

# Chinese Cabbage

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## Varieties

Brisk Green, China Express, Jade Pagoda, Michihili, Monument

## Soil Preferences

Fertile, well-drained, medium textured soils, with pH range of 6.0 - 6.5. Relatively well adapted to heavy soils.  
 Perform poorly and can experience Bo deficiency in light sands.

## Optimum Growing Conditions

- Cool days (55-70°F) with cool to cold nights (40-50°F)
- Temperatures above 75°F may cause tip burn
- Prolonged temperature of 55°F can cause bolting
- 15-20°F is normal freeze threshold

## Establishment Methods

<b>Planting Method</b>	Direct seeded or transplanted
<b>Optimum Time</b>	Spring - soil seed zone temperature >50°F Fall - soil seed zone temperature <100°F
<b>Seeding rate</b>	Raw seed - 0.5-1.5 lbs/acre at 0.25" depth Coated seed - 6-8 lbs/acre at 0.5" depth
<b>Approx seed/oz</b>	9,000
<b>Seedling spacing</b>	1-2 rows on 24-40" wide raised beds with 10-18" in-row spacing

## Fertility/Fertilization

Rates presented as actual lbs/acre N<sub>2</sub>, P<sub>2</sub>O<sub>5</sub>, and K<sub>2</sub>O (base actual rates applied on soil test results).

Generalized rate: 150 - 75 - 80 lb/acre*	
<b>N**</b>	100-130 pre-plant 25-30 lbs N/acre side-dressed at thinning (4 true-leaf stage), or at transplanting.
<b>P</b>	60-80 banded approximately 2" below seed at planting
<b>K</b>	80-100 (Potassium not normally required in most areas of Texas)

\* Use high phosphate starter solution on transplants (5 lbs 5-20-10, etc./100 gal water-8 oz/plant)

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

### Water/Irrigation

High water demand (20-30"). Uniform moisture levels required throughout growing season for Optimum yields.

### Pest Management

#### Chinese Cabbage Diseases and Common Name of Fungicidal Controls

DISEASE	FUNGICIDE*	OMRI LISTED FUNGICIDE**
<b>Alternaria leaf spot</b>	<i>Streptomyces lydicus</i>	Neem Oil
<b>Anthracnose</b>	Potassium Bicarbonate, Potassium Phosphite, Pyraclostrobin	<i>Bacillus subtilis</i> , Neem Oil
<b>Bacterial soft rot</b>		<i>Bacillus subtilis</i>
<b>Blackleg</b>	Potassium Bicarbonate, Pyraclostrobin	
<b>Black rot</b>	Acibenzolar-S-Methyl, Copper Sulfate	<i>Bacillus subtilis</i>
<b>Downy mildew</b>	Acibenzolar-S-Methyl, Azoxystrobin, Chlorothalonil, Copper Hydroxide, Copper Octanoate, Fluopicolide, Fosetyl-Al, Hydrogen Dioxide, Maneb, Mefenoxam, Potassium Bicarbonate, Potassium Phosphite, Pyraclostrobin, <i>Streptomyces lydicus</i>	<i>Bacillus pumilus</i> , <i>Bacillus subtilis</i> , Clove, Rosemary and Thyme Oil, Extract of <i>Reynoutria sachalinensis</i> , Neem Oil
<b>Nematode</b>	1,3-Dichloropronene, Choloropicrin, Metam-Potassium, Metam-Sodium, Sesame Oil	Azadirachtin
<b>Southern blight</b>	Pyraclostrobin	<i>Bacillus subtilis</i>

### Chinese Cabbage Insect Pests and Common Name of Insecticidal Controls

INSECT	INSECTICIDE*	OMRI LISTED INSECTICIDE**
<b>Aphid</b>	Acetamiprid, Bifenthrin, Diazinon, Gamma-Cyhalothrin, Imidacloprid, Lambda-Cyhalothrin, Malathion, Oxydemeton-Methyl, Petroleum Oil, Piperonyl Butoxide, Potassium Salts of Fatty Acids, Soybean Oil, Thiamethoxam	Azadirachtin, Neem Oil, Peppermint and Rosemary Oil, Pyrethrins
<b>Cabbage looper</b>	Cyfluthrin, Emamectin Benzoate, Esfenvalerate, Flubendiamide, Gamma-Cyhalothrin, Indoxacarb, Lambda-Cyhalothrin, Malathion, Methoxyfenozide, Novaluron, Permethrin, Piperonyl Butoxide, Spinetoram, Tebufenozide	Azadirachtin, <i>Bacillus thuringiensis</i> , Pyrethrins, Spinosad
<b>Diamondback moth</b>	Acetamiprid, Bifenthrin, Carbaryl, Diazinon, Emamectin Benzoate, Flubendiamide, Gamma-Cyhalothrin, Indoxacarb, Lambda-Cyhalothrin, Methoxyfenozide, Novaluron, Permethrin, Piperonyl Butoxide, Spinetoram	Azadirachtin, <i>Bacillus thuringiensis</i> , Pheromones, Pyrethrins, Spinosad
<b>Flea beetle</b>	Bifenthrin, Carbaryl, Dinotefuran, Esfenvalerate, Gamma-Cyhalothrin, Imidacloprid, Lambda-Cyhalothrin, Malathion, Permethrin, Piperonyl Butoxide, Thiamethoxam	Azadirachtin, Kaolin, Pyrethrins
<b>Mites</b>	Petroleum Oil, Soybean Oil	Azadirachtin, Neem Oil, Pyrethrins
<b>Root maggot</b>	Chlorpyrifos	Peppermint and Rosemary Oil
<b>Whitefly</b>	Bifenthrin, Cyfluthrin, Dinotefuran, Gamma-Cyhalothrin, Imidacloprid, Lambda-Cyhalothrin, Novaluron, Petroleum Oil, Piperonyl Butoxide, Potassium Salts of Fatty Acids, Soybean Oil, Thiamethoxam	Azadirachtin, Neem Oil, Peppermint and Rosemary Oil, Pyrethrins

### Weeds and Common Name of Herbicidal Controls

WEED	HERBICIDE*	OMRI LISTED HERBICIDE**
<b>Preplant incorporated</b>	Clomazone, DCPA, Napropamide, Bensulide, Trifluralin	Corn Gluten Meal
<b>Preemergence</b>	DCPA, Napropamide	
<b>Postemergence</b>	Carfentrazone, Oxyfluorfen, Paraquat, Sethoxydim, Glyphosate, Pelargonic Acid, Clethodim	D-Limonene, Clove Oil, Cinnamon and Clove Oil

\* 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

<b>Days after planting</b>	Direct seeded - 50-70 Transplanted - 35-50
<b>Normal method</b>	Hand harvested
<b>Containers</b>	Bulk wagons and bins
<b>Packaging/Handling</b>	80-85 lb WGA crates 45-54 lb 14.5" WBG crates
<b>Anticipated yield/acre</b>	15-20 tons

### Transit Conditions

32°F at 98-100% RH (freezing point 30.4°F). Shelf life - 3 weeks to 6 months.

### Comments/Production Keys

- Warm temperatures and increasing day length will cause early flowering of the heads
- Soils pH >7.8 may induce black hollow stems; Solubor (Bo) at 5-10 lbs/acre foliar applied prior to heading reduces severity
- Crop may have an allelopathic adverse effect on following crop
- High nitrogen requirements

- Shallow, horizontal rooting patterns dictates very shallow cultivation to avoid root pruning and reduced yields
- Production on light soils requires high level of management
- Better suited to early fall production in most areas of the state
- Water management very critical for stand establishment of early fall direct seeded crop