SEED TO SALAD



Vegetable Gardening

Jeff Raska
Dallas County Horticultural P.A.
Texas A&M AgriLife Extension

Where do I begin ???

Survey your property

Vegetables need at least 8 hours of full direct sunlight

Leafy greens may take a little less but the fruit producing plants require the max

The veggie garden needs to be close to a water source – vegetables require a consistent supply of water to produce

The garden needs to be placed in an area that drains well

Vegetables need WEED free beds to establish and grow well so plan the beds for ease of maintenance

A fertilization plan needs to be in place to optimize production and maintain plant health

Start small with just a couple of raised beds to see if it fits your family and place it close to your house if possible, to be sure to notice any problems quickly

GROW WHAT YOU LIKE TO EAT AND BE AWARE OF YOU SPACE LIMITATIONS

Prepare the soil correctly to give your garden a stable foundation





Amending the soil

Amend both sandy and clay soil with organic material

Compost in sandy soil help hold moisture and build the microbial populations needed to sustain the plants

Compost in clay soil help break up the clay to release the moisture and build the microbial populations needed to sustain plants

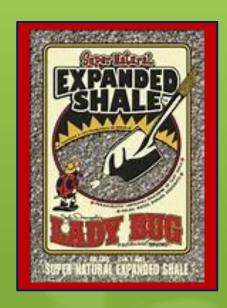
Expanded shale/clay buster helps break up the clay and allow oxygen deep into the root zone (also holds moisture)

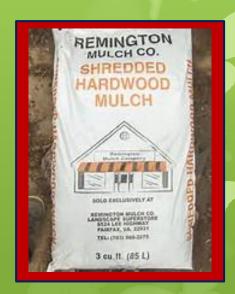
Loamy topsoil contains small amounts of organics and is used in raised bed mixes

Three to four inches of bark mulch top dressing holds moisture in the soil and prevent weeds from germinating









Vegetable bed preparations

Traditional in ground bed - Strip off sod and turn (till) in 6+ inches of compost and 3 inches of expanded shale about 10-12 inches deep

Sheet mulch/Lasagna bed – Lay cardboard over existing sod and layer 6" of compost followed by 6" of mulch followed by 6" of a loamy topsoil and then topped with 6" of compost (24" total)

Raised bed – Framed or unframed bed using prepared raised bed mix and constructed to garden on top of the clay soil (no wider than 4 foot and at least 1 foot deep)

Container gardens - good potting mix and make sure pot is correct size for the plant and provide adequate water and fertilizer

Swale and Terrace – Mix 8+ inches of a finished compost and 3 inches of expanded shale about a foot deep into your stripped soil and row up the amended soil into uniform rows with deep trenches between rows (deep mulch your trenches)

Aqua/Hydroponics – Using water as the growing medium with specific focus on water chemistry







Traditional in ground vegetable bed



Sheet Mulching/Lasagna layering





Raised bed garden





Container Gardening









Swale and Terrace

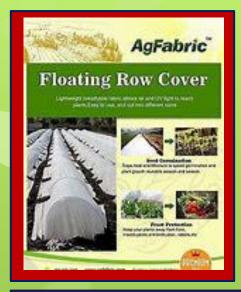


Hydroponics

Aquaponics



Row cover beds











Growing Tunnels









Irrigating the beds

Drip irrigation – battery operated (solar) or electric controlled delivers water to the root system where the water is needed and keep moisture off the leaves helping control diseases.

Using an emitter drip system pinpoints water delivery and keeps rows dry between the plants helping maintain weed control

Soaker hose – delivers water to the roots but may have a shorter hose life and waters the whole bed

Ollas and container watering – waters the root system but tends to run out of water in a few days and need to be continually filled















2 Short Growing Seasons in the Metroplex

Warm- plants that we consume the reproductive part (ovary)

Cool- plants that we consume the leaves, stems, roots and flowers (vegetative parts)

We can plant twice yearly to harvest by June and then again by November





Choosing your Plants

Determine if you should plant seeds directly in the ground or use transplants

Look for varieties that will thrive in our planting zone

Make sure you source from a reliable dealer or look for Master Gardener plant sales

Choose short stocky transplants that have a fresh green color and be sure to check the roots for rot

Use fresh seeds and make sure to plan your propagation so you have at least six weeks to grow and harden off your transplants







Transplant fruiting, some leafy and stem vegetables











Direct seed root, flowering, bean and some leafy vegetables















Vegetable Planting Guide

Vegetable Types	Planting depth in inches	Distance between rows	Average crop height ft	Spring planting dates* North Central Texas	Fall planting dates* North Central Texas	Days to crop maturity	Average (season) days
Asparagus	8-12	48-60	5	Feb. 1 - Mar. 1	Not Advised	700	60
Beans, snap bush	1-11/2	24-36	11/2	Mar. 18 -Apr.15	Aug. 1 - Sep. 15	45-60	15
Beans, snap pole	1-11/2	36-48	6-8	Mar. 18 -Apr.15	Jul. 30 -Aug. 10	60-70	30
Beans, Lima bush	1-11/2	30-36	11/2	Mar. 18 -Apr.15	Aug.15 - Sep.15	65-80	15
Beans, Lima pole	1-11/2	36-48	6 - 8	Mar. 18 -Apr.15	Jul. 25 -Aug. 15	75-85	40
Beets	1	12-24	11/2	Feb. 1 - Feb 15	Sep. 1 - Oct. 1	50-60	30
Broccoli	1/2	24-36	3	Feb. 1 - Feb 15	Aug.15- Sep.30	60-80	40
Brussels Sprouts	1/2	24-36	2	Feb. 1 - Feb 15	Aug.15- Sep.30	90-100	25
Cabbage	1/2	24-36	11/2	Feb. 1 - Feb 15	Aug.15- Sep.30	60-90	40
Cabbage, Chinese	1/2	18-30	11/2	Feb. 1 - Feb 15	Aug.10- Aug.30	65-70	25
Cantaloupe	1	48-96	1	Apr. 5 - May 1	Jul. 30 -Aug. 10	85-100	20
Carrot	1/2	12-24	2	Feb. 1 - Feb 15	Sep.1 - Sep.30	70-80	20
Cauliflower	1/2	24-36	3	Feb. 1 - Feb 15	Aug.15 -Sep.20	70-90	15
Chard, Swiss	1	18-30	2	Feb. 1 - Mar. 3	Aug.15 -Sep.15	45-55	40
Cilantro	1/2	12-24	2	Feb. 1 – Apr. 1	Sep. 1 - Sep. 30	40-60	30
Collard (Kale)	1/2	18-36	2	Feb. 1 - Mar. 3	Aug.25- Sep.20	50-80	60
Corn (sweet)	1/2	24-36	6 - 8	Mar. 18 -Apr. 30	Aug.10 -Aug.25	70-90	15
Cucumber	1/2	48-72	1	Mar. 18 -Apr. 30	Aug. 25-Sep. 10	50-70	30
Eggplant	1/2	24-36	3	Apr 1 Apr. 30	Jul. 30- Aug. 25	80-90	90
Garlic	1-2	10-18	1	Jan. 1 - Feb 15	Sept 15 - Oct 30	140-150	
Kohlrabi	1/2	12-18	11/2	Feb. 1 - Mar. 10	Aug.15 - Sep.20	55-75	15
Lettuce	1/2	12-24	1	Feb. 1 - Mar. 31	Sep. 1 - Sep. 30	40-80	25
Mustard	1/2	12-24	11/2	Mar.18 - Apr. 30	Aug.15 - Sep.30	30-40	30
Okra	1	24-36	5 - 7	Apr. 1 - Apr. 30	Jul. 1 - Aug. 25	55-65	90
Onion (plants)	1/2 - 1	12-18	11/2	Jan. 1 - Feb. 15	Aug.15 -Sep.15	80-120	40
Onion (seed)	1/2	12-18	11/2	Jan. 1 - Feb. 15	Sep. 1 - Sep. 20	90-120	40
Parsley	1/2	12-24	11/2	Feb. 1 - Mar. 15	Aug.15 -Oct. 10	70-90	90
Peas, English	2-3	18-36	2	Jan. 20 - Mar. 3	Sep. 15 - Nov. 1	55-90	10
Peas, black-eyed	2-3	24-36	21/2	Mar. 30- Apr. 30	Aug.15 - Sep. 1	60-70	30
Peppers	1/2	24-36	2-3	Mar. 30- May 30	Jul. 30 -Aug. 25	60-90	90
Potato, Irish	4	30-36	2	Feb. 1 - Feb 15	Jul. 30- Aug. 10	65-100	
Potato, Sweet	3 - 5	36-48	11/2	Apr.15 - Jun. 1	Not Advised	100-130	
Pumpkin	1-2	48-96	11/2	Mar. 25 -Apr. 25	Aug.10 -Aug. 25	75-100	-
Radish	1/2	12-18	1/2	Feb. 10 - Apr. 15	Sep.20 - Nov.15	25-40	15
Spinach	1/2	12-18	1	Jan. 20 - Mar. 10	Sep.15 - Nov. 1	40-60	40

Squash, Summer	1 - 2	24-60	2	Mar. 25 - Apr.15	Aug. 1 - Aug.30	50-60	40
Squash, Winter	1-2	48-78	1	Mar. 25 - Apr.15	Aug.10- Aug.30	85-100	
Tomato (transplant)	4-6	24-48	3-6	Mar. 1 - Apr. 30	June 20 - Jul. 15	55-90	40
Tomatio (transplant)	4-6	24-48	3 - 4	Mar. 1 - Apr. 30	June 20 - Jul. 15	60-90	40
Turnip, Greens	1/2	12-24	11/2	Feb. 1 - Mar. 10	Aug. 25 - Nov.1	30	40
Turnip, Roots	1/2	12-24	11/2	Feb. 1 - Mar. 10	Aug. 25 - Nov.1	30-60	30
Watermelon	1 - 2	60-96	1	Mar 30 - Apr. 30	Jul. 20- Aug. 10	80-100	30

^{*} Last avg. frost date March 18 - First avg. frost date Nov. 17

Spring Planting Times for North Central Texas

The numbers in parenthesis indicate minimum soil temperatures at which each vegetable should be planted in order to obtain optimum germination of seed and growth of transplants. Planting in soil that is too cool can lead to poor germination, seed rot, diseases and slow root and top growth of plants. For best results, plant during recommended dates, but only when soil temperatures reached the point designated.

The required temperature should be obtained on three consecutive mornings before the sun warms the soil. Proper temperature should be maintained to a depth of 6 to 8 inches. A kitchen thermometer (probe type - temperature range is 0° to 220°) is the easiest, most available and least expensive product to use for this purpose.

For more vegetable information see:

http://aggie-horticulture.tamu.edu/publications/guides/E-502_home_vegetable_guide.pdf

Dates	Vegetables from Seed (Soil Temperature)					
2/01 - 2/25	Cabbage (55) Carrots (50) Onions (50) Potatoes (50) Beets (55)					
2/10 - 3/01	Leeks (50) Peas (50) Chinese Cabbage (55)					
2/10 - 3/10	Spinach (50) Swiss Chard (55) Collards (55) Turnips (60)					
2/10 - 3/15	Lettuce (50) Parsley (55)					
2/10 - 4/15	Radish (50)					
3/18 - 4/15	Lima Beans (70)					
3/18 - 4/20	Snap Beans (60) Cucumbers (60)					
3/20 - 5/01	Sweet Corn (65) Mustard (65)					
3/25 - 4/15	Squash (70)					
3/25 - 5/01	Watermelon (70)					
4/01 - 5/20	Black-eyed Peas (65) Cantaloupe (75)					
4/05 - 5/01	Okra (75)					
4/15 - 6/01	Sweet Potatoes (75)					

Dates	Vegetables from Transplant (Soil Temperature)			
1/10 - 2/25	Onions (45)			
2/10 - 3/01	Broccoli (50) Kohlrabi (50) Cabbage (55) Chinese Cabbage (55)			
3/01 - 4/30	Tomatoes (60)			
3/21 - 5/01	Peppers (70) Eggplant (75)			





Vegetable Varieties for North Central Texas

ASPARAGUS Jersey Giant, UC 157

BASIL Sweet, Spicy Globe

BEANS, SNAP BUSH: Blue Lake 274, Top Crop, Tendercrop, Contender, Tendergreen, Derby

BEANS, YELLOW BUSH: Goldcrop, Improved Golden Wax

BEANS, PINTO Improved Pinto

BEANS, SNAP POLE Blue Lake, Kentucky Wonder

BEANS, LIMA BUSH Henderson Baby Bush, Jackson Wonder

BEANS, LIMA POLE Florida Speckled, King of the Garden

BEETS Pacemaker III

BROCCOLI <u>Spring only:</u> Premium Crop, Emperor <u>Spring or fall</u>: Green Comet, Galaxy, Packman

BRUSSELS SPROUTS Prince Marvel, Royal Marvel

CABBAGE Early Jersey Wakefield Ace (wrinkled leaves) CABBAGE, CHINESE

Jade Pagoda, Michihli, China Pride, China Flash (Napa type)

CANTALOUPE - <u>Hybrids</u>: Magnum 45, Ambrosia, Mission, Explorer, Caravelle, Non-Hybrids: Uvalde, Perlita

CARROT Royal Chantenay, Burpee's Toudo, Park's Nandor, Danver's126, Red Cored Chantenay

CAULIFLOWER Snow Crown

CHARD, SWISS Rhubarb (red color), Lucullus, Fordhook

COLLARDS Blue Max, Georgia

CORN, SWEET Yellow: Golden Queen, Guadalupe Gold Bicolor: Sweet G-90, Frontier, Honey & Pearls White: Silver Queen

CUCUMBER, PICKLING Carolina, Liberty, Saladin, County Fair 87

CUCUMBER, SLICING Sweet Slice, Burpless, Dasher II, Slicemaster, County Fair 87

EGGPLANT Florida Market

GARLIC Texas White, Ajo Rojo, Burgundy, Creole Red, Metechi

KALE Dwarf Blue Curled, Blue Knight

KOHLRABI Grand Duke

LEEKS American Flag

LETTUCE, BUTTERHEAD Buttercrunch

LETTUCE, LEAF Salad Bowl, Black Seeded Simpson, Red Sails (red color)

LETTUCE, COS or ROMAINE Romaine

MUSTARD Florida Broadleaf, Southern Giant Curled, Tendergreen

OKRA Lee, Emerald, Clemson Spineless

ONION BULBING Yellow: Texas Supersweet (Grano 1015Y), Yellow Granex

ONION BULBING Red: Red Granex, Burgundy
ONION BULBING White: Crystal Wax, White Granex
ONION, BUNCHING (SCALLIONS) Beltsville Bunching

PARSLEY Moss Curled, Plain (Italian)

PEAS, ENGLISH Little Marvel, Wando

PEAS, EDIBLE-PODDED Spring only: Sugar Snap (bush)

Spring or fall: Sugar Ann (bush), Sugar Pop (bush), Super SugarMel (vine)

PEAS, SOUTHERN Blackeye #5, Mississippi Silver, Purple Hull, Zipper Cream Crowder, Colossus Crowder

PEPPER, HOT Hungarian Yellow Wax, Long Red or Slim Cayenne, Jalapeno.

TAM Mild Jalapeno

PEPPER, SWEET BELL Green: Big Bertha, Jupiter (mature color: red),

SummerSweet 860 (mature color: yellow)

PEPPER, SWEET SALAD Gypsy, Sweet Pickle, Cubanelle POTATO, IRISH

Red: Norland (early season), Red LaSoda (midseason)

White: Kennebec (late season)

POTATO, SWEET Jewell, Centennial, Vardaman

PUMPKIN Connecticut Field, Spirit, Small Sugar, Autumn Gold, Jack Be Little (ornamental)

RADISH Red: Inca, Champion, Cherry Belle White: White Icicle, Snow Belle

RUTABAGA American Purple Top

SPINACH Melody, Coho, Fall Green

SQUASH, SUMMER Multipik, Dixie, Sun Drops, Burpee's Butterstick

SQUASH, SUMMER PAN-TYPE Yellow: Sunburst, Green: Peter Pan

SQUASH, WINTER Early Butternut, Sweet Mama, Table Ace, Table King Bush Acorn, Cream of the Crop

SQUASH, ZUCCHINI Green: Senator, President, Yellow: Goldrush

Note Regarding Tomatoes: Cultivars listed as determinate are the bush type whereas those listed as indeterminate are the vine type. "A" indicates genetic resistance to Alternaria, "F1" to Fusarium wilt race 1, "F2" to Fusarium wilt race 2, "N" to root knot nematodes, "S" to Stemphylium (gray leaf spot), "T" to tobacco mosaic virus, "V" to Verticillium wilt.

TOMATOES, LARGE-FRUITED

<u>Spring: Determinate:</u> Celebrity VFNT, Carnival VFNT, Surefire VF1, President VFNT, Merced VF1F2ST. Heatwaye VF1F2SA

<u>Spring: Indeterminate:</u> Champion VFNT, Quick Pick VFNT, Early Girl VFF, First Lady VFNT, Superfantastic VFN, Park's Whopper Improved VFFNT

TOMATOES, PASTE

Fall: Indeterminate: Roma VF, San Marzano

TOMATOES, SMALL-FRUITED

Indeterminate: Porter, Cherry Grande, Sweet 100

Fall: Determinate: Surefire VF1, Heatwave VF1F2SA

TURNIP <u>Spring or fall:</u> Tokyo Cross, Royal Globe II, White Lady, <u>Fall only:</u> Just Right **WATERMELON**

Regular. Crimson Sweet, Sugar Baby, Royal Sweet, Orange Golden, Star Brite Triploid or seedless (transplants only): Jack of Hearts, Supersweet 5032, Tiffany

For more vegetable information see:

http://aggie-horticulture.tamu.edu/publications/guides/E-502_home_vegetable_guide.pdf

This list was developed to inform the gardener of some of the better varieties of vegetables in this area. These varieties Texas Extension in Tarrant County were selected for their productivity, their resistance to common diseases and for their adaptability to Tarrant County. Using recommended varieties will not necessarily produce the desired results. Proper vatiening, fertilization, weed control, etc., are also important aspects of successful gardening. Varieties are listed at random and not in order of preference.

PEEL BACK FLAPS MORE INFO INSIDE £ " 47408"01538" 7

MUSTARD Mizuna

We are dedicated to inspiring & educating the gardener in you. That's why we've put even more helpful information inside.

Brassica rapa nipposinica

Days to Emerge: 5 - 10 Days Seed Depth: 1/4" - 1/2"

Seed Spacing: A group of 4 seeds every 10"

Row Spacing: 18" (10" as bedding plant)

Thinning: When 1" tall, thin to 1 every 10"

Illustrated by Priscilla Baldwin Commonly used both as a graceful plant in flower beds and as a tender, mildly spicy mustard green that is ready to harvest in as little as 3 weeks. Withstands heat longer than lettuce without bolting. Beautiful, graceful, prolific branching plant will also germinate under cold and wet spring conditions. Use fresh in salads, steam or stir-fry. Does not have the pungency of common or Chinese mustards. This packet plants three 10 foot rows.

When to sow outside: RECOMMENDED. 4 to 6 weeks before average last frost or as soon as soil can be worked. After initial sowing, sow every 3 weeks until early fall for continuous harvest. *Mild winter climates:* Can be sown in late fall through winter for winter, early spring harvest. When to start inside: Not recommended.

* ALL OUR SEEDS ARE UNTREATED





100% Certified Organic by the Colorado Dept. of Agriculture

© Botanical Interests, Inc. 660 Compton Street Broomfield, Colorado 80020 www.botanicalinterests.com

> Lot #26 Packed for 2015 Sell By 12/31/2015



Tomato Disease Resistance Codes

- V Verticillium Wilt
- F Fusarium Wilt (FF Races 1 & 2; FFF Races 1, 2, & 3)
- N Nematodes
- T Tobacco Mosaic Virus
- A Alternaria Stem Canker
- St Stemphylium Gray Leaf Spot
- TSWV Tomato Spotted Wilt Virus



sheknows

Fertilizing your crops

For fruit crops apply 2 applications of vegetative blend and 4 applications of fruiting blend at 3- week intervals (18-week plan)

For leaf and stem crops apply 6 applications of vegetative blend at 3 weeks intervals (18-week plan)

For root and shoot crops apply a balanced mix at 3-week intervals up until 2 weeks of harvest

Apply applications around dripline of plants then scratch in and water

Use a complete fertilizer with micronutrients either synthetic or organic

Organic Fruit blend

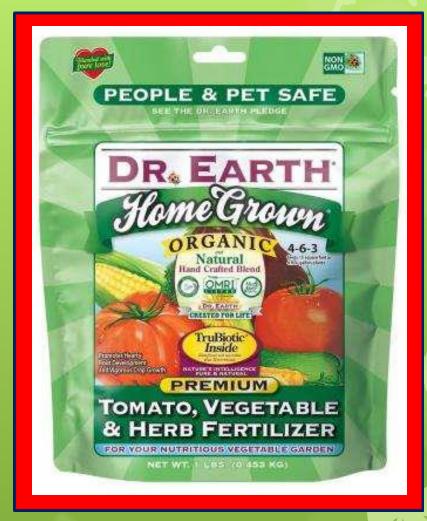




1/2

Organic Vegetative blend

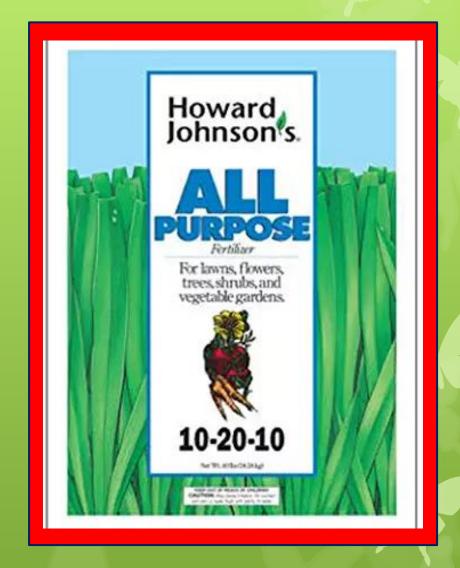




1/2

Synthetic Fertilizer blends





Vegetative/Green growth

Fruiting/Flowering

Balanced Blend (Synthetic and Organic)





Tomato, Pepper, Eggplant

Plant after last frost date (March 1 to April 30 spring - June 20 to July 15 fall)

Tomatoes are either determinate (bush) or non determinate (vine)

Keep soil moist (not soggy) and do not let the plant wilt. Water slowly and deeply to stimulate deep root growth (mulch beds)

2 vegetative and 4 fruiting fertilizer applications (3-week intervals)

Prune up (arborize) and head off (top cut in summer after fruit set) indeterminate tomatoes to increase fruit yield, fruit size and quality

Remove suckers from determinate tomatoes varieties until fruit set

Select quick fruiting medium sized varieties 54 to 75-day spring and fall

Peak harvest equates to fruit color (you may pick half colored if pest pressure is present on tomatoes and peppers)

Store at room temperature until full color and placed spaced out so fruit does not touch (NEVER REFRIGERATE) USE AS SOON AS FRUIT RIPENS





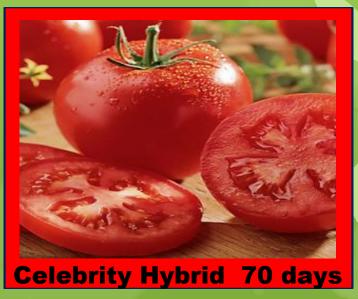


Varieties for North Texas

















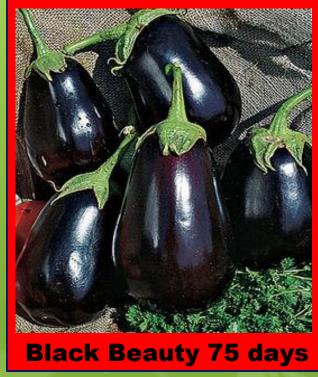












Japanese Hybrid 60 days

Cucumbers, Squash, Zucchini, Melons

Plant well after last frost 9 April 1 to May 1 for spring and June 30 to August 10 for fall)

3 vegetative and 3 fruiting fertilizer applications (3-week intervals)

Keep soil moist but not soggy and water slowly and deeply (mulch beds)

Thinning fruit will increase fruit size

Select medium sized fruiting varieties to accommodate our growing seasons

Harvest equates to fruit color, the fruit vine connection

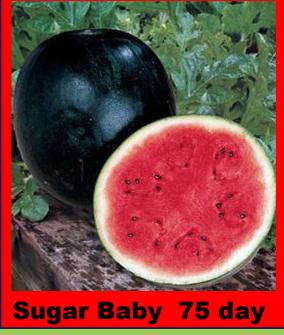
Store in fridge for about a week



















Beans, Peas and the Legumes

Plant seeds after last frost date for beans (March 20th to April 15th spring and July 30th to August 15th for fall) and for Peas (Jan 20th to March 3rd for spring and September 15th to November 1st for fall planting)

2 vegetative and 4 fruiting fertilizer applications (3-week intervals)

Beans are warm season and peas are cool season

Water slowly and deeply and keep soil moist through flowering and bean production (mulch beds after plants are 3 inches tall)

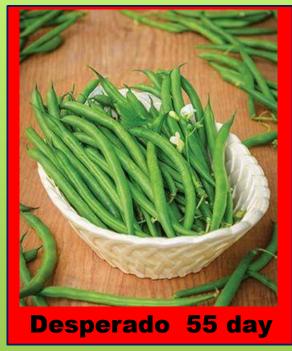
Harvest beans and peas according to length, girth and pod swell

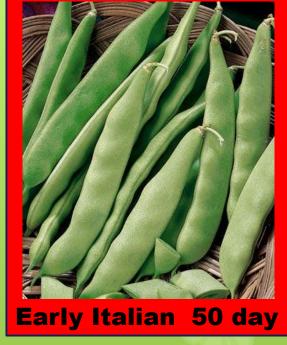
Store peas in a plastic bag in fridge for up to two weeks and beans the same for about 1 week

















Broccoli, Cauliflower, Cabbage, and Brussel Sprouts

Plant late winter (February 1st to February 15th for spring and August 15th to September 20th for fall) to assure crops between summer heat and winter freeze

2 vegetative and 4 fruiting fertilizer applications (3-week intervals)

Prune off first broccoli head to stimulate multiple branch flowering and strip lower Brussel sprout leaves to increase head size

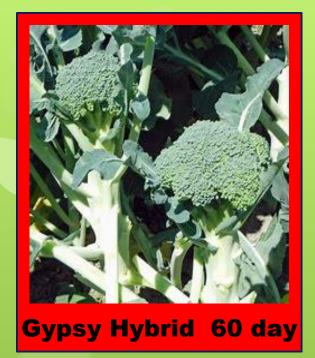
Harvest flowers and leafy heads before they open or flower

Pick cabbage when ready to eat and store broccoli, Brussel sprouts and cauliflower in fridge crisper for a few days



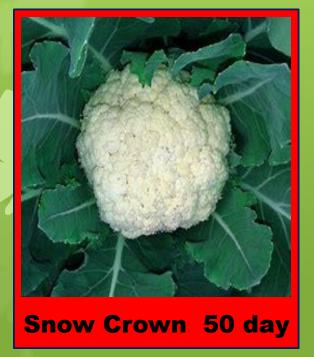
















Spinach, Lettuce, Kale, Collards and Swiss Chard

Plant early spring and mid fall to assure crops between summer heat and winter freeze (January 20th to March 31st for spring and September 1st to November 1st for fall)

6 vegetative fertilizer applications at 3 week intervals

Water deeply and slowly to encourage deep root growth and do not let plants wilt (mulch beds)

Harvest heads as needed until summer or before the head opens

Pick lower leaves when ready to eat and you could store leaves in fridge crisper in a plastic bag for a few days if needed











Buttercrunch 55 day

Lacinato / grazing 20 day







Curley Kale / grazing 20 day

Brite Lights / grazing 25 days

Blue Max 55 day

Carrots, Radishes, Turnips and Beets

Plant seeds late winter for spring from February 1st to February 15th and then September 1st to Sept 30th for spring harvest

6 balanced (13-13-13) fertilizer applications at 3-week intervals

When plants are 4 inches high thin plants to give each plant about 4 inches of growing space

Water deeply and slowly for larger root and mulch after seeds are 3 inches tall

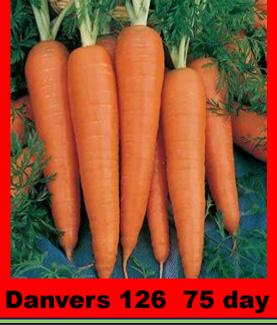
Harvest before summer heat or hard winter freeze (larger roots can turn woody) and before bolting

Remove all greens stems and store unwashed in refrigerate for up three months





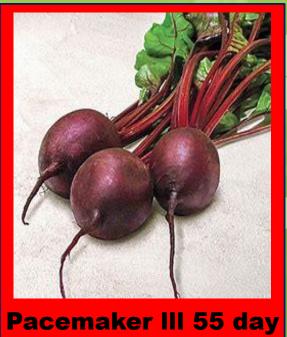












Irish Potato and Sweet Potato

Plant seed Irish potatoes February 1st to February 15th for spring and July 10th to August 30th for fall

Plant sweet potato slips April 15th to June 1st for fall harvest

6 balanced (13-13-13) fertilizer applications at 3-week intervals

Keep moisture consistent and make sure the beds drain well

Harvest Irish potatoes when top growth browns and Sweet when top growth turns yellow and cure the Sweet potatoes in open air about 2 weeks before storing

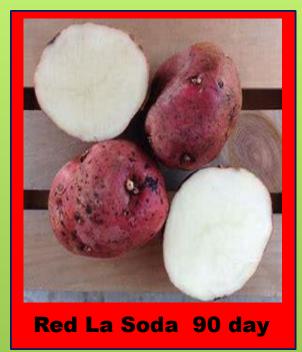
Store in cool dark place up to few months (until sprout or potato greening)





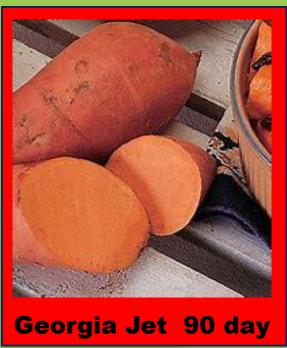














Insect issues (THE CHEWERS insects)



Flea Beetle



Colorado Potato Beetle





Bean Leaf Bug



Harlequin Bug



Leaf Miner



Cucumber Beetle

Damage is characterized by holes in the leaf usually contained in the center of leaf and the eggs can be detected in the underside of the leaf

Some are Vectors

Controls Chemical- Sevin Dust (Carbaryl) **Organic-Spinosad**, Neem oil **Mechanical- Pick em** off

hard water spray

Insect issues (THE SUCKERS insects)



Squash Bug



Spider Mite



Stink Bug



Leaf Hopper



Aphids



Damage is characterized by a discoloration of leaf or fruit

Some are Vectors

Controls
OrganicSpinosad
Neem oil
Chemical- Sevin
dust
MechanicalHard water
spray or pick em
off

Insect issues (The CHEWERS- Caterpillars)





Cutworm



Squash Vine Borer



Cabbage Lopper



Tomato Horn Worm

Damage is characterized by Holes in leaves (usually from the outside of the leaf inwards)

Control
Organic – Bacillus Thuringiensis (B.T.)
Dipel or Thuricide
Mechanical – Pick em off

Squash Vine Borer – Cut em out of stem or maybe Sevin dust (but with limited results)?



Disease issues

Damping off disease-Fungal pathogen in the soil that thrives in wet soil conditions Fungicide treated seeds are recommended



Wet warm spring fungus-Powdery Mildew, Anthracnose 0- Sulfurs labeled for leafy greens



Mosaic Virus – carried from plant to plant by a vector (aphids)
Pull and destroy all infected plants



Septoria leaf spot – fungal infection caused by humid conditions and irrigation spray on leaves

O- Copper spray or a bio fungicide such as Serenade C- Chlorothalonil such Fungonil or Daconil

Both can help control blights and other leaf spot diseases

Disease issues



Blossom end rot – caused by uneven watering leading to calcium deficiently

Can be prevented by best practice watering methods



Aggiehort Vegetable Gardening

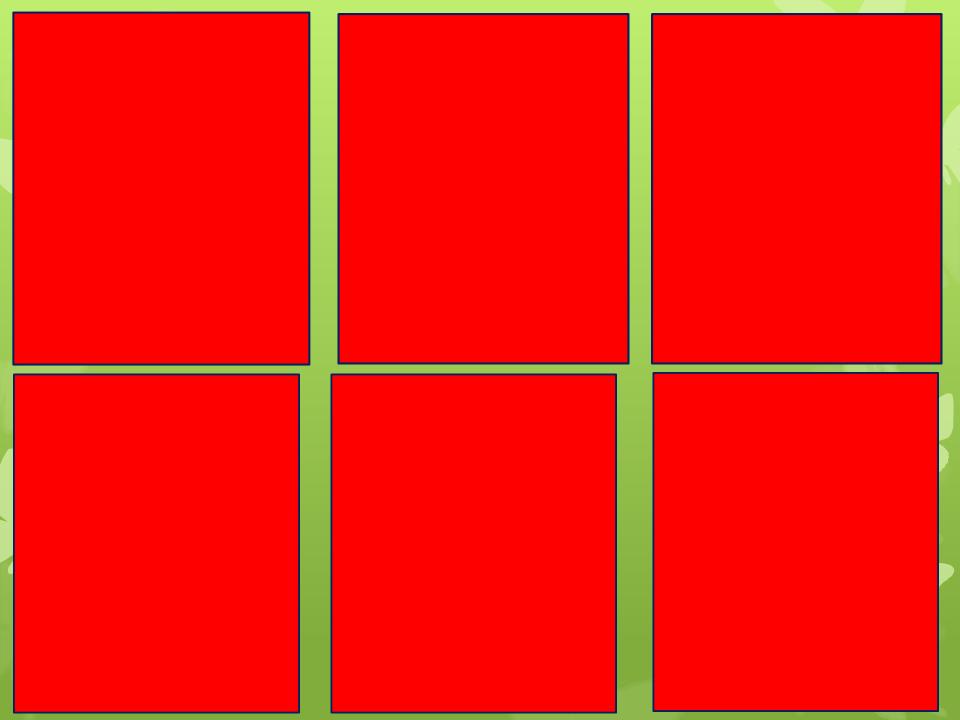
Dallas County Master Gardener



Shut up and Grow Veggies !!



Jeff Raska jwraska@ag.tamu.edu





Greens in our Gardens



The Groovy Greens

Jeff Raska

Dallas County Horticultural Program Assistant

Texas A&M AgriLife Extension

The Green Facts

Most all greens are cool season crops (60 to 80 degrees for most efficient growth))

Leafy greens need at least 6 hours of full sun while most vegetable crops need at least 8

The veggie garden needs to be close to a water source – vegetables require a consistent supply of water to produce

The garden needs to be placed in an area that drains well

Vegetables need WEED free beds to establish and grow well

Start small with just a couple of raised beds to see if it fits your family and place it close to your house if possible to be sure to notice any problems quickly

GROW WHAT YOU LIKE TO EAT AND BE AWARE OF YOU SPACE LIMITATIONS

Prepare the soil correctly to get your garden started on a stable foundation





8 foot long x 4 foot wide x 1 foot deep wooden raised bed





3 - 2' x 8 ' x 12" ground contact boards @ 12.50 each	47.50
1 – 4" x 4" x 10' post cut to 6 equal pieces @ 9.95	9.95
1 - small box of deck screws @ 9.75	9.75
8 - 2 cubic foot bags of compost @ 3.25 each	26.00
10 - 40 lbs. bags of top soil @ 1.97 each	19.70
2 – 3 cubic foot bags of bark mulch @ 3.95 each	7.90
TOTAL PER BED CONSTRUCTION	\$ 123.80

TOTAL FOR DRIP GRID SYSTEM PER BED IS 50 TO 75 DOLLARS EACH

Start with the soil

Soil preparation is one of the most important factors in vegetable gardening

Vegetables are heavy feeders and need lots of organic matter in the soil to produce abundantly

Best production comes from sandy loam well drained soils with a PH of 6.2 to 6.8

Since we live in a Black land Prairie region most of us have clay soils with PH values at 7 or above

Clay soil is clumpy and gluey when wet and hard and develops large cracks when dry

Clay soil drains poorly and binds most of it's available nutrients





Growing Veggies

Most vegetables need at least 8 hours of direct sun

All vegetables need consistent watering along with good drainage

All vegetables require multiple fertilizations throughout their growing season

All vegetable gardens need to be weed free

All veggies are vulnerable to insects and diseases

If starting with transplants start seeds inside 6 to 8 weeks before planting



Raised beds







1/2

1/2

Vegetable bed preparations

Traditional in ground bed - Strip off all sod and turn (till) in 6 inches of compost and 3 inches of expanded shale about 8-10 inches deep

Sheet mulch/Lasagna bed – Lay cardboard on existing sod and layer 6" of compost followed by 6" of mulch followed by 6" of a loamy top soil and then topped with 6" of compost (24" total)

Raised bed – Framed or unframed bed using prepared raised bed mix and constructed to garden on top of the clay soil (framed no wider than 4 foot and at least 1 foot deep)

Container gardens - good potting mix and make sure pot is correct size for the plant and provide enough water

Hydro/Aquaponics – Using water as the growth medium utilizing nutrient chemistry in a liquid environment







Raised bed garden



Traditional in ground vegetable bed

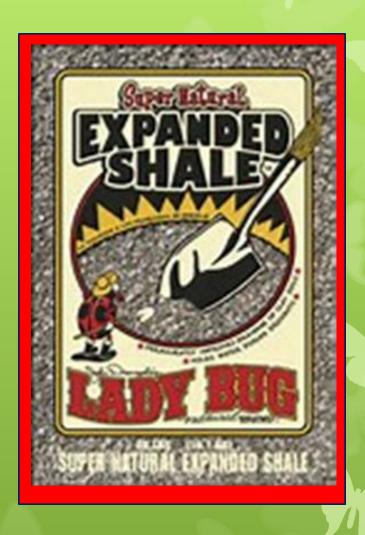
Raised beds



In ground beds (clay)







6 inches

3 inches

Containers



Containers



Irrigating the beds

Drip irrigation – battery operated or electric controlled delivers water to the root system where the water is needed and keep moisture off the leaves helping control diseases.

Using a emitter drip system pin points water delivery and keeps rows dry between the plants helping maintain weed control

Soaker hose – delivers water to the roots but may have a shorter hose life and waters the whole bed

Ollas and container watering – waters the root system but tends to run out of water in a few days and need to be continually filled







Broccoli, Cauliflower, Cabbage, and Brussel Sprouts

Plant late winter (February 1st to February 15th for spring and August 15th to September 20th for fall) to assure crops between summer heat and winter freeze

Use a high nitrogen (VEGETATIVE) complete fertilizer at planting and at three week intervals for two more applications and then use a high phosphorus (FLOWERING) blend every 3 weeks until harvest

Prune off first broccoli head to stimulate multiple branch flowering and strip lower Brussel sprout leaves to increase head size

Water deeply and slowly to assure deep rooting of plant and do not let plant wilt (mulch bed)

Harvest flowers and leafy heads before they open or color out

Pick cabbage when ready to eat and store broccoli, Brussel sprouts and cauliflower in fridge crisper for a few days







Carrots, Radishes, Turnips and Beets

Plant seeds late winter for spring from February 1st to February 15th and then September 1st to Sept 30th for spring harvest

Prepare deep composted beds for larger root crop and fertilize with a complete balanced blend (example13-13-13) two weeks before sowing seeds and then fertilize every three weeks after planting until harvest

When plants are 4 inches high thin plants to give each plant about 4 inches of growing space

Water deeply and slowly for larger root and mulch after seeds are 3 inches tall

Harvest before summer heat or hard winter freeze (larger roots can turn woody) and before bolting

Remove all greens stems and store unwashed in refrigerate for up three months





Insect issues (THE CHEWERS insects)



Flea Beetle



Harlequin Bug



Leaf Miner



Colorado Potato Beetle



Bean Leaf Bug



Cucumber Beetle

Damage is characterized by holes in the leaf usually contained in the center of leaf and the eggs can be detected in the underside of the leaf

Some are Vectors

Controls Chemical- Sevin Dust (Carbaryl) **Organic-Spinosad, Neem oil** Mechanical-Pick em off hard water spray

Insect issues (The CHEWERS- Caterpillars)







Squash Vine Borer

Cutworm



Cabbage Looper



Tomato Horn Worm

Damage is characterized by Holes in leaves (usually from the outside of the leaf inwards)

Control
Row cover
Organic – Bacillus Thuringiensis (B.T.)
Dipel or Thuricide
Mechanical – Pick em off

Squash Vine Borer – Cut em out of stem or maybe Sevin dust (but with limited results ?)

Insect issues (THE SUCKERS insects)



Squash Bug





Stink Bug





Aphids



Damage is characterized by a discoloration of leaf or fruit

Some are Vectors

Controls Organic-Spinosad Neem oil Chemical- Sevin dust Mechanical- Hard water spray or pick em off



Disease issues

Damping off disease-Fungal pathogen in the soil that thrives in wet soil conditions Fungicide treated seeds are recommended



Wet warm spring fungus-Powdery Mildew, Anthracnose 0- Sulfurs labeled for leafy greens



Mosaic Virus-Carried by aphids form plant to plant Pull and destroy infected plants



Septoria leaf spot – fungal infection caused by humid conditions and irrigation spray on leaves

O- Copper spray or a bio fungicide such as Serenade C- Chlorothalonil such Fungonil or Daconil

Both can help control blights and other leaf spot diseases

Disease issues



Downey Mildew (Fungus)-Can infect in cold wet weather

Pull infected plants and remove from property





Vegetable Planting Guide

Vegetable Types	Planting depth in inches	Distance between rows	Average crop height ft	Spring planting dates* North Central Texas	Fall planting dates* North Central Texas	Days to crop maturity	Average (season) days
Asparagus	8-12	48-60	5	Feb. 1 - Mar. 1	Not Advised	700	60
Beans, snap bush	1-11/2	24-36	11/2	Mar. 18 -Apr.15	Aug. 1 - Sep. 15	45-60	15
Beans, snap pole	1-11/2	36-48	6-8	Mar. 18 -Apr.15	Jul. 30 -Aug. 10	60-70	30
Beans, Lima bush	1-11/2	30-36	11/2	Mar. 18 -Apr.15	Aug.15 - Sep.15	65-80	15
Beans, Lima pole	1-11/2	36-48	6 - 8	Mar. 18 -Apr.15	Jul. 25 -Aug. 15	75-85	40
Beets	1	12-24	11/2	Feb. 1 - Feb 15	Sep. 1 - Oct. 1	50-60	30
Broccoli	1/2	24-36	3	Feb. 1 - Feb 15	Aug.15- Sep.30	60-80	40
Brussels Sprouts	1/2	24-36	2	Feb. 1 - Feb 15	Aug.15- Sep.30	90-100	25
Cabbage	1/2	24-36	11/2	Feb. 1 - Feb 15	Aug.15- Sep.30	60-90	40
Cabbage, Chinese	1/2	18-30	11/2	Feb. 1 - Feb 15	Aug.10- Aug.30	65-70	25
Cantaloupe	1	48-96	1	Apr. 5 - May 1	Jul. 30 -Aug. 10	85-100	20
Carrot	1/2	12-24	2	Feb. 1 - Feb 15	Sep.1 - Sep.30	70-80	20
Cauliflower	1/2	24-36	3	Feb. 1 - Feb 15	Aug.15 -Sep.20	70-90	15
Chard, Swiss	1	18-30	2	Feb. 1 - Mar. 3	Aug.15 -Sep.15	45-55	40
Cilantro	1/2	12-24	2	Feb. 1 – Apr. 1	Sep. 1 - Sep. 30	40-60	30
Collard (Kale)	1/2	18-36	2	Feb. 1 - Mar. 3	Aug.25- Sep.20	50-80	60
Corn (sweet)	1/2	24-36	6 - 8	Mar. 18 -Apr. 30	Aug.10 -Aug.25	70-90	15
Cucumber	1/2	48-72	1	Mar. 18 -Apr. 30	Aug. 25-Sep. 10	50-70	30
Eggplant	1/2	24-36	3	Apr 1 Apr. 30	Jul. 30- Aug. 25	80-90	90
Garlic	1-2	10-18	1	Jan. 1 - Feb 15	Sept 15 - Oct 30	140-150	
Kohlrabi	1/2	12-18	11/2	Feb. 1 - Mar. 10	Aug.15 - Sep.20	55-75	15
Lettuce	1/2	12-24	1	Feb. 1 - Mar. 31	Sep. 1 - Sep. 30	40-80	25
Mustard	1/2	12-24	11/2	Mar.18 - Apr. 30	Aug.15 - Sep.30	30-40	30
Okra	1	24-36	5 - 7	Apr. 1 - Apr. 30	Jul. 1 - Aug. 25	55-65	90
Onion (plants)	1/2 - 1	12-18	11/2	Jan. 1 - Feb. 15	Aug.15 -Sep.15	80-120	40
Onion (seed)	1/2	12-18	11/2	Jan. 1 - Feb. 15	Sep. 1 - Sep. 20	90-120	40
Parsley	1/2	12-24	11/2	Feb. 1 - Mar. 15	Aug.15 -Oct. 10	70-90	90
Peas, English	2-3	18-36	2	Jan. 20 - Mar. 3	Sep. 15 - Nov. 1	55-90	10
Peas, black-eyed	2-3	24-36	21/2	Mar. 30- Apr. 30	Aug.15 - Sep. 1	60-70	30
Peppers	1/2	24-36	2-3	Mar. 30- May 30	Jul. 30 -Aug. 25	60-90	90
Potato, Irish	4	30-36	2	Feb. 1 - Feb 15	Jul. 30- Aug. 10	65-100	
Potato, Sweet	3 - 5	36-48	11/2	Apr.15 - Jun. 1	Not Advised	100-130	
Pumpkin	1-2	48-96	11/2	Mar. 25 -Apr. 25	Aug.10 -Aug. 25	75-100	-
Radish	1/2	12-18	1/2	Feb. 10 - Apr. 15	Sep.20 - Nov.15	25-40	15
Spinach	1/2	12-18	1	Jan. 20 - Mar. 10	Sep.15 - Nov. 1	40-60	40

Squash, Summer	1 - 2	24-60	2	Mar. 25 - Apr.15	Aug. 1 - Aug.30	50-60	40
Squash, Winter	1-2	48-78	1	Mar. 25 - Apr.15	Aug.10- Aug.30	85-100	
Tomato (transplant)	4-6	24-48	3-6	Mar. 1 - Apr. 30	June 20 - Jul. 15	55-90	40
Tomatio (transplant)	4-6	24-48	3 - 4	Mar. 1 - Apr. 30	June 20 - Jul. 15	60-90	40
Turnip, Greens	1/2	12-24	11/2	Feb. 1 - Mar. 10	Aug. 25 - Nov.1	30	40
Turnip, Roots	1/2	12-24	11/2	Feb. 1 - Mar. 10	Aug. 25 - Nov.1	30-60	30
Watermelon	1 - 2	60-96	1	Mar 30 - Apr. 30	Jul. 20- Aug. 10	80-100	30

^{*} Last avg. frost date March 18 - First avg. frost date Nov. 17

Spring Planting Times for North Central Texas

The numbers in parenthesis indicate minimum soil temperatures at which each vegetable should be planted in order to obtain optimum germination of seed and growth of transplants. Planting in soil that is too cool can lead to poor germination, seed rot, diseases and slow root and top growth of plants. For best results, plant during recommended dates, but only when soil temperatures reached the point designated.

The required temperature should be obtained on three consecutive mornings before the sun warms the soil. Proper temperature should be maintained to a depth of 6 to 8 inches. A kitchen thermometer (probe type - temperature range is 0° to 220°) is the easiest, most available and least expensive product to use for this purpose.

For more vegetable information see:

http://aggie-horticulture.tamu.edu/publications/guides/E-502_home_vegetable_guide.pdf

Vegetables from Seed (Soil Temperature)					
Cabbage (55) Carrots (50) Onions (50) Potatoes (50) Beets (55)					
Leeks (50) Peas (50) Chinese Cabbage (55)					
Spinach (50) Swiss Chard (55) Collards (55) Turnips (60)					
Lettuce (50) Parsley (55)					
Radish (50)					
Lima Beans (70)					
Snap Beans (60) Cucumbers (60)					
Sweet Corn (65) Mustard (65)					
Squash (70)					
Watermelon (70)					
Black-eyed Peas (65) Cantaloupe (75)					
Okra (75)					
Sweet Potatoes (75)					

vegetables from Transplant (Soil Temperature)
Onions (45)
Broccoli (50) Kohlrabi (50) Cabbage (55) Chinese Cabbage (55)
Tomatoes (60)
Peppers (70) Eggplant (75)

Vogetables from Tuescalent (C. 1) T





Vegetable Varieties for North Central Texas

ASPARAGUS Jersey Giant, UC 157

BASIL Sweet, Spicy Globe

BEANS, SNAP BUSH: Blue Lake 274, Top Crop, Tendercrop, Contender, Tendergreen, Derby

BEANS, YELLOW BUSH: Goldcrop, Improved Golden Wax

BEANS, PINTO Improved Pinto

BEANS, SNAP POLE Blue Lake, Kentucky Wonder

BEANS, LIMA BUSH Henderson Baby Bush, Jackson Wonder

BEANS, LIMA POLE Florida Speckled, King of the Garden

BEETS Pacemaker III

BROCCOLI <u>Spring only:</u> Premium Crop, Emperor <u>Spring or fall</u>: Green Comet, Galaxy, Packman

BRUSSELS SPROUTS Prince Marvel, Royal Marvel

CABBAGE Early Jersey Wakefield Ace (wrinkled leaves) CABBAGE, CHINESE

Jade Pagoda, Michihli, China Pride, China Flash (Napa type)

CANTALOUPE - <u>Hybrids</u>: Magnum 45, Ambrosia, Mission, Explorer, Caravelle, Non-Hybrids: Uvalde, Perlita

CARROT Royal Chantenay, Burpee's Toudo, Park's Nandor, Danver's126, Red Cored Chantenay

CAULIFLOWER Snow Crown

CHARD, SWISS Rhubarb (red color), Lucullus, Fordhook

COLLARDS Blue Max, Georgia

CORN, SWEET Yellow: Golden Queen, Guadalupe Gold Bicolor: Sweet G-90, Frontier, Honey & Pearls White: Silver Queen

CUCUMBER, PICKLING Carolina, Liberty, Saladin, County Fair 87

CUCUMBER, SLICING Sweet Slice, Burpless, Dasher II, Slicemaster, County Fair 87

EGGPLANT Florida Market

GARLIC Texas White, Ajo Rojo, Burgundy, Creole Red, Metechi

KALE Dwarf Blue Curled, Blue Knight

KOHLRABI Grand Duke

LEEKS American Flag

LETTUCE, BUTTERHEAD Buttercrunch

LETTUCE, LEAF Salad Bowl, Black Seeded Simpson, Red Sails (red color)

LETTUCE, COS or ROMAINE Romaine

MUSTARD Florida Broadleaf, Southern Giant Curled, Tendergreen

OKRA Lee, Emerald, Clemson Spineless

ONION BULBING Yellow: Texas Supersweet (Grano 1015Y), Yellow Granex

ONION BULBING Red: Red Granex, Burgundy
ONION BULBING White: Crystal Wax, White Granex
ONION, BUNCHING (SCALLIONS) Beltsville Bunching

PARSLEY Moss Curled, Plain (Italian)

PEAS, ENGLISH Little Marvel, Wando

PEAS, EDIBLE-PODDED Spring only: Sugar Snap (bush)

Spring or fall: Sugar Ann (bush), Sugar Pop (bush), Super SugarMel (vine)

PEAS, SOUTHERN Blackeye #5, Mississippi Silver, Purple Hull, Zipper Cream Crowder, Colossus Crowder

PEPPER, HOT Hungarian Yellow Wax, Long Red or Slim Cayenne, Jalapeno.

TAM Mild Jalapeno

PEPPER, SWEET BELL Green: Big Bertha, Jupiter (mature color: red),

SummerSweet 860 (mature color: yellow)

PEPPER, SWEET SALAD Gypsy, Sweet Pickle, Cubanelle

POTATO, IRISH

Red: Norland (early season), Red LaSoda (midseason)

White: Kennebec (late season)

POTATO, SWEET Jewell, Centennial, Vardaman

PUMPKIN Connecticut Field, Spirit, Small Sugar, Autumn Gold, Jack Be Little (ornamental)

RADISH Red: Inca, Champion, Cherry Belle White: White Icicle, Snow Belle

RUTABAGA American Purple Top

SPINACH Melody, Coho, Fall Green

SQUASH, SUMMER Multipik, Dixie, Sun Drops, Burpee's Butterstick

SQUASH, SUMMER PAN-TYPE Yellow: Sunburst, Green: Peter Pan

SQUASH, WINTER Early Butternut, Sweet Mama, Table Ace, Table King Bush Acorn, Cream of the Crop

SQUASH, ZUCCHINI Green: Senator, President, Yellow: Goldrush

Note Regarding Tomatoes: Cultivars listed as determinate are the bush type whereas those listed as indeterminate are the vine type. "A" indicates genetic resistance to Alternaria, "F1" to Fusarium wilt race 1, "F2" to Fusarium wilt race 2, "N" to root knot nematodes, "S" to Stemphylium (gray leaf spot), "T" to tobacco mosaic virus, "V" to Verticillium wilt.

TOMATOES, LARGE-FRUITED

Spring: Determinate: Celebrity VFNT, Carnival VFNT, Surefire VF1, President VFNT,

Merced VF1F2ST, Heatwave VF1F2SA

<u>Spring: Indeterminate:</u> Champion VFNT, Quick Pick VFNT, Early Girl VFF, First Lady VFNT, Superfantastic VFN, Park's Whopper Improved VFFNT

Fall: Determinate: Surefire VF1, Heatwave VF1F2SA

TOMATOES, PASTE

Fall: Indeterminate: Roma VF, San Marzano

TOMATOES, SMALL-FRUITED

Indeterminate: Porter, Cherry Grande, Sweet 100

TURNIP <u>Spring or fall:</u> Tokyo Cross, Royal Globe II, White Lady, <u>Fall only:</u> Just Right **WATERMELON**

Regular: Crimson Sweet, Sugar Baby, Royal Sweet, Orange Golden, Star Brite Triploid or seedless (transplants only): Jack of Hearts, Supersweet 5032, Tiffany

For more vegetable information see:

http://aggie-horticulture.tamu.edu/publications/guides/E-502_home_vegetable_guide.pdf

This list was developed to inform the gardener of some of the better varieties of vegetables in this area. These varieties Texas Extension in Tarrant County were selected for their productivity, their resistance to common diseases and for their adaptability to Tarrant County. Using recommended varieties will not necessarily produce the desired results. Proper watering, fertilization, weed control, etc., are also important aspects of successful gardening. Varieties are listed at random and not in order of preference.



Dallas-tx.tamu.edu / Earth-Kind vegetable gardening

Dallas County Horticultural staff Texas A&M AgriLife Extension



Jeff Raska jwraska@ag.tamu.edu























