



Garlic

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Varieties

California Early, California Softneck, Elephant Garlic, French Mild Silverskin, Mexican Purple, New York White

Soil Preferences

Sandy or clay loams with pH range of 6.0 - 8.4 but adaptable to a wide range of soil types if properly managed.

Optimum Growing Conditions

Cool conditions during growing season. Temperatures below 40°F for 6-8 weeks required for vernalization. once vernalized, bulbing initiates when day length exceeds 13 hours and soil temperature exceeds 60°F. Adaptable to all areas able to produce onions.

Establishment Methods

Planting Method	Transplanted (field set cloves)
Optimum Time	Soil temperature at 2" depth <85°F
Seeding rate	750 - 1000
Approx seed/oz	8,500
Seeding depth	1"
Seedling spacing	3-4" in-row, two lines on 38-40" wide raised bed <i>Space elephant garlic 2-4 cloves/bed ft.</i>

Fertility/Fertilization

Rates presented as actual lbs/acre N₂, P₂O₅, and K₂O (base actual rates applied on soil test results).

Generalized rate: 100 - 80 - 80 lb/acre	
N*	100-175; 50 lbs applied at or prior to planting, remainder in 1-2 side-dressings as rapid growth begins in spring

P	75-120 banded approximately 2" below cloves at planting
K	75-100 applied with initial nitrogen application

* Ammonium nitrate is very stable and least likely to evaporate. Urea and ammonium sulfate evaporate if not incorporated.

Water/Irrigation

15 - 20". Critical stage is from time of rapid growth initiation in spring until maturity (yellowing of tops). Generally 1-2" needed per week during this period.

Pest Management

Garlic Diseases and Common Name of Fungicidal Controls

DISEASE	FUNGICIDE*	OMRI LISTED FUNGICIDE**
Botrytis	Fluopicolide, Sodium Tetraborohydrate Decahydrate	Clove, Rosemary and Thyme Oil, Hydrogen Dioxide, Neem Oil, <i>Streptomyces lydicus</i>
Downy mildew	Acibenzolar-S-Methyl, Bacillus Pumilus, Chlorothalonil, Copper Sulfate, Dimethomorph, Fenamidone, Fluopicolide, Mancozeb, Mandpropamid, Maneb, Neem Oil, Potassium Phosphite, Azoxystrobin, Pyraclostrobin, Sodium Tetraborohydrate Decahydrate	<i>Bacillus subtilis</i> , Clove, Rosemary and Thyme Oil, Copper Hydroxide, Hydrogen Dioxide, <i>Streptomyces lydicus</i>
Nematode	1,3-Dichloropropene, Chloropicrin, Metam-Potassium, Metam-Sodium, Sesame Oil	Azadirachtin
Pink root	1,3-Dichloropropene	
Powdery mildew	Pyraclostrobin, Sodium Tetraborohydrate Decahydrate, Sulfur	<i>Bacillus pumilus</i> , <i>Bacillus subtilis</i> , Clove, Rosemary and Thyme Oil, Extract of <i>Reynoutria sachalinensis</i> , Hydrogen Dioxide, Neem Oil, Potassium Bicarbonate, <i>Streptomyces lydicus</i> , Sulfur
Purple blotch	Azoxystrobin, Boscalid, Chlorothalonil, Copper Sulfate, Cyprodinil, Fenamidone, Mancozeb, Mancozeb, Maneb, Potassium Phosphite, Propiconazole, Pyraclostrobin, Pyrimethanil, Tebuconazole	<i>Bacillus subtilis</i> , Copper Hydroxide, Extract of <i>Reynoutria sachalinensis</i>

White rot	Azoxystrobin, DCNA Dicloran, Iprodione, PCNB, Tebuconazole, Thiophanate-Methyl	
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Garlic Insect Pests and Common Name of Insecticidal Controls

INSECT	INSECTICIDE*	OMRI LISTED INSECTICIDE**
Armyworms	Cypermethrin, Gamma-Cyhalothrin, Lambdacyhalothrin, Permethrin, Piperonyl Butoxide, Spinetoram, Zeta-Cypermethrin	Azadirachtin, <i>Bacillus thuringiensis</i> , Pyrethrins, Spinosad
Cutworm	Cypermethrin, Deltamethrin, Gamma-Cyhalothrin, Lambdacyhalothrin, Permethrin, Zeta-Cypermethrin	Azadirachtin, <i>Bacillus thuringiensis</i> , Peppermint and Rosemary Oil, Spinosad
Mites	Petroleum Oil	Azadirachtin, Pyrethrins
Thrips	Acetamiprid, Deltamethrin, Imidacloprid, Malathion, Petroleum Oil, Piperonyl Butoxide, Potassium Salts of Fatty Acids, Sodium Tetraborohydrate Decahydrate, Spinetoram	Azadirachtin, Kaolin, Peppermint and Rosemary Oil, Pyrethrins, Spinosad

Weeds and Common Name of Herbicidal Controls

WEED	HERBICIDE*	OMRI LISTED HERBICIDE**
Preplant incorporated	Metam-Potassium, Metam-Sodium, Paraquat Dichloride, Pendimethalin	Corn Gluten Meal
Preemergence	Bensulide, Dimethenamid-P, Ethofumesate, Flumioxazin, Oxyfluorfen, Pelargonic Acid	Cinnamon and Clove Oil, Clove Oil, D-Limonene
Postemergence	Bromoxynil, Carfentrazone-Ethyl, Clethodim, Fluazifop-P-Butyl, Glyphosate, Pyraflufen Ethyl, Sethoxydim	

* The above is a partial listing of controls intended as examples. Some labels may have been revoked since the publication of this guide. Refer to product labels for specifics and use accordingly. Ensure that products with one of the listed active ingredients are registered for the crop it is to be used on. Failure to do the above may result in crop injury, death and/or citation for law violation. Humans, animals and the environment may also be adversely affected by misuse.

** As stated in §205.206 of the National Organic Standards, pest management decisions should follow a hierarchical approach, which should be defined in a farm's organic systems plan.

Please ensure that you have followed the appropriate steps and any product to be used in certified organic production systems has been approved by your certifying agent.

Harvest

Days after planting	150-200
Normal method	Hand/machine: wind rowed with potato digger, bagged and field dried for 10-14 days
Containers	Burlap bags
Grades	U.S. #1 - uniform, free of defects and true to variety type
Packaging/Handling	Carton holding 12 1 lb packs 10 lb cartons holding 12 tube or film packs 30 lb telescope bulk cartons
Anticipated yield/acre	5,000-15,000

Transit Conditions

32°F at 65-70% RH; shelf life 6-7 months (3-4 months with common storage).

Storage

50°F at 65-70% RH; rapid sprouting enhanced at 40-50°F; prolonged storage at 40°F results in rough bulbs, witch-brooming and early maturity; storage above 65°F results in delayed sprouting and late maturity.

Comments/Production Keys

- Garlic is harvest mature when tops dry and begin to fall
- Mow or flail tops if machine harvested. Wind row to protect bulbs from sun scalding if left in field to dry
- Remove tops and roots prior to packaging or storing
- Discontinue irrigation after cloves are well filled and desired bulb size is obtained and 3-5 well formed scales surround bulbs
- Do not follow onions with garlic