

How are we going to battle against the spotted cucumber beetle this year?

He is actually quite a beautiful bug, but the spotted cucumber beetle does more than just physical damage. He transmits Bacterial Wilt, Cucumber Mosaic Cucumovirus, Maize Chlorotic mottle Machloroviruses, Bean Mild Mosaic Carmovirus Cowpea Mosaic Comovirus, and Squash Mosaic Virus. The larva of this little yellow guy (called southern corn root worm), eats the roots of corn, grasses, small grains, soybeans and sweet potatoes.

Let's understand our adversary a little more so we can be prepared to do battle.

The cucumber beetle overwinters as unmated adults in plant vegetation, debris, wood lots, and fence rows. This is the reason right here, why it is so important to clean up your garden at the end of the season. If you don't, you are harboring the enemy, and all of the hundreds of babies to come.

When spring arrives and the temperatures reach 55-65°F the cucumber beetle become active. Ok, this is really still winter in Texas. This is happening around February. He munches down on over 200 various plants while waiting for the prized cucurbit cultivars. Not so cute any more is he!

Alert females feed on the cucurbit seedlings and deposit 200 to 300 eggs, in the soil, at the base of the cucurbit plant over the course of the next few weeks. The eggs need moisture for 24 to 72 hours to hatch, and in 5 to 10 days the larva is chewing up your crops. Then it is off to adult hood in about 1-1/2 to 2 months. Every 30 to 60 days a new generation can emerge.



This is the spotted cucumber beetle (*diabrotica undecimpunctata howardi*) has 12 spots on it's wing covers, a black head and a lime green thorax.

The second step in an Integrated Pest Management System for these little guys is to **delay your first planting** of cucurbits. This way you miss the onslaught of the first heavy wave of bugs.

The next recommended step is to use **floating row covers**. This protects your crop from the beetles even entering in your fields if they did not overwinter there, or are not already in the soil. Cucumber beetles are very strong fliers. Cucumber beetles migrate to the northern states in June and July. If your crop is covered they most likely will not be blown in or fly in.

Trap crops, trap baits and sticky traps use smell color and pheromonal attraction. Trap crops release chemicals, kairomones, that are really attractive to insects. Cucurbitacin is the bitter substance in kairomones that drives cucumber beetles crazy. Between the smell of the cucurbit blossoms and the kairomones the cucumber beetles just goes on a feeding frenzy. A trap crop is used to draw attention away from the main crop. The beetles will feed on the select trap crop and then you can hand pick, vacuum, use sticky traps, insecticides or combinations of the above to eradicate them.

Trap crops are most effective when used on the perimeter of the entire field of squash.

Cornell also found that *cucurbit maxima* and *cucurbit pepo* are best used for trap crops.

BEST VARIETIES FOR TRAP CROPS

Black Jack zucchini

Big Max pumpkin

Cocozelle summer squash

Green Eclipse zucchini

Seneca zucchini

Senator zucchini

Baby Boo pumpkin

Super Select zucchini

Ambercup buttercup squash

Dark Green zucchini

Embassy Dark Green zucchini

Caserta summer squash

Classic melon

Trap crops are generally used in combination with other methods

such as hand picking, or insecticides. Once the pest is feeding on the desired host plant, then you pick them off or spray with insecticide. Or trap them with sticky traps. If spraying so not spray in the afternoon when you can harm beneficial honey bees that can be out pollinating. The sticky traps have been very successful here in this application as well as the pheromone lures. You must be careful with insecticides even if they are organic. It does not give you free reign to use them liberally. Some will still harm beneficial insects and honey bees and all will harm beneficial bacteria. It will throw your garden off kilter. Work on making your garden healthier and save chemicals as a last resort please. I am off my soap box now.

Particle Film Barriers such as kaolin clay offer some protection for the organic grower. Kaolin clay is an anti-caking agent used in toothpaste and other ingredients. It was accepted onto the OMRI list in 2000. It acts as a barrier between the pest and the plant by forming a film.

CUCUMBER BEETLE FEEDING PREFERENCE

HIGHER RANKING NUMBERS INDICATE VARIETIES MORE PREFERRED BY CUCUMBER BEETLES. 1-14 IS NOT PREFERRED BY

Because there is a film the pest sometimes has a hard time locating the plant. Remember to reapply after a heavy rain (not likely to happen here anytime soon). Agitate often. Spray well under the leaves. Wipe produce off with a damp cloth before market.

Plant trap crops two weeks earlier than the rest of cucurbits.

By planting the trap crop first, the cucumber beetles will come after it first. This gives you a chance to concentrate on killing them before they eat the rest of your crops for lunch.

Mulching with straw, hay or paper

deters females from laying eggs at the base of the plant. Not all mulches are created equal in this respect. Straw mulch is so favorable because it is a good habitat for wolf spiders and ground beetles. They are very effective for controlling cucumber beetles. It works two fold in this respect, to bring in the predators, mulch to keep the females from laying eggs and keep the moisture in. Some mulches are actually beneficial in habitat to the beetle.

Crop rotation is another very important aspect of integrated pest management. The crop rotation for cucumber beetles must be from plots very far away from each other as they are very good fliers. You must rotate the crop with over wintering bugs or as you have seen from the life cycle when they come out of their slumber, they are on the attack. If you have the same cop in the same field and heaven forbid if you mono-crop you are doomed.

Insect vacuuming is effective with new systems that are beneficial friendly such as the D-Vac. It vacuums the bugs off just like you would vacuum your floor, and it is carried on your back.

SUMMER		WINTER	
VARIETY	RANKING	VARIETY	RANKING
YELLOW		ACORN	
Sunbar	1	Table Ace	6
Slender Gold	2	Carnival	7
Early Prolific Straightneck	20	Tale King Bush	12
Goldie Hybrid	32	Tay Belle	14
Sundance	33	BUTTERNUT	
STRAIGHTNECK		Zenith	13
Seneca Prolific	4	Butternut Supreme	16
Gold Bar	5	Early Butternut	25
Multi Pic	37	Waltham	28
CROOKNECK		BUTTERCUP	
Yellow Crookneck	8	Honey Delight	43
Sundance	34	Buttercup Burgess	44
SCALLOP		Ambercup	55
Peter Pan	9	PUMPKINS	
ZUCCHINI		Baby Pam	10
Gold Rush	39	Munchkin	11
Zucchini Select	40	Seneca Harvest Moon	15
Ambassador	41	Jack-Be-Little	17
President	45	Jackpot	18
Green Eclipse	50	Tom Fox	19
Seneca Zucchini	51	Baby Bear	21

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SUMMER		WINTER	
VARIETY	RANKING	VARIETY	RANKING
ZUCCHINI		PUMPKINS	
Senator	52	Howden	22
Dark Green Zucchini	54	Spirit	23
Embassy Dark Green Zucchini	56	Wizard	24
OTHER SUMMER SQUASH		Ghost Rider	26
Scallop	3	Big Autumn	27
Cocozelle	48	Autumn Gold	29
Caserta	58	Jack-Of-All Trades	30
MELON		Rocket	31
Classic	59	Frosty	35
		Spookie	36
		Connecticut Field	38
		Happy Jack	42
		Big Max	47
		Baby Boo	53

Predators and Parasites are a great way to control cucumber beetles. Carabid beetles, Soldier beetles, hunting spiders, web weaving spiders, tachinid flies, braconid wasps, bats, entomopathogenic fungi, and nematodes. I saw the numbers of cucumber beetles decrease in my garden this spring when the tachinid flies came out in full force. This can be done by having small flowering plants that are in the carrot family for the flies and wasps. Let a carrot go to seed from the fall as well as broccoli they love them as well. Dill, fennel and cilantro and chervil are all good choices as well. Provide low growing ground cover for the beetles to run into and hide. That is what makes them happy. Spiders like somewhere to hang out in as well. There is still nothing as good as a hedge row if you have room. If not improvise and plant same taller herbs in a strip around the edge in your garden for the good guys to have some shelter in.

After harvesting you must **cultivate deeply**. In the world of organics, that means crop residue shredding with compost/manure addition and planting of a **winter cover crop**. This insures your crop safety for next year by burying deeply and and killing any left over beetles in the residue.

In conclusion, there is not one single thing you can do that will control this ornery pest. But you can control him with minimal damage by following the complete Integrated Pest Management System. It is all about doing a lot of little things right. Crop Rotation, Companion Planting, disease resistant varieties and beneficial insects will help all gardens. Insects are attracted to plants that are low in nitrogen and are weak. So build healthy soil. Good luck and let me know how it turned out this year I like to hear all of your triumphs and trials.