

SQUASH AND PUMPKIN

VARIETIES

Summer Squash	Zucchini:	Revenue, Dividend, Spineless Beauty, Jaguar, Puma, Independence III.
	Yellow Straightneck:	Lemondrop L, Multipick, General Patton, Monet, Liberator III.
	Yellow Crookneck:	Dixie, Prelude.
	Golden Zucchini:	Goldfinger, Golden Delight.
	Middle Eastern:	Lita, Bonita.
Winter Squash	Acorn:	Table Ace, Seneca Autumn Queen, Taybelle, Table Queen, Mesa Queen.
	Butternut:	Butternut Supreme, Nicklow's Delight, Zenith, Waltham, Early Butternut, Butterboy.
	Buttercup:	Buttercup Burgess, Autumn Cup.
	Hubbard:	Blue Hubbard.
	Spaghetti:	Vegetable Spaghetti, Tivoli.
	For trial:	Bush Delicata
	Pumpkin	Miniature:
For trial:		Sweetie Pie, We-B-Little.
Small size:		Baby Bear, Oz, Mystic Plus, Hybrid Pam, Small Sugar, Spookie.
For Trial:		Spooktacular, Pik-a-Pie.
Medium size:		Wizard, Rocket, Tom Fox, Gold Fever, Racer.
For trial:		Howdy Doody, Merlin (PMT), Jack of all Trades, Gold Standard, Gold Bullion, Neon.
Large size:		Appalachian, Connecticut Field, Gold Rush, Howden Biggie, Magic Lantern (PMT), ProGold 500.
For trial:		Autumn King, Ol' Zeb's, Trax Field, Trojan, Gold Medal, Aladdin (PMT).
Very large size:		Atlantic Giant, Big Max, Big Moon, Prize Winner.
Specialty types:		Buckskin, Fairytale, Jarradale, Rouge Vif D'Etampes (Cinderella).
Hull-less/naked seed:	Triple Treat (medium size, can also be used as a Halloween type), Snack Jack.	

PMT = Tolerant to powdery mildew

SPACING AND SEEDING

Bush Types:	Rows 4 to 6 ft. apart. Plants 18 to 24 in. apart in row. Seed: 4 to 6 lb. per acre.
Vining Types:	Rows 6 to 8 ft. apart. Plants 2 to 5 ft. apart in row. Seed: 2 to 3 lb. per acre.

FERTILIZING

Lime: To maintain a soil pH of 6.0 to 6.8.

Preplant: N, 50 lb. per acre; P₂O₅, 0 to 150 lb. per acre; K₂O, 0 to 200 lb. per acre. Adjust according to soil type, previous management, and soil test results for your state. For summer squash transplants, starter solution at the rate of 1 cup (8 oz.) per plant is recommended. See p. 3 for fertilizer type suggestions. If the transplant flat receives a heavy fertilizer feeding just prior to setting, the starter solution can be eliminated.

Sidedress N: For soils with more than 3% organic matter and following soybeans, alfalfa, or a grass-legume hay crop, no N is needed. For soils with less than 3% organic matter and the above rotation or a rotation of corn, rye, oats, wheat, or a vegetable crop, apply 30-40 lb. N per acre when the vines begin to run. For sandy soils, the preplant N application can be replaced by an early sidedressing of 40 lb. N per acre when the plants show the first set of true leaves. Then, apply the second sidedressing of 45 lb. N per acre at onset of rapid vining.

For summer squash grown from transplants on plastic mulch, the N losses from leaching are greatly reduced. For this culture system, apply 50 lb. N per acre broadcast preplant over the row just prior to laying the plastic. Sidedress 30 lb. N per acre on either side of the plastic at vining when the plant roots have reached the edge of the plastic. If you are using trickle irrigation, then apply the 50 lb. N per acre preplant, and apply 0.5 to 1 lb. N per acre daily or 3 to 6 lb. N on a weekly basis through the trickle system.

DISEASES CONTROLLED	TREATMENT	COMMENTS
Bacterial leaf and fruit spot	2 year crop rotation. Avoid fields with a history of bacterial leaf and fruit spot. We suggest 3-4 applications of copper applied at 10 day intervals beginning when fruit are approximately 4" in diameter.	Do not save seed for planting next year. All squashes and pumpkins appear to be susceptible. It is important to use uncontaminated seed.
Bacterial wilt	Use systemic and contact insecticides for cucumber beetle control.	Consult section on bacterial wilt control for cucumbers and melons.
Black rot	<p>3-4 year crop rotation.</p> <p>Bravo 500 at 2.75 to 4.25 pt. per acre. Most other chlorothalonil formulations are 2 to 3 pt. per acre for flowable and 1.8 to 2.7 lb. for dry.</p> <p>OR</p> <p>Quadris 2.08SC at 11.0 to 15.4 fl. oz. per acre.</p> <p>Cabrio EG at 12 to 16 oz. per acre.</p> <p>Summer squash only: Dithane M45 or DF or Penncozeb 75DF at 2 to 3 lb. per acre, or Dithane F45 at 1.6 to 2.4 qt. per acre.</p>	<p>Rotation with non-cucurbit crops will significantly reduce the threat of blackrot in future melon crops.</p> <p>Apply protective fungicides beginning with first vine touch within rows or at first sign of disease. Use 7-10 day application interval.</p> <p>Do not apply more than once before alternating to a fungicide with a different mode of action. 1 day PHI.</p> <p>Do not apply more than once before alternating to a fungicide with a different mode of action. See label to avoid practices that could result in crop injury. 0 day PHI.</p> <p>5 day PHI.</p>
Downy mildew	<p>Ridomil Gold Bravo at 2.0 lb. per acre. 14 day spray interval.</p> <p>OR</p> <p>Bravo 500 at 2.75 to 4.25 pt. per acre, Bravo Ultrex at 1.8 to 2.7 lb. per acre, Bravo WS at 2 to 3 pt. per acre, or Terranil of Echo at labeled rates.</p> <p>OR</p> <p>Manex at 1.2 to 1.6 qt. per acre, or Maneb 75DF or 80WP at 1.5 to 2 lb. per acre.</p> <p>OR</p> <p>Fixed copper fungicides at 7-10 day intervals.</p> <p>OR</p>	<p>0 day PHI.</p> <p>Apply protective fungicides beginning with first vine touch within rows or at first sign of disease. Use 7-14 day application interval. 0 day PHI.</p> <p>5 day PHI.</p>

DISEASES CONTROLLED	TREATMENT	COMMENTS
Downy mildew (cont.)	Aliette at 2 to 5 lb. per acre. Use 2 to 3 lb. rate when tank mixed with another fungicide labeled for downy mildew (other than copper). Otherwise use the 3 to 5 lb. rate.	12 hours PHI.
	Cabrio EG at 12 to 16 oz. per acre.	Do not apply more than once before alternating to a fungicide with a different mode of action. See label to avoid practices that could result in crop injury. 0 day PHI.
	Quadris 2.08SC at 11.09 to 15.4 fl. oz. per acre. OR	Do not apply more than once before alternating to a fungicide with a different mode of action. 1 day PHI.
	Flint at 4.0 oz. per acre. OR	Do not apply more than once before alternating to a fungicide with a different mode of action. 0 day PHI.
	For summer squash only: Dithane M45 or DF or Penncozeb at 2 to 3 lb. per acre, or Dithane F45 at 1.6 to 2.4 qt. per acre.	5 day PHI.
Plectosporium blight (Pumpkin)	3 to 4 year crop rotation.	Rotation with non-cucurbit crops.
	Cabrio EG at 12 to 16 oz. per acre. Management activities that control black rot should also control Plectosporium blight.	Do not apply more than once before alternating to a fungicide with a different mode of action. See label to avoid practices that could result in crop injury. 0 day PHI.
Powdery mildew	Resistant varieties.	Partially resistant varieties are available.
	Cabrio EG at 12 to 16 oz. per acre.	Do not apply more than once before alternating to a fungicide with a different mode of action. See label to avoid practices that could result in crop injury. 0 day PHI.
	Nova 40 W at 2.5 to 5 oz. per acre. OR	Initial applications should be made when earliest pumpkins are still green and are more than 1/2 their estimated full size (mid-late July). Repeat applications at 2 week intervals through early September. Topsin, Nova and Procure. 0 day PHI.
	Topsin 85WDG at 4 oz. per acre. 10-14 day spray interval. OR Procure 50WS at 4 to 8 oz. per acre. OR	

DISEASE CONTROL (CONT.)

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DISEASES CONTROLLED	TREATMENT	COMMENTS
Powdery mildew (cont.)	Quadris 2.08SC at 11.0 to 15.4 fl. oz. per acre. OR Flint at 1.5 to 2.0 oz. per acre.	Do not apply more than once before alternating to a fungicide with a different mode of action. 0 day PHI. Use 7-14 day interval. Do not exceed 2 consecutive applications before rotating to a fungicide with a different mode of action. 0 day PHI. The fungi which cause powdery mildew may become resistant to these systemic fungicides unless precautions are taken. Always alternate between fungicides with different modes of action. Cabrio, Flint and Quadris have the same mode of action and must never be applied back to back. Topsin has a separate mode of action. Nova and Procure have the same mode of action. See melon section.
Phytophthora root and fruit rot	Avoid fields with a history of the disease on cucurbits, peppers, or tomatoes. Summer squash only: Dithane M45 or DF or Penncozeb 75DF at 2 to 3 lb. per acre, or Dithane F45 at 1.6 to 2.4 qt. per acre.	Turban squash is extremely susceptible.
Pumpkin viruses	Pumpkin viruses are best controlled by planting early so that fruit are set before virus diseases become apparent. For example, growers in southwestern Indiana should plant by June 20.	Although most pumpkin viruses are spread by aphids, controlling aphids with insecticides is not effective for virus disease control in late season cucurbits.

HERBICIDE

TREATMENT

COMMENTS

PREEMERGENCE

Dacthal 75WP	8 lb. on light soils (less than 1.5% organic matter), 15 lb. on other soils.	Not effective on soils with greater than 5% organic matter. Apply to soil when plants have 4 to 5 true leaves. Squash only.
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* For specific weeds controlled by each herbicide, check table on page 29.

** Rates given are for overall coverage. For band treatment, reduce amounts according to the portion of acre treated.

HERBICIDE	TREATMENT	COMMENTS
<u>PREEMERGENCE (cont.)</u>		
Prefar 4E	5 qt. per acre on light-colored, sandy soils (less than 1% organic matter), 6 qt. on other soils.	Apply before seeding or transplanting, and incorporate into soil to a depth of 1 to 2 in. May be applied to the soil surface immediately after seeding in freshly worked soil if sprinkler-irrigated within 24 hours. Do not apply after transplanting.
Command 3ME	0.67 to 1.33 pt. per acre for summer squash; up to 2 pt. for winter squash.	Apply before seeding or transplanting. Do not apply to soil that will be covered with plastic mulch. See label for sensitive varieties. Not for use on jack-o-lantern pumpkins. 45 day PHI.
Curbit 3EC	3 to 4 pt. per acre.	Apply Curbit to the soil surface within 2 days after seeding of pumpkins, winter and summer squash. Do not incorporate Curbit prior to planting because crop loss will occur. See label for other restrictions.
Strategy	2 to 4 pt. per acre for squash; up to 6 pt. for pumpkins. Use lower rates on coarse soils.	Direct seeded: Apply after planting before crop emerges. Transplants: Apply after transplanting as a banded spray between rows. If no rain within 5 days of application, shallow incorporation will improve control. Do not incorporate prior to planting. Do not apply under or over plastic mulch and do not use under row covers or hot caps. Under cool temperatures may cause crop injury or failure. 45 day PHI for squash.

POSTEMERGENCE

Poast 1.5E	1 to 1.5 pt. per acre plus 1 qt. COC per acre.	Apply to actively growing grass. Maximum of 3 pt. per acre per year. 14 day PHI.
Select 2EC	6 to 16 fl. oz. for annual grasses; 8 to 16 fl. oz. for perennial grasses; plus 1 qt. COC per 25 gal. spray solution (1% v/v).	Apply to actively growing grasses. Wait at least 14 days between applications. Maximum 32 fl. oz. per season. 14 day PHI.

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WEED CONTROL (CONT.)

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HERBICIDE	TREATMENT	COMMENTS
NON-SELECTIVE HERBICIDES		
paraquat	1.6 to 3.2 pt. per acre of 2.5L or 1.3 to 2.7 pt. per acre of 3L, plus 1 qt. COC or 4 to 8 fl. oz. nonionic surfactant per 25 gal. spray solution.	Apply to emerged weeds before or after seeding, but before crop emerges. Some formulations permit postemergence directed spray - check label. RUP.
glyphosate	0.75 to 1.1 lb. acid equivalent (ae) per acre, equivalent to: 32 to 48 fl. oz. of 3 lb. ae/gal.; 26 to 40 fl. oz. of 3.7 lb. ae/gal.; 24 to 36 fl. oz. of 4 lb. ae/gal.; 1.2 to 1.8 lb. of 64.9% ae WSG.	Some formulations permit spot spray application - check label. Apply to weeds* before planting. Wait 3 days to plant. These rates are for annual weeds at application volumes of 10 to 40 gal. per acre. See label for rates at lower application volumes, for perennial weeds, and suggested adjuvants.

* For specific weeds controlled by each herbicide, check table on page 29.

** Rates given are for overall coverage. For band treatment, reduce amounts according to the portion of acre treated.

INSECTS CONTROLLED	TREATMENT	COMMENTS
Cucumber beetles	<i>Apply at planting (either at seeding or time of transplanting).</i> Admire 2F at 16 to 24 fl. oz. per acre. Furadan 4F at 2.4 fl. oz. per 1000 linear feet of row.	Apply pre-plant in a 2 inch or smaller band, as an in-furrow spray at planting, as a post-plant drench, as a sidedress application, or through trickle irrigation water. Do not exceed 24 fl. oz. per acre per season. 21 day PHI. Apply directly into seed furrow or as a 7-inch band over the row. This application is for seeding protection and beetle control after seedlings emerge or as transplants become established. Indiana and Illinois only.
Cucumber beetles, squash vine borer, squash bug	<i>Use when insects exceed threshold.</i> Pounce 3.2EC at 4 to 8 oz. or 25WP at 6.4 to 12.8 oz. per acre. OR Ambush 2E at 6.4 to 12.8 fl. oz. or 25WP at 6.4 to 12.8 oz. per acre. OR	Apply insecticides when squash bug eggs begin to hatch. Larger nymphs and adults are very difficult to control. Apply in minimum of 4 gal. finished spray per acre by air or 20 gal. finished spray per acre by ground equipment. Do not exceed 1.6 lb. a.i. per acre per season. Use high rate for squash bugs. 0 day PHI.

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INSECT CONTROL (CONT.)

INSECTS CONTROLLED	TREATMENT	COMMENTS	
<div style="border: 1px solid black; border-radius: 15px; padding: 10px; background-color: #f0f0f0;"> <p>Thresholds</p> <p><i>Cucumber Beetle</i> 5 beetles/plant</p> <p><i>Squash Bug</i> 1 egg mass/plant through</p> </div>	Cucumber beetles, squash vine borer, squash bug (cont.)	Capture 2EC at 2.6 to 6.4 fl. oz. per acre. Do not exceed 19.2 fl. oz. per acre per season. 3 day PHI.	
		OR	
		Asana XL at 5.8 to 9.6 fl. oz. per acre. Do not exceed 0.25 lb. a.i. per acre per season. 3 day PHI.	
		OR	
		Lannate LV at 1.5 to 3 pt. per acre. Summer squash only. Will also control aphids. PHI: 1.5 pt. - 1 day, more than 1.5 pt. - 3 days.	
		OR	
		Thiodan, Endosulfan, or Phaser 50WP at 2 lb. per acre. 2 day PHI.	
		OR	
		Sevin 50WP at 2 lb. per acre, or Sevin XLR Plus at 1 qt. per acre. Cucumber beetles only. Apply as soon as plants emerge, and repeat as needed. 3 day PHI.	
		OR	
	Methoxychlor 3EC at 2 to 6 qts. per acre. Cucumber beetles only. 7 day PHI.		
	OR		
	Sabadilla according to label directions. 1 day PHI.		
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Aphids, leafhoppers		Virus diseases carried by aphids cannot be prevented by killing aphids with insecticides.	
	Admire 2F at 16 to 24 fl. oz. per acre.	Apply pre-plant in a 2 inch or smaller band, as an in-furrow spray at planting, as a post-plant drench, as a sidedress application, or through trickle irrigation water. Do not exceed 24 fl. oz. per acre per season. 21 day PHI.	
	Capture 2EC at 2.6 to 6.4 fl. oz. per acre. Do not exceed 19.2 fl. oz. per acre per season. 3 day PHI.		
	OR		
	Pounce 3.2EC at 4 to 8 oz. or 25WP at 6.4 to 12.8 oz. per acre. Do not exceed 1.6 lb. a.i. per acre per season. Minimum volume of 20 gal. per acre on ground, or 4 gal. per acre by air. 0 day PHI.		
	OR		
	Diazinon 50WP at 1 to 1.5 lb. or AG500 at 1 to 1.5 pt. per acre. Not for pumpkins or winter squash. One application per season. 7 day for summer squash.		
	OR		
	Fulfill 50 WG at 2.75 oz. per acre. Aphids only. Do not exceed 5.5 oz. per acre per season. 0 day PHI.		
	OR		

INSECT CONTROL (CONT.)

SQUASH AND PUMPKIN

INSECTS CONTROLLED	TREATMENT	COMMENTS	
Aphids, leafhoppers (cont.)	Metasystox-R 2EC at 1.5 to 2 pt. per acre.	Aphids only. One application per season. 3 day PHI for summer squash, 14 day PHI for winter squash and pumpkin.	
	OR		
	Lannate LV at 1.5 to 3 pt. per acre.	Summer squash only. PHI: 1.5 pt. - 1 day, more than 1.5 pt. - 3 days.	
	OR	Ground application only. Not for pumpkin. 1 day PHI.	
	Malathion 57EC at 2 pt. per acre.		
	OR	Aphids only. Must contact aphids to be effective. 0 day PHI.	
	M-Pede at 1 to 2% by volume.		
	OR	Aphids only. Do not exceed 8 oz. per acre per season. 0 day PHI.	
	Actara 25 WDG at 2-3 oz. per acre.		
	Mites	Capture 2EC at 5.12 to 6.4 fl. oz. per acre.	Do not exceed 19.2 fl. oz. per acre per season. 3 day PHI.
OR			
Kelthane 35WP at 1 to 1.67 lb. per acre.		2 day PHI.	
OR		Do not exceed 48 fl. oz. per acre per season. 7 day PHI.	
Agri Mek 0.15EC at 8 to 16 fl. oz. per acre.			
Whiteflies	Admire 2F at 16 to 24 fl. oz. per acre.	Apply pre-plant in a 2 inch or smaller band, as an in-furrow spray at planting, as a post-plant drench, as a sidedress application, or through trickle irrigation water. Do not exceed 24 fl. oz. per acre per season. 21 day PHI.	
	Capture 2EC at 5.12 to 6.4 fl. oz. per acre.		Do not exceed 19.2 fl. oz. per acre per season. 3 day PHI.
	OR		0 day PHI.
	Align or Neemix according to label directions.		Must contact whiteflies to be effective. 0 day PHI.
	OR		
M-Pede at 1 to 2% by volume.	0 day PHI.		
OR			
	Actara 25 WDG at 3 to 4 oz. per acre.	Do not exceed 8 oz. per acre per season. 0 day PHI.	