"For thou shalt eat the labor of thine hands:
Happy shalt thou be, and it shall be well with thee."
Psalm 128:2

White Harvest Seed Company

The Basics

—What EVERY Gardener NEEDS to Know—

Includes:

--Hybrids vs. Open-Pollinated Heirlooms
--Fertilizer Elements
--Soil Temperatures for Seed Germination
--Days to Germination & Harvest
--Planting Info & Estimated Yields
--Saving & Storing Seeds

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Hybrid vs. Open-Pollinated

Hybrid — The result of deliberate crossing of two distinct parent varieties from the same species, for the purpose of combining the ideal characteristics of separate varieties into one. While at first this may sound appealing, any seed saved from an F1 hybrid will not grow the same "true to type" traits a second time. Plant breeders must deliberately cross the parent varieties every time to obtain new hybrid seed.

Open-Pollinated — These varieties, so long as they are properly isolated from other plants of their species, will produce "true to type" seed with the same traits as that of their parent plant. That is why gardeners everywhere consider OP seed to be irreplaceably important, for it allows them to produce their own seed supply.

Heirlooms — Open-Pollinated varieties, which have produced true-to-type for over 50 years, that are known for their superior flavor, uniqueness, and importance in maintaining genetic diversity that either pre-date or are unaltered by modern breeding work.

GMO — Genetically Modified Organisms (GMOs) are varieties which have had genes from another species artificially implanted into their DNA, creating a genetic trait that would not have existed in nature. Certain GMO crops have been known to pass their modified genes onto other plants within the species and the inability to completely control this dispersal is one of the many concerns about GMO seed.

Sources for these Nutrients…

*Before heading to the store, you may find you have some natural sources right outside your home. Decayed leaves, grass, manure, and compost will supply you with organic fertilizer of the best kind!

*Crop rotation is another natural method for feeding the soil. Cover crops and legumes are two examples of helpful plants.

*You can also find fertilizer mixtures already pre-made at your local department store, nursery, or feed store. Read the label carefully to verify which elements are included.

Fertilizer Elements

Here's the *Dirt* on what to expect

Boron (B)

Aids stem and root growth, promotes sugar and carbohydrate production, and is essential for seed and fruit development. Symptoms of Boron deficiency result in buds dying at the ends of branches. Decaying leaves and grass are a good source of Boron.

Calcium (Ca)

Establishes the plant's strength and ability to absorb nutrients and is irreplaceable for cell wall structure. It also promotes thick stems. Calcium deficiency shows itself in stunted plants and leaf tips dying and turning a purplish brown tint. This problem also contributes to blossom end rot in tomatoes, tip burn in cabbage, and brown hearts in celery.

Copper (Cu)

Fights fungal diseases while encouraging healthy leaves and flowers. Copper deficiency may result in stunted or sterile growth as well as curled, wilted, or discolored bluish-green leaves.

Manganese (Mn)

Is critical for photosynthesis and blooming. It also activates enzymes essential for healthy growth. Deficiency symptoms include slow growth, failure to bloom, and reduced fruits. It turns younger leaves pale yellow and older leaves mottled, with dark or dead spots.

Nitrogen (N)

Makes amino acids, which produces proteins for plants. Proteins encourage plant growth and help heal plants that are damaged. Nitrogen deficiency shows itself in stunted or slow growth as well as the discoloring and yellowing of plant stems and leaves. Sources of Nitrogen include environmentally safe Urea Nitrogen as well as Nitrate Nitrogen, which is produced by decomposing organic matter (compost).

Phosphorous (P)

Aids in photosynthesis by converting light energy into chemical energy. It is essential during the plant's budding, flowering, and seed production. It is also important for root growth in seedlings and has proven to reduce transplant shock when moving seedlings. Phosphorous deficiency results in dwarfed growth, with leaves curling back and turning a dull purple. New leaves may develop an intense discoloration.

Potassium (K)

Helps reduce water loss and increase drought resistance. It is also used to build cellulose and cell walls. Potassium deficiency will cause wilting, brown spotting, and susceptibility to frost and heat damage. Leaf tips will usually die first, spreading through each branch back to the main stem.

Sulfur (Su)

Contains amino acids and vitamins, making it very important in photosynthesis and in maintaining proper Ph. By lowering the Ph, which makes the soil more acidic, Sulfur helps plants absorb sufficient iron. Signs of Sulfur deficiency include new leaves turning yellow and older growth staying green.

FIRST THINGS FIRST

To guarantee your vegetables a healthy start, you must wait to plant them when the soil temperature—not just the air—is consistently warm. If seed is sown too early in the season, it may rot before getting the chance to germinate.

VEGETABLE	IDEAL SOIL TEMPERATURE FOR GERMINATION	DAYS TO GERMINATION	DAYS TO HARVEST
Beans, snap	78 to 80 F	5 to 10	48 to 60
Beans, lima	85 F	7 to 10	65 to 78
Beets	75 F	7 to 14	55 to 70
Broccoli	65 to 75 F	5 to 10	90 to 110
Brussel Sprouts	68 to 75 F	5 to 10	90 to 100
Cabbage	68 to 75 F	5 to 10	65 to 120
Cantaloupe	80 to 85 F	5 to 10	85 to 105
Carrots	75 F	12 to 18	60 to 150
Cauliflower	65 to 75 F	5 to 10	55 to 110
Celery	70 to 75 F	10 to 14	90 to 140
Collards	70 to 75 F	5 to 10	70 to 80
Corn	75 to 85 F	5 to 10	65 to 100
Cowpeas	65 F	7 to 10	70 to 90
Cucumbers	70 to 85 F	6 to 10	50 to 70
Eggplants	75 to 85	10 to 12	60 to 80
Gourds	70 to 80 F	10 to 14	125
Kale	70 to 75 F	5 to 10	50 to 70
Lettuce	65 to 70 F	6 to 10	40 to 90
Melons	80 to 85 F	5 to 10	85 to 105
Mustard Greens	70 F	5 to 10	40 to 60
Okra	80 to 85 F	7 to 14	50 to 60
Onions, bulbing	70 to 75 F	7 to 14	90 to 150
Onions, bunching	60 to 70 F	7 to 14	50 to 60
Parsnip	70 F	10 to 21	100 to 130
Peas	65 to 70 F	6 to 14	58 to 77
Peppers	78 to 85 F	7 to 14	60 to 80
Pumpkins	70 to 75 F	7 to 10	100 to 120

Under good growing conditions, these are the estimated germination and harvest dates for your vegetables. Keep in mind, of course, that these figures may vary greatly according to variety.

VEGETABLE	IDEAL SOIL TEMPERATURE FOR GERMINATION	DAYS TO GERMINATION	DAYS TO HARVEST
Radishes	65 to 70 F	3 to 7	20 to 40
Rutabaga	65 to 70 F	7 to 15	90
Spinach	70 to 75 F	7 to 14	40 to 50
Squash, summer	75 to 85 F	7 to 14	50 to 60
Swiss Chard	70 to 75 F	7 to 14	28 to 42
Tomatoes	75 to 80 F	7 to 14	60 to 100
Turnips	65 to 70 F	4 to 14	40 to 70
Watermelon	75 to 85 F	7 to 14	65 to 95

Estimated Yields

VEGETABLE	PER 10' ROW	# FT PER PERSON	# PLANTS PER PERSON
Beans	6 to 10 lbs.	20	20
Beans, Lima	2 lbs.	10	10
Beets	10 lbs.	5	20
Broccoli	8 lbs.	5	3 to 4
Cabbage	20 lbs.	5	3 to 4
Carrots	10 lbs.	10	30 to 60
Corn	10 to 13 ears	10	10 to 15
Cucumbers	10 to 12 lbs.	2 to 3	1 to 2
Lettuce	7 to 8 lbs.	1.5	5
Spinach	7 to 8 lbs.	5	20
Melons	10 fruits	5	1 to 2
Onions	7 lbs.	5	15
Peas	(pod) 6 lbs. (shelled) 3 lbs.	10	20
Peppers	12 lbs.	10 to 15	6 to 10
Squash	27 to 30 lbs.	Summer - 5 Winter - 10	Summer - 1 to 2 Winter - 3
Tomatoes	28 lbs.	10	3 to 5
Watermelon	7 fruits	10	1

Getting Started

Simple Steps to Success

While many varieties can be seeded directly into your garden, others require a sooner start inside. A little extra organization, especially in the beginning, will make ALL the difference in your garden. Once you fully understand the importance of these "minor" details, you'll be prepared to get your garden off on the best foot possible!

THE CONTAINER

While bio-degradable pots are extremely convenient, there are many other affordable options that will work just as well. Look around your house for any extra cups or flowerpots laying around. What you must pay attention to is that the container is no less than 3" deep. The seedling's first roots will need proper space to grow, so you don't want anything too shallow. Your containers must also have good drainage holes in the bottom in order to save your seeds from getting waterlogged. If you secure this, your seeds will find themselves in a home away from home.

THE SOIL

The soil is an underestimated key element to bedding your seed properly, particularly your indoor seedlings. You will find multiple choices of already-mixed soil-less combinations at any local garden center. A good soil-less mix can be made from 50% peat moss and 50% vermiculite. Potting soil, mixed with 50% peat moss, will also do the trick. You don't want a texture too heavy and compact or the seeds won't have the strength to sprout within such an environment. Because of this, garden dirt is typically not recommended.

NOTE: Be sure to allow a transition period beforehand for your plants to gradually adjust to their new environment – a process gardeners call Hardening Off. Set your trays outdoors in indirect sunlight during the day – protected against strong wind and heavy rain – and bring them inside at night. After a week of this practice, your plants should be officially ready to transplant.

THE TEMPERATURE

For ideal germination, the temperature of your soil must be consistently warm. A propagation mat or hot pad provide sufficient heat. At the very least, a really warm spot, such as the top of your refrigerator, may suffice.

THE MOISTURE

Moisture is also important from the get-go. When planting, first moisten your soil with enough water that a small drop of water could be squeezed out of it. Once the seeds are sown, cover immediately with plastic to keep in the moisture. At this stage, we usually spray ours with a soft mist from a water bottle. Once they've sprouted, set them in a tray of room-temperature water and water them from beneath. This method seems to put less stress on the plants and keeps you from drowning your seed or causing them to rot.

THE LIGHT

Light is another factor that is essential for your plants once germination has begun. Light from the nearest window can offer a decent amount; however, the seedlings will likely gravitate towards the light, so be sure to turn your trays around every other day. A fluorescent grow light, suspended in the air 3-4" directly above the plants, will also encourage proper growth. Generally, 16 hours of light is recommended, followed by 8 hours of darkness.

THE FERTILIZER

Fertilizing young seedlings has been known to largely improve the overall health of plants. Check at your local garden center for a good selection of fertilizers. Houseplant food, fish emulsion and compost tea are all widely used forms. Just make sure to dilute with 50% water for the first week or two. As you feed weekly, gradually work up to full strength.

White Harvest Seed Company is a home-grown business rooted in offering staple varieties of heirloom vegetable seeds to encourage gardeners to return to a simpler, more self-sufficient way of life.

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VEGETABLE	GOOD COMPANIONS	BAD COMPANIONS
BEANS	Carrots, Marigolds, Cucumbers, Strawberries, Corn, Tomatoes, Cowpeas	Onions, Garlic, Kohlrabi, Sunflowers
BEETS	Bush Beans, Onions, Lettuce, Cabbage	Pole Beans
BROCCOLI	Dill, Celery, Sage, Chamomile, Potatoes, Beets, Onions	Tomatoes, Pole Beans, Strawberries
CABBAGE	Onions, Potatoes, Celery, Peppermint, Garlic, Peas, Beets, Cucumbers, Lettuce, Spinach	Strawberries, Tomatoes, Basil
CARROTS	Onions, Tomatoes, Leaf Lettuce, Chives, Radishes, Peppers, Beans, Cabbage, Peas, Brussel Sprouts, Cowpeas	Dill
CAULIFLOWER	Celery	Tomatoes, Strawberries
CORN	Potatoes, Peas, Beans, Cucumbers, Gourds	Tomatoes
CUCUMBERS	Corn, Beans, Peas, Radishes, Sunflowers, Tomatoes, Cowpeas	
GOURDS	Celery, Corn, Melons, Onions, Radishes	
LETTUCE	Onions, Strawberries, Cucumbers, Carrots, Radishes, Tomatoes	
LIMA BEANS	Beans, Cucumbers, Corn, Celery, Potatoes, Summer Savory, Sunflowers	Onions, Beets, Kohlrabi
MELONS	Corn, Sunflowers, Okra, Gourds	Potatoes
OKRA	Melons, Cucumbers, Peppers, Eggplants	
ONIONS	Cabbage, Beets, Strawberries, Tomatoes, Lettuce, Gourds	Peas, Beans
PEAS	Carrots, Turnips, Radishes, Cucumbers, Corn, Beans, Potatoes, Celery, Eggplants, Spinach, Peppers	Onions, Garlic, Gladiolas
PEPPERS	Basil, Okra, Tomatoes	

When a person understands what

Companion Planting

really means, it shows in the harmony of their garden. Grow these veggies with their "friends" for a truly successful crop!

VEGETABLE	GOOD COMPANIONS	BAD COMPANIONS
RADISHES	Beans, Tomatoes, Melons, Squash, Cucumbers, Spinach, Beets, Gourds, Cowpeas, Carrots	Hyssop
SQUASH	Radishes, Nasturtiums	
TOMATOES	Chives, Onions, Carrots, Garlic, Roses, Lettuce, Asparagus, Basil, Radishes	Potatoes, Fennel, Corn
WATERMELONS	Potatoes	No Tall Plants (Needs Full Sun)

White Harvest's Basic Planting Guide

SPRING PLANTING

Vegetable Seed	Start Indoors Before Last Frost	Sow Directly In Garden	Seed Depth	Plant Spacing After Thinning	Row Spacing
Beans, bush		2 weeks after Last Frost	1 1/2"	3 to 6"	18 to 36"
Beans, pole		2 weeks after Last Frost	1 1/2"	6 to 8"	24 to 36"
Beets	4 to 6 weeks	3-4 weeks before Last Frost	1/2"	2 to 4"	12 to 18"
Broccoli	4 to 6 weeks	4 weeks before Last Frost	1/4" to 1/2"	18 to 24"	24 to 36"
Cabbage	4 to 6 weeks		1/2"	12 to 24"	18 to 36"
Carrots		4 weeks before Last Frost	1/4"	2 to 3"	12 to 18"
Cauliflower	4 to 6 weeks	4 weeks before Last Frost	1/4" to 1/2"	12 to 24"	24 to 36"
Celery	10 weeks	2-3 weeks before Last Frost	1/4"	8 to 10"	18 to 24"
Chard	2 to 4 weeks	2 weeks before Last Frost	1/2"	4 to 8"	18"
Collards	4 to 6 weeks	4 weeks before Last Frost	1/4" to 1/2"	16 to 18"	18 to 30"
Corn		2 weeks after Last Frost	1"	10 to 12"	30 to 36"
Cowpeas		1-2 weeks after Last Frost	1/2" to 1"	6 to 8"	18 to 36"
Cucumbers	3 weeks	1-2 weeks after Last Frost	1"	8 to 12"	3 to 4'
Eggplants	8 to 12 weeks		1/4"	18 to 24"	24 to 36"
Gourds	2 to 3 weeks	1 week after Last Frost	1/2" to 1"	2 to 3 per hill	8'
Kale	4 to 6 weeks	4 to 6 weeks before Last Frost	1/4" to 1/2"	16 to 18"	18 to 30"

Vegetable Seed	Start Indoors Before Last Frost	Sow Directly In Garden	Seed Depth	Plant Spacing After Thinning	Row Spacing
Lettuce, head	2 to 6 weeks	2 weeks before Last Frost	Barely cover	6 to 12”	
Lettuce, leaf	2 to 6 weeks	2 weeks before Last Frost	Barely cover	4 to 8”	
Lima Bean, bush		1 to 2 weeks after Last Frost	1” to 1 1/2”	3 to 6”	18”
Lima Bean, pole		1 to 2 weeks after Last Frost	1”	3 to 6”	24”
Melons	3 weeks	2 weeks after Last Frost	1/2” to 1”	36”	6’
Mustard		3 weeks before Last Frost	1/4” to 1/3”	3”	1’
Okra		2 weeks after Last Frost	1/2” to 1”	12 to 18”	24 to 30”
Onions	10 to 12 weeks	4 to 6 weeks before Last Frost	1/4”	3 to 6”	18”
Parsnip	2 to 4 weeks	4 weeks before Last Frost	1/2”	8”	18”
Peas		4 to 6 weeks before Last Frost	1” to 2”	2 to 4”	3 to 4’
Peppers	8 weeks	2 to 3 weeks after Last Frost	1/4” to 1/2”	18 to 24”	2 to 3’
Pumpkins	2 to 3 weeks	2 weeks after Last Frost	1/2” to 1”	24”	6 to 10’
Radishes		4 weeks before Last Frost	1/4” to 1/2”	1 to 2”	12”
Rhubarb-roots		Early Spring	2”	24”	36”
Spinach		4 weeks before Last Frost	1/4”	3 to 4”	12”
Squash	3 to 4 weeks	2 to 3 weeks after Last Frost	1/2” to 1”	24”	5 to 6’
Tomatoes	6 to 8 weeks		1/4”	24 to 36”	36 to 48”
Turnips & Rutabaga		4 weeks before Last Frost	1/4” to 1/2”	4 to 6”	18 to 24”
Watermelon	4 to 6 weeks	2 weeks after Last Frost	1/2” to 1”	18” +	8’

White Harvest's Basic Planting Guide

FALL PLANTING

Vegetable Seed	Start Indoors Before First Frost	Sow Directly In Garden	Seed Depth	Plant Spacing After Thinning	Row Spacing
Beans, bush		12 weeks before First Frost	1 1/2"	3 to 6"	18 to 36"
Beans, pole		12 weeks before First Frost	1 1/2"	6 to 8"	24 to 36"
Beets		12 weeks before First Frost	1/2"	2 to 4"	12 to 18"
Broccoli	17 weeks	12-14 weeks before First Frost	1/4" to 1/2"	18 to 24"	24 to 36"
Brussel Sprouts	12 weeks		1/4" to 1/2"	18 to 24"	30 to 36"
Cabbage	19 weeks		1/2"	12 to 24"	18 to 36"
Carrots		13 weeks before First Frost	1/4"	2 to 3"	12 to 18"
Cauliflower		16 weeks before First Frost	1/4" to 1/2"	12 to 24"	24 to 36"
Chard		13 weeks before First Frost	1/2"	4 to 8"	18"
Corn		15 weeks before First Frost	1"	10 to 12"	30 to 36"
Cucumbers		14 weeks before First Frost	1"	8 to 12"	3 to 4'
Kale	15 weeks		1/4" to 1/2"	16 to 18"	18 to 30"
Lettuce, head		9 weeks before First Frost	Barely cover	6 to 12"	
Lettuce, leaf		9 weeks before First Frost	Barely cover	4 to 8"	
Melons		15 weeks before First Frost	1/2" to 1"	36"	6'
Mustard	15 weeks	3 weeks before Last Frost	1/4" to 1/3"	3"	1'
Okra		14 weeks before First Frost	1/2" to 1"	12 to 18"	24 to 30"

Vegetable Seed	Start Indoors Before Last Frost	Sow Directly In Garden	Seed Depth	Plant Spacing After Thinning	Row Spacing
Peas		13 weeks before First Frost	1" to 2"	2 to 4"	3 to 4'
Peppers	19 weeks		1/4" to 1/2"	18 to 24"	2 to 3'
Pumpkins		14 weeks before First Frost	1/2" to 1"	24"	6 to 10'
Radishes		10 weeks before First Frost	1/4" to 1/2"	1 to 2"	12"
Spinach		8 weeks before First Frost	1/4"	3 to 4"	12"
Squash		12 to 14 weeks before First Frost	1/2" to 1"	24"	5 to 6'
Tomatoes	20 weeks		1/4"	24 to 36"	36 to 48"
Turnips		10 weeks before First Frost	1/4" to 1/2"	4 to 6"	18 to 24"

Storing Seeds

Since seeds sprout when they're introduced to moisture, warmth, and light, during storage you want to keep them far from such influences. A dry, cool, and dark room is ideal. We do not recommend freezing. If stored at room temperature, seed will last 2-3 years. The seed life doubles with every 10º the temperature is lowered.

Vegetable Seed Longevity

Beans	2-4 years	**Corn**	2-3 years	**Okra**	2-5 years
Beans, Lima	3-4 years	**Cowpeas**	3+ years	**Onions**	1-2 years
Beets	3-6 years	**Cucumbers**	5-10 years	**Peas**	2-3 years
Broccoli	3-5 years	**Eggplants**	2-5 years	**Peppers**	2-3 years
Brussel Sprouts	4 years	**Gourds**	6 years	**Radishes**	3-5 years
Cabbage	4 years	**Kale**	3-5 years	**Spinach**	2-5 years
Carrots	2-3 years	**Lettuce**	2-6 years	**Squash**	2-6 years
Cauliflower	3-5 years	**Melons**	5-10 years	**Tomatoes**	3-10 years
Collards	3-5 years	**Mustard**	3-5 years	**Watermelon**	4-5 years

Note: This is an approximate list, based on the results of properly stored seed.

SAVE YOUR SEEDS - Preventing Cross-Pollination

If you're interested in saving seed from your garden, you must consider the proper steps to pollination control. If these are ignored, unwanted characteristics may result in plants grown from the saved seed. Fortunately, there are multiple methods for preventing this unwanted crossing.

Note: Unless you are planning on growing only one variety of each kind of plant, you will need to research one or more of the following practices.

-Time Isolation is based on planting varieties at alternate times. For example, plant your second variety once your first has begun to flower. It is a must that the first sets its seed before the second variety flowers. Lettuce, corn, and sunflowers favor this method.

-Bagging involves simply covering the flower heads to keep pollen out. Whatever you use for protection, it must allow air in and keep insects out. Nylon mesh bags, lightweight fabric, or bridal tulle secured snugly to the plant should work. Once the variety has finished flowering, mark the fruit with a string and uncover barrier.

-Distance Isolation is trickier for smaller gardens, but with ideal space, it also will prevent unwanted pollination. Just remember to keep in mind that nearby neighbors may also be planting conflicting varieties adjacent to yours.

Plant Isolation Distances

PLANT	ISOLATION DISTANCES	POLLINATOR
Bean	25 to 100'	self
Beet	1/2 mile	wind
Broccoli	1/2 mile	insects
Cabbage	1 mile	insects
Carrots	1500'	insects
Corn	1/2 mile	wind
Cucumber	1/2 mile	insects
Lettuce	25 to 50'	self
Melons	1500'	insects
Okra	1/2 mile	self, insects
Onion	1500'	insects
Pea	50'	self
Peppers	500'	self, insects
Squash	1/2 mile	insects
Tomatoes	25 to 100'	self
Watermelon	1/2 mile	insects

For seed-saving instructions for each vegetable, visit our website
www.whiteharvestseed.com