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Best Vegetables for Northern NM

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NM Growing Zones

- **Area 1** (USDA 8a & 8b):
  Las Cruces, Lordsburg, Hobbs
- **Area 2** (USDA 7a & 7b):
  Albuquerque, Santa Fe, Roswell
- **Area 3** (USDA 6a & 6b):
  Farmington, Los Alamos, Taos

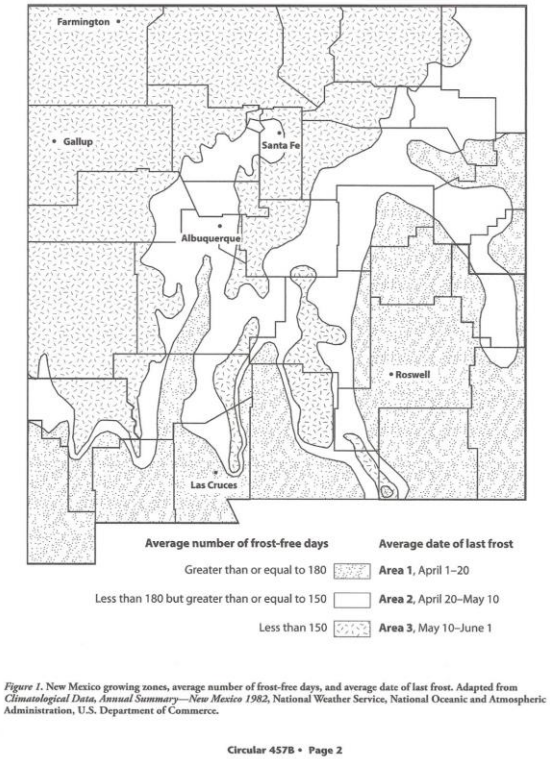


Figure 1. New Mexico growing zones, average number of frost-free days, and average date of last frost. Adapted from *Climatological Data, Annual Summary—New Mexico 1982*, National Weather Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

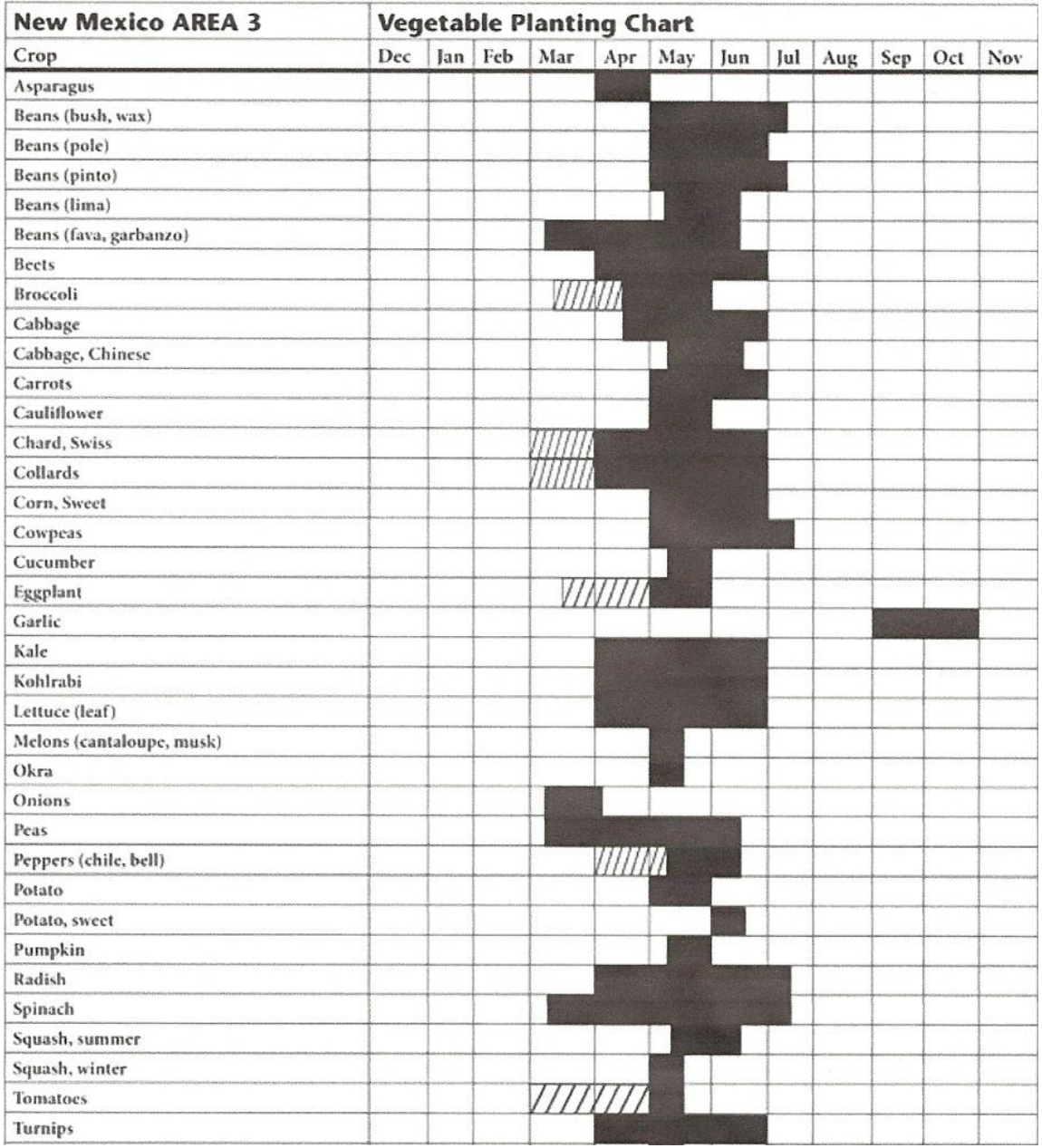
Circular 457B • Page 2

- Growing Zones, Recommended Crop Varieties, and Planting and Harvesting Information for Home Vegetable Gardens in New Mexico
  http://aces.nmsu.edu/pubs/_circulars/CR457B.pdf

NM Area 3

Best Planting Windows (USDA 6a & 6b)

-Farmington,
Los Alamos, Taos



Season Extension

- Vegetable season can be extended by providing protection to plants

  -Transplants

  -Microclimates

  -Mulching

  -Row Covers

  -Hoop Houses

  -Cold Frames

  -Greenhouses

Warm vs. Cool Season Vegetables

- **Warm season crops** include:
  - Squash, tomatoes, eggplant, okra, cucumber, beans, chile, bell peppers

- **Cool season crops** include:
  - Broccoli, carrots, spinach, lettuce, chard, kale, onions, beets, radishes

Warm-Season Vegetables

- Damaged by frost and killed by freezing temperatures
- Seeds germinate at warmer soil temperatures
- Thrive in warm temperatures, although growth may slow at very high temperatures (>90^{o}F)
- Fruiting warm season vegetables may be indeterminate or determinate

Sweet Corn (*Zea mays*)

- Annual; member of grass family
- Monocots
- Plant sequentially every two weeks to prolong harvest
- Plant first crop approx. one week before average last frost
- Plant last crop about 80 days before first frost in fall
- Consider time to maturity for different varieties

Sweet Corn

- Wind pollinated
  - poor pollination causes skips on cob
  - Plant in short, side-by-side rows
- Pollen source affects kernel quality; use care when planting more than one variety at the same time
- Germination
  -quick in warm soil (68-77^{o}F)
  -much slower in cool soil (50-55^{o}F)

Sweet Corn

- Regular Sweet Hybrids:
  -Traditional sweet corn taste
  -Performs better in cool soil

- Super Sweet:
  -Struggles in cool soil
  -Must be isolated (200 ft distance, or 14 days planting time)

Sweet Corn Cultivars

- ‘Merit’
- ‘Early Sunglow’
- ‘Hybrid Double Delicious’
- ‘Early Xtra-Sweet’
- ‘How Sweet It Is’

Tomatoes (*Solanum lycopersicum*)

- Most popular vegetable for home gardens; 93% of gardens include tomatoes
- Member of the Nightshade Family (Solanaceae) that also includes Eggplant, Peppers, and Potatoes
- Botanically classified as fruit (developed from an ovary), but officially recognized and treated as a vegetable (US Supreme Court ruling in 1893)
- Sensitive to frost; grown as a warm season annual

Vine Types

- **Determinate**: Bush-type, dwarf
  -Typically do not need caging or trellising
  -Best for container gardening
  -Tend to set fruit at same time & exhibit earlier maturity
- **Indeterminate**: Vining, pole-type
  -Benefit from staking, caging or trellising
  -Tend to set fruit over long period & have higher overall yields
  -Includes most cherry types

Tomato Fertilization

- Tomatoes are classified as heavy-feeders
- High requirements for potassium, calcium and iron
- Moderate requirements for nitrogen, magnesium, phosphorus, sulfur, boron, copper, manganese and zinc
- At soil pH > 7, micronutrient deficiency often occurs (esp. zinc, manganese and iron)

Tomato Fertilization

- Excessive N fertilization before fruit set may inhibit fruit development
- Fertilizers specific for tomatoes are available:
  8-32-16
  6-24-24

Micronutrient deficiency symptoms

Tomato Planting

- Direct seed or transplant
- Transplants preferred for earlier harvest
- Plant outside after last frost
- Plants should be placed or thinned to 12-24” spacing

Planting - Transplants

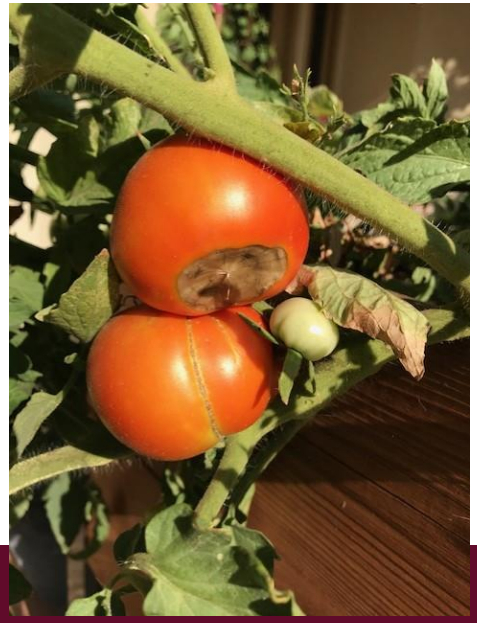
- **When to start**
  - Approx. 8 weeks before first frost free day
  - Start in clean potting soil or peat pots
  - Start by warm, sunny window
- **Harden-off seedlings to minimize transplanting shock**
  - Place outside in area partially protected from wind and sun for 1-2 weeks
  - Keep soil moist
  - Bring seedlings inside if freezing temperatures are predicted

“Trenching-in” long stemmed plants

-Encourages adventitious root development

Disorders: Blossom End Rot

- Affects many vegetable & fruit crops
- Abiotic disorder
- Caused by stressful conditions (heat, drought) during fruit set



Tomato Cultivars

- Plum and Small Types
  - Smaller (½” dia.)
  - Sweeter tomatoes
  - ~100 fruit/plant

  - ‘Sweet 100’
  - ‘Yellow Pear’
  - ‘Black Cherry’
  - ‘Tiny Tim’
  - ‘Red Cherry’

Tomato Cultivars

- Beefsteak
  - Larger tomatoes
  - Excellent for fresh use
  - ‘Beefmaster VFN’
  - ‘Celebrity VFFNT hybrid’
  - ‘Better Boy VFN’
  - ‘Early Girl’

Tomato Cultivars

- Paste
  - High ratio of solids
  - Excellent for sauces

  - ‘Roma VF’
  - ‘Viva Italia Hybrid’
  - ‘Amish Paste’

Tomato Cultivars

- Heirlooms
  - Older varieties
  - Open-pollinated
  - ‘Brandywine’
  - ‘Black Krim’
  - ‘Hungarian Heart’

Disorders: Splitting Fruit

- Once fruit reaches mature color epidermis cannot expand
- High water input will cause fruit to ‘split’
- Secondary fungal or bacterial pathogens quickly infect ‘split’ fruit

Disorders: Poor Fruit Set

- Insect or disease pressure
- Temps < 50° & > 95° F will prevent pollination and cause blossom drop
- Excessive nitrogen fertility will cause vigorous foliage but low fruit set (all leaves, no fruit)

Cool-Season Vegetables

- Highly or somewhat frost tolerant
- Seeds germinate at cool soil temperatures
- Tend to have shallow root systems
- Greater response to N and P application
- Most provide poor quality if maturing in high temperatures
- Bolting (seed stalk development) may be a concern

Bolting

- Development of a seed stalk, or premature production of seed in a vegetable crop
- Many vegetable crops become unusable after bolting
- Triggered by:
  -a cold spell (vernalization) or
  -changes in day length (photoperiod)

Bolting

- Annual crops sensitive to photoperiod: lettuce, radish, and spinach
  - -May bolt when day length increases
- Biennial crops sensitive to vernalization: onions, leeks, carrots, beets
  - -Produce large storage organ during 1st year in preparation for seed the 2nd year
  - -May bolt with uneven temps early in season

Bolting Prevention

- Once triggered, the bolting process can’t be stopped
- Delay planting until temperatures are more stable for cold-sensitive crops (ie. turnips, Swiss chard)
- Plant in optimum window for your area
- Plant ‘bolting resistant’ varieties

Allium Family (*Allioideae*)

- Onions
- Garlic
- Leeks

- Monocots

Onion / Garlic Culture

- Tolerant to frost or light freeze
- Shallow roots; water frequently
- Control weeds; *Alliums* don't compete well

Onion Culture

- Day length critical to bulb formation:
  - **Short-day**: require 10-12 hours
  - **Intermediate-day**: require 12-14 hours
  - **Long-day**: require more than 14 hours

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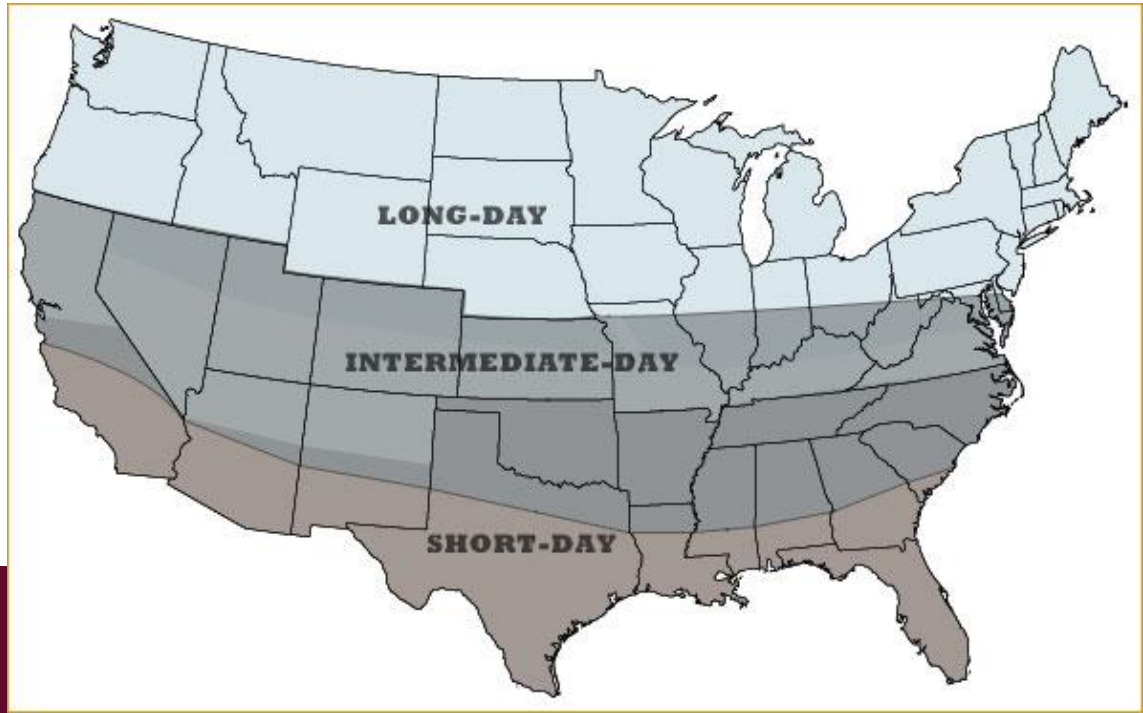

Onion Culture – Day Length

- **Short-day**: Bulbing begins early
  -If planted in the north, will produce small bulbs

- **Intermediate-day**: Most widely adapted

- **Long-day**: Includes most high solid cultivars
  -If planted in the south, may not form bulbs

Onion Culture

- Harvest
  - May through August
  - Depends on variety
  - Seed vs. transplants
- Harvest when leaves begin to turn yellow and lodge
- Bolting may occur with cool spring temps
  -Plant resistant varieties

Garlic (*Allium sativum*)

- Two main types: Softneck and Hardneck
- **Softneck** most common in southern NM
  -strong garlic flavor
  -best for storage

- **Hardneck** (*var. ophioscorodon*)
  -more cold tolerant varieties
  -produces hard scape that forms a cluster of mini-cloves (bulbils)

Garlic Planting

- Each set (mature bulb) is made up of several sections called cloves
- Bulbs used for planting should be stored in cool temps (40-50^{o}F) for several months
- Break cloves apart and plant, roots down 4-6” apart in rows 1.5 - 2’ apart
- Cover with 1-2” of fine soil

Garlic Harvest

- Late summer: bend over tops to hasten yellowing and drying of tops
- Pull up plants and allow to sun dry several hours
- Spread out in a well-ventilated place until tops are thoroughly dry (2-3 weeks)
- Cut tops off 1-2” above bulb
- Store in a cool, dry, well-ventilated area

Sunflower Family (*Asteraceae*)

- Lettuce

Lettuce (*Lactuca sativa)*

- Herbaceous annual
- Four types:
  -Leaf
  -Crisp head
  -Butterhead
  -Romaine (Cos)

Lettuce Culture

- Plant head lettuce in succession to prolong harvest
- Begin leaf lettuce harvest approx. 30-45 days after planting
- Leaf lettuce harvest can be extended by harvesting outer leaves

- Best germination at cool soil temperature (down to 35^{o}F); poor germ above 80^{o}F

Lettuce Culture

- Provide covering to protect from freezing temperatures
- Temperatures above 70°F with long days cause lettuce to bolt
- High temperatures and excess maturity cause bitterness

Parsley Family (*Umbelliferae*)

- Carrots
- Celery
- Parsley

Carrots

(Daucus carota var. *sativus)*

- Family Apiaceae (Umbelliferae)
- Biennial, grown as an annual
- White, purple, yellow, orange, and red varieties

Carrot Culture

- Best growth between 59 to 65°F
- Temperatures below 50°F decrease color development and growth
- Prolonged high temperatures cause strong flavor and coarse roots

Carrot Culture

- Heavy or rocky soil may prevent clean tap root development
- Carrot seedlings are salt sensitive; apply manure and fertilizer with care

Carrot Culture

- Boron and manganese may be needed on alkaline, sandy soils
- Potassium rarely needed due to high levels in NM soils

Carrots (*Daucus carota* var. *sativus)*

- Somewhat tolerant to frost
- Mulch heavily before freeze
- Harvest before a hard freeze

http://trends.move.com/wp-content/uploads/2008/01/carrots.jpg

Carrot Cultivars

- ‘Imperator’
- ‘Red Core Chantenay’
- ‘Danvers Half Long’
- ‘Nantes Coreless’

Goosefoot Family (*Chenopodiaceae*)

- Spinach
- Beets
- Chard

Spinach Culture

- Tolerant to frost or light freeze
- Prefers growing temperatures between 55-65°F
- Tends to bolt and develop bitter flavor when maturing in hot weather
- Harvest older leaves to prolong harvest

Beets – Chard (*Beta vulgarus*)

- Beets and chard closely related (main difference is larger chard plants need to be thinned 4-6” apart)

Beets (*Beta vulgarus*)

- Beet greens also nutritious portion of the crop
- Betanin is the pigment responsible for the red coloration of beet root
- White, yellow, pink and red varieties available

Swiss Chard

- Beautiful leafy vegetable in assorted colors
- 12-18” plant spacing
- Easier to grow than spinach
- Slower to bolt
- Frost improves flavor; bolting doesn’t hurt flavor as badly as with other cool season vegetables

Swiss Chard (*Beta vulgarus*)

- Begin harvest 50-60 days after planting
  -Remove outer leaves approx. 2” above soil line
  -Do not damage plant’s center bud so that plants can regenerate

Mustard Family (*Cruciferae*)

- Broccoli
- Cabbage
- Cauliflower
- Collards
- Kale
- Turnips
- Radish
- Mustard greens

Mustard Family (*Cruciferae*)

- Also known as brassica, cruciferous or cole crops
- Includes highly nutritious plants, grown for edible leaves, flowers, stems and roots
- Best germination in cool soil (45-65^{o}F), but will sprout up to 85^{o}F
- Poor quality if maturing in the heat (>85^{o}F); plan accordingly

Biofumigants

- Brassicas: Broccoli, cabbage, cauliflower, Brussels sprouts, kale & canola

- Produce isothiocyanates, compounds shown to reduce some soil pathogens

- Oilseed Radish

Radishes (*Raphanus sativus*)

- One of the easiest & quickest vegetable to grow
- 22-30 days from planting to harvest
- Great for intercropping with slower growing vegetables
- Varieties available in wide array of shapes and colors

Broccoli (*Brassica oleracea* var *italica)*

- Cool season annual
- Tolerant to frost or light freeze
- Grown for it's edible, immature flower head
- Relatively tolerant to environmental stress
- Best quality when planted to mature in cool weather

Broccoli Culture

- Temperatures below 40°F may cause chilling injury
- Harvest when heads are firm and florets haven't begun to open
- Cut sprouting broccoli just below the floret to stimulate new shoots

- Button heads due to temperature extremes or nitrogen deficiency

Broccoli Cultivars

- ‘Bonanza Hybrid’
- ‘Green Goliath’
- ‘Green Comet Hybrid’
- ‘Emperior’
- ‘Green Valient’
- ‘Premium Crop’
- ‘Hybrid Packman’

General Strategies for Gardeners

- Vigilance: Always stay on top of ‘current events’ in your garden
- Optimize soil and irrigation
- Provide proper nutrition
- Use high quality seed
- Use adapted varieties
- Plant at the correct time
- Harvest at the correct time
- Strategic crop rotation

Crop Rotation

- Avoid growing closely related vegetables in the same place two seasons in a row
- Minimum of four-year rotation preferred – keep records

- Benefits
  -Can break disease cycles
  -May reduce insect pests
  -Can be used to manage weeds
  -Serves to balance nutrient availability

NMSU Vegetable Resources

Growing zones, recommended crop varieties, and planting and harvesting information for home vegetable gardens in New Mexico:
http://aces.nmsu.edu/pubs/_circulars/circ457B.pdf

Or, for a complete list:
http://aces.nmsu.edu/pubs/_h/

Thank You!
Questions?

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