- Adding bottles or jugs of water, painted black to absorb heat from the sun, will help moderate low overnight temperatures

Start with transplants to get a jump on the season (check varieties; some crops prefer to be direct seeded)
- Lettuce from transplants will yield large heads before summer heat sets in
- Larger transplants will better fend off insect attacks

Pre-soak or pre-sprout seeds for faster germination
- Seeds that germinate more reliably if pre-soaked in warm water for 24 hours prior to planting: beets, carrots, parsley, parsnips, spinach
- Seeds that germinate slowly in cool weather can be pre-sprouted at home in wet paper towels: peas, spinach, corn. Place the towels in a plastic bag and leave in a bright spot with no direct sunlight. Plant the seeds as soon as small roots emerge.

Use protective coverings for first few weeks in garden to get an early start on summer crops like tomatoes, peppers and eggplant
- Cut the bottom off of one-gallon milk jugs and use to cover small transplants at night
- Wall-o-waters are awkward to fill and handle but offer good protection; close up at night and open during sunny days. Place a few sturdy sticks inside to prevent them from tipping over.
- Enclose sides of tomato cages with dry cleaning bags, other lightweight plastic or row cover material; leave open at top and close up on cold nights to seal in heat

Plant varieties that can handle frosts for autumn harvest: kale and other greens, beets, radishes, turnips, broccoli, cauliflower, Asian and other cabbages

Succession Plant for Crops all Season
Plan garden so that as one crop is finished you immediately plant another in that space

Plant in mid-to-late summer the varieties you grow in early spring, for a fall harvest. Some crops grow better as days get cooler and insects are less numerous. Add extra time to maturity dates to account for waning sunlight.

Pick ripe fruits promptly so plants keep producing
Plant crops that have a short picking window every 2-3 weeks for a continuous supply all season
- Those that mature quickly: bush beans, heat-tolerant lettuces, dill, cilantro
- Crops you want to eat at a young stage: beets, carrots, kohlrabi

Grow early maturing varieties to squeeze in an extra crop during our short season

Interplant Crops for Best Use of Space
Grow fast-maturing plants between or around slower varieties: salad greens or radishes with green peppers or tomatoes, rows of radish or spinach that become space for zucchini to fill as it grows
Tuck shorter plants around larger ones: basil and other herbs or peppers with tomatoes
Use tall plants as supports for vining crops: corn or tall okra with pole beans or cucumbers
Plant Closely
*Plant in raised beds or very well loosened soil so roots grow down deep*

Plant crops in blocks rather than long rows to allow more flexibility in garden layout

**Trellis up and cage plants to conserve space**
- Direct rambling plants upward to create more growing space: cucumbers, melons, winter squash, zucchini, pumpkins, pole beans
- Contain plants that sprawl: tomatoes, tomatillos, bush and soy beans, raspberries

**Grow smaller, more compact varieties:** summer and winter squashes, cabbages, tomatoes

**Pay attention to sunlight and shade patterns**
- Grow taller crops on the north end of garden beds
- Don’t shade shorter sun-loving crops with tall varieties
- Plant shade-tolerant varieties on the north side of bed, or at base of taller crops

**Maintain good soil fertility** so plants are not competing for nutrients; add compost or side-dress with manure when succession planting

**Pick the Right Plants**

*Grow varieties that will continue to yield over a long period:* broccoli that provides side shoots all season once main head is picked, greens that re-grow after cutting

*Some vegetables may produce greater yields when grown in large pots:* peppers, eggplants

*Grow varieties of early vegetables that sprout in cool weather, and summer vegetables that will set fruit in high heat*

**Pay attention to maturity dates on long-season crops** – some varieties won’t mature in MN before frost

**Maximize your Growing Environment**

*Grow shade-tolerant crops in areas of less-than-ideal sun*
- Plants will need at least 3-6 hours of direct sun each day
- Leafy vegetables fare better under shady conditions

*Tuck ornamental vegetables into your home flower gardens:* kale, Swiss chard, lettuce, small-fruited peppers, eggplant, okra, small cabbages, runner beans, fennel, herbs, edible flowers

*Grow in pots where a garden is not possible but sunlight is good:* patio, porch or balcony, walkway, window box, roof
- Crops that will grow well in pots: bush beans, beets, carrots, cabbage, Swiss chard, cucumbers, leaf lettuce, sweet and hot peppers, small summer squashes, dwarf tomatoes, turnips, eggplant, kale
- Pots dry out much faster than gardens; check daily, especially in hot weather. Use potting soil amended with compost or manure, and fertilize during the growing season.

**Consider purchasing some crops instead of growing your own**
- Visit the farmer’s market for crops that use a lot of garden space: sweet corn, melons, winter squash
- Produce that’s relatively inexpensive to buy or hard to grow well: organic carrots and potatoes, celery

**Provide Optimal Growing Conditions**

*Add soil amendments or grow cover crops to increase soil fertility*
- Have your soil tested: contact soiltest@umn.edu or 612/625-3101 for directions on sending samples
- Compost kitchen and yard waste and apply to your garden; a 1-3” layer each year is recommended
- Information on improving soil and growing cover crops: dowlingcommunitygarden.org/pages/cover.htm

*Provide adequate water, about 1” per week*
- Mulch to retain moisture by adding 3-4” of organic mulch: shredded leaves, dry grass clippings, straw or compost

*Eliminate weeds so nutrients and moisture in soil go to your plants*

*Don’t compact growing areas by walking on garden beds*
- Create dedicated pathways and cover them with mulch (avoid wood chips as these may rob soil of nutrients as they decompose)

**Manage Insects and Diseases**

*Inspect crops frequently for signs of insects*
- Look under leaves and crush insect eggs and insects
- Information about sticky traps and cards: dowlingcommunitygarden.org/pages/insectDisease.htm

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**Shade-Tolerant Crops**
- Beans
- Beet
- Cabbage
- Carrot
- Celery
- Chinese cabbage
- Herbs: Cilantro, chives, mint
- Jerusalem artichoke
- Kale
- Parsley
- Peas
- Radish
- Scallion
- Spinach
- Squash
- Swiss chard
- Partly shady
- Arugula
- Broccoli
- Brussels sprouts
- Cauliflower
- Leek
- Lettuce
- Mustard greens

**Resources:**


*High-Yield Gardening: How to get more from your garden space and gardening season* by Marjorie Hunt and Brenda Bortz, Rodale Press, 1986.

*All New Square Foot Gardening* by Mel Bartholomew, Cool Springs Press, 2006.

*Four-Season Harvest: Organic Vegetables from Your Home Garden All Year Long* by Eliot Coleman, Chelsea Green, 1999.
Use insect barriers immediately upon planting (row covers) or just before insects appear (soap sprays)
- Try growing spinach and Swiss chard under row cover to prevent leaf miner damage
- Row covers used in spring are effective against flea beetles
- Non-toxic soap repellent sprays (apply in late afternoon or on a cloudy day; try on small part of plant first to test plant’s reaction) must be re-applied after each rain. They work better on soft-bodied insects and must come in contact with insect to be most effective.

Experiment with trap crops and companion planting. Some plants repel bad bugs or attract beneficial insects; trap crops lure insects away from your desirable planting

Don’t put all crops of the same family in one spot – interplant to confuse insects and minimize damage

Know when insects cycles occur and plant crops when bugs are less of a problem
- Grow fall plantings of crops that get attacked by flea beetles in spring: arugula, radish, bok choy, kale
- Carefully time when you plant potatoes to minimize Colorado Potato Beetle infestations

Grow insect-resistant varieties
- More information: www.uwex.edu/ces/wihort/fruitveggies/VeggiePubs.htm

Clean up garden debris in the fall to prevent insects from overwintering
Remove diseased plants and foliage promptly, and throw away – do not compost
Practice crop rotation as best possible
Practice good garden sanitation
- Don’t handle plants when they are wet
- Disinfect tools, plant pots, garden structures at end of season

Use fewer resources – gardening on a budget

Grow Crops that are Expensive to Buy
Because of fragility or short shelf life: tomatoes, pea pods, green beans, lettuce and other salad greens, spinach, Swiss chard, kale, herbs, raspberries
Because they are uncommon or harder/more expensive to grow commercially: leeks, red onions, garlic, edamame, most all organic vegetables, unusual-colored varieties, heirloom varieties

Establish Perennial Food Crops
Plant these crops once and harvest for years: walking onion, asparagus, Jerusalem artichokes, sorrel, rhubarb, raspberries, strawberries, many herbs

Properly Store Vegetables for Longer Life
Grow long-keeping varieties for garden produce during winter months: onions, garlic, winter squash, cabbage, root vegetables (carrots, parsnips, turnips, rutabagas, beets), green tomatoes

Maintain proper moisture levels and temperatures

<table>
<thead>
<tr>
<th>Cool room temperature (55-70°)</th>
<th>Refrigerator (less than 45°)</th>
<th>Long term storage (32-40°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basil</td>
<td>Beans</td>
<td>Carrots</td>
</tr>
<tr>
<td>Tomatoes, ripe</td>
<td>Beets</td>
<td>7-9 months</td>
</tr>
<tr>
<td>Tomatoes, green</td>
<td>Broccoli</td>
<td>(high humidity)</td>
</tr>
<tr>
<td></td>
<td>Brussels Sprouts</td>
<td>10-14 days</td>
</tr>
<tr>
<td></td>
<td>Cabbage</td>
<td>(medium humidity)</td>
</tr>
<tr>
<td></td>
<td>Cauliflower</td>
<td>5-6 months</td>
</tr>
<tr>
<td></td>
<td>Lettuce</td>
<td>(depending on variety)</td>
</tr>
<tr>
<td></td>
<td>Kohlrabi</td>
<td>2-3 months</td>
</tr>
<tr>
<td></td>
<td>Leeks</td>
<td>2-3 months</td>
</tr>
<tr>
<td></td>
<td>Melons</td>
<td>5-14 days</td>
</tr>
<tr>
<td></td>
<td>Peas</td>
<td>1-2 weeks</td>
</tr>
<tr>
<td></td>
<td>Swiss chard</td>
<td>10-14 days</td>
</tr>
<tr>
<td>Cucumbers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eggplant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Okra</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peppers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pumpkin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summer Squash</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winter squash</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watermelon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cool (45-55°)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Resources: Insects & Diseases

Most Productive Garden Vegetables
- Beans, bush
- Broccoli
- Carrots
- Cucumbers
- Lettuce
- Garlic
- Onions
- Peas, snow & snap
- Peppers, sweet & hot
- Spinach
- Summer squash
- Tomatoes

(From an online survey of over 900 respondents conducted by Mother Earth News)
Preserve Your Harvest

Freezing best bets: beans, broccoli, corn, peas, raw peppers, spinach, greens, cooked or raw tomatoes, whole berries, herbs

Easiest to can: tomatoes, pickled vegetables, jams and preserves

Dehydrate: cherry and paste tomatoes, small hot peppers, herbs, fruit slices

More information on safely preserving food: extension.umn.edu/topics.html?topic=3&subtopic=35

Save your own Seeds

Start with easy varieties that mature in one season and are self-pollinating: tomatoes, peppers, eggplants, peas, beans, lettuce, okra

Resources: Seed to Seed: Seed Saving and Growing Techniques for Vegetable Gardeners by Suzanne Ashworth (Seed Savers Exchange, 2002) or dowlingcommunitygarden.org/pages/seedSav.htm

Let crops mature to re-seed on their own

- Dill, cilantro, lettuce (but beware offspring may not be identical to parent)

Grow from Seed instead of Buying Plants

Grow specific varieties that will do best in your garden, and grow exactly the quantities needed to have transplants at correct size when you want to plant them outdoors. Most seeds remain viable for years.

Resources: The New Seed Starter’s Handbook by Nancy Bubel (Rodale Books, 1988) or dowlingcommunitygarden.org/pages/seedStart.htm

Trade Seeds and Plants

Arrange a seed swap with other gardeners and friends

Trade seeds online through the gardening forums

- Visit GardenWeb’s seed exchange page: forums2.gardenweb.com/forums/exseed
- Register at Tomatoville to visit their seed swap pages: tomatoville.com/index.php

Attend local plant swaps hosted by garden clubs, or plan one with your neighbors

Conserve Water

Keep track of rainfall amounts with a rain gauge, and water only when necessary

- Gardens generally need 1” of water per week; test your soil for moisture before you water
- Early morning or late afternoon is best; avoid watering in mid-day sun or evening when plants will not dry off

Apply a thick layer of organic mulch to your garden and water less. Mulch keeps soil cooler in hot weather and cuts down on evaporation

Add organic materials like compost and manure to increase your soil’s moisture-holding ability

Group plants together that need more water and spot water to avoid wetting entire garden

Recycle Garden Materials

Clean and re-use plastic pots, seed-starting cell packs

- Sterilize seed-starting pots in a solution of 1 part bleach/9 parts water or full-strength 3% hydrogen peroxide to prevent diseases; rinse thoroughly after soaking
- Make plant tags: cut up white plastic containers from yogurt and dairy products

Grow vegetables in large tubs from shrubs and trees

Look for creative trellis materials in others’ discards: old ladders, interesting industrial metal uprights, buckthorn and other tree trimmings, scrap lumber, fence pieces, decorative window frames, furniture such as bed headboards and folding screens

Look for free garden materials online, and post your no-longer-needed items

- Locally: www.twincitiesfreemarket.org or www.freecycle.org/group/US/Minnesota/Minneapolis (Hennepin County)

Invest in Quality Materials

Buy well-made tools and care for them responsibly. You should only need to buy a tool once or twice in a lifetime. Purchase tools that can be repaired or have parts replaced. Sharpen tools yourself.

- Ask other gardeners what brands/styles have held up to years of use
- Buy tools at estate or garage sales; many older tools contain better quality materials or workmanship
- Clean tools after use and store them in a dry place
- Consider sharing seldom-used tools with a gardening friend or neighbor
## 2005 Garden Yield

*All produce grown organically. Yield units and prices based on comparable local produce for sale at time of harvest.*

<table>
<thead>
<tr>
<th>Crop</th>
<th>Yield</th>
<th>Cost to Purchase</th>
<th>Crop Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swiss chard (bunches)</td>
<td>15</td>
<td>($1.70/bunch)</td>
<td>$ 25.50</td>
</tr>
<tr>
<td>Kale (bunches)</td>
<td>17</td>
<td>($1.70/bunch)</td>
<td>$ 28.90</td>
</tr>
<tr>
<td>Hot peppers</td>
<td>0.25 lbs. dried</td>
<td>($10/lb. dried)</td>
<td>$ 2.50</td>
</tr>
<tr>
<td>Sweet peppers</td>
<td>5.625 lbs.</td>
<td>($2.20/lb)</td>
<td>$ 12.35</td>
</tr>
<tr>
<td>Radishes (bunches)</td>
<td>11</td>
<td>($1/bunch)</td>
<td>$ 11.00</td>
</tr>
<tr>
<td>Spinach (bunches)</td>
<td>7</td>
<td>($1.80/bunch)</td>
<td>$ 12.60</td>
</tr>
<tr>
<td>Lettuce (heads)</td>
<td>18</td>
<td>($2/head)</td>
<td>$ 36.00</td>
</tr>
<tr>
<td>Arugula (bunches)</td>
<td>5</td>
<td>(unknown – guess)</td>
<td>$ 10.00</td>
</tr>
<tr>
<td>Bok choy (heads+lbs)</td>
<td>8 heads + 4.5 lbs.</td>
<td>($2.70/head + $1.59/lb)</td>
<td>$ 28.75</td>
</tr>
<tr>
<td>Broccoli</td>
<td>8.5 lbs.</td>
<td>($2.80/lb)</td>
<td>$ 23.80</td>
</tr>
<tr>
<td>Snow peas</td>
<td>4.875 lbs.</td>
<td>($4.50/lb)</td>
<td>$ 21.90</td>
</tr>
<tr>
<td>Sugar snap peas</td>
<td>5.875 lbs.</td>
<td>($4.50/lb)</td>
<td>$ 26.40</td>
</tr>
<tr>
<td>Asian eggplant</td>
<td>13.625 lbs.</td>
<td>($2.50/lb)</td>
<td>$ 34.00</td>
</tr>
<tr>
<td>Cauliflower (heads)</td>
<td>4 sm / 2 med / 2 ex large</td>
<td>($3.50 med. head organic)</td>
<td>$ 25.00</td>
</tr>
<tr>
<td>Zucchini</td>
<td>59.5 lbs.</td>
<td>($2/lb)</td>
<td>$ 119.00</td>
</tr>
<tr>
<td>Green beans</td>
<td>12.25 lbs.</td>
<td>(2.25/lb – est)</td>
<td>$ 27.55</td>
</tr>
<tr>
<td>Tomatoes-heirloom</td>
<td>244.375 lbs.</td>
<td>(avg. $2.50/lb)</td>
<td>$ 610.00</td>
</tr>
<tr>
<td>Cabbage</td>
<td>4 lbs.</td>
<td>($0.90/lb)</td>
<td>$ 3.60</td>
</tr>
<tr>
<td>Onions-yellow</td>
<td>50.5 lbs.</td>
<td>($1/lb)</td>
<td>$ 50.00</td>
</tr>
<tr>
<td>Onions-red</td>
<td>4.75 lbs.</td>
<td>($1.50/lb)</td>
<td>$ 7.10</td>
</tr>
<tr>
<td>Garlic</td>
<td>34 heads/5.5 lbs.</td>
<td>($2.60/lb)</td>
<td>$ 14.30</td>
</tr>
<tr>
<td>Leeks</td>
<td>8 lbs.</td>
<td>($1.75/lb)</td>
<td>$ 14.00</td>
</tr>
<tr>
<td>Beets</td>
<td>8.75 lbs.</td>
<td>($2/lb)</td>
<td>$ 17.40</td>
</tr>
<tr>
<td>Carrots</td>
<td>1 lb.</td>
<td>($1/lb)</td>
<td>$ 1.00</td>
</tr>
<tr>
<td>Soybeans-fresh</td>
<td>4.375 lbs.</td>
<td>($4.89/lb)</td>
<td>$ 21.40</td>
</tr>
<tr>
<td>Rhubarb (large bunches)</td>
<td>6</td>
<td>(unknown – guess)</td>
<td>$ 15.00</td>
</tr>
<tr>
<td>Grapes-for jam</td>
<td>19.75 lbs.</td>
<td>(?) - not available in stores</td>
<td>$</td>
</tr>
<tr>
<td>Raspberries (quarts)</td>
<td>10</td>
<td>($4/pint)</td>
<td>$ 80.00</td>
</tr>
<tr>
<td>Cilantro (bunches)</td>
<td>7</td>
<td>($0.80/bunch)</td>
<td>$ 5.60</td>
</tr>
<tr>
<td>Dill (bunches)</td>
<td>2</td>
<td>($2.40/bunch)</td>
<td>$ 4.80</td>
</tr>
<tr>
<td>Basil (bunches)</td>
<td>42</td>
<td>($2.40/bunch)</td>
<td>$ 100.80</td>
</tr>
<tr>
<td>Parsley (bunches)</td>
<td>5</td>
<td>($0.80/bunch)</td>
<td>$ 4.00</td>
</tr>
<tr>
<td>Rosemary (bunches)</td>
<td>6</td>
<td>($2.40/bunch)</td>
<td>$ 14.40</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Garden expenses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manure</td>
<td>$ 30.00</td>
</tr>
<tr>
<td>Other fertilizers</td>
<td>$ 20.00</td>
</tr>
<tr>
<td>Seeds and plants (guess)</td>
<td>$ 85.00</td>
</tr>
<tr>
<td>Potting soil</td>
<td>$ 25.50</td>
</tr>
<tr>
<td>Electricity and water (guess)</td>
<td>$ 35.00</td>
</tr>
<tr>
<td>Pots and supports</td>
<td>$ 36.00</td>
</tr>
<tr>
<td>Garden plot rental</td>
<td>$ 22.00</td>
</tr>
</tbody>
</table>

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| value of food grown | $ 1408.65 |
| less expenses       | – $ 253.50 |

**Total value of garden produce**  
$ 1155.15
Garden size is 20' x 40'. Photo shows garden before planting; garden plan shows planting arrangement in 2005.