

PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION \$1.50

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INSIDE

Prevent Vegetable Diseases with Good Cultural Practices	1
Postemergence Herbicide Crop Tolerance	2
Vegetable Weed Control	3
Cucurbit Weed Control	4
IPM Update	6
Pest Notes	6
Weekly Weather Summary	7

Prevent Vegetable Diseases with Good Cultural Practices

Michelle Infante-Casella, Gloucester County Agricultural Agent

Often we rely on chemical methods to control vegetable diseases in the field. Many cultural steps can be practiced to reduce the incidence of diseases. These steps should be considered and utilized in combination with chemical controls. If you are diligent about practicing good cultural methods, reliance on chemicals may be reduced. Using the best cultural practices will promote healthy plant growth; thus, plants may overcome the threat of some diseases. The following methods are examples of general cultural practices that will aid in preventing vegetable diseases.

Prevention of Foliar Diseases

- Stake and prune plants to increase air movement and leaf drying
- Always work in fields when plants are dry to avoid spreading disease manually
- Make sure to clean and disinfect stakes and stringing sticks before reuse
- Wider row spacing can be used to increase leaf drying and air movement, and can be especially useful for late season crops when foliar diseases are more of a threat
- Use overhead irrigation in the morning hours so leaves dry quickly after irrigation
- Use drip irrigation to prevent leaf wetness and spread of disease from water splash
- Use plastic mulch or organic mulches like straw to prevent soil splash up into the plant
- Plant natural windbreaks or use synthetic windbreaks to reduce the spread of airborne spores in high winds
- Consider using a boom sprayer rather than an air-blast to reduce spreading airborne spores

Prevention of Root and Crown Rots

- Use raised beds to improve water drainage in root zone
- Chisel plow or subsoil to break up hard pans to increase percolation
- Use careful cultivation in planted crops to aerate the soil for healthy root growth

SEE DISEASE PREVENTION ON PAGE 2

DISEASE PREVENTION FROM PAGE 1

- Do not till fields when wet to prevent clodding and compaction
- Do not over irrigate fields, use soil moisture monitoring methods, like tensiometers, to apply correct amounts of water for crop needs
- Create cross ditches to allow for drainage of standing water in low areas of the field
- Cultivate rows to the end of the field and contour field ends for water runoff out of the field
- Increase organic matter levels in soil by intensive cover cropping, leaf application, or other methods

Prevention of Viral Diseases

- Use floating row covers as a barrier when feasible to reduce insect vectors
- Reflective mulches can be used to repel some insect pests in the field
- Practice good weed control since some weeds carry plant diseases that are diseases of vegetable crops
- Scout fields for insect vectors and use trapping methods like yellow sticky cards for aphids

Prevention of Post Harvest Diseases

- Handle harvested produce gently to avoid cuts and bruises that act as entry points for bacteria and fungi
- Use plastic containers rather than wood containers that may contain wires, staples, or splinters that will injure the harvested crop
- Clean harvest containers to keep free of plant debris and soil
- Use padded bulk bins and pad areas on packing/grading belts to soften the blow when dumping produce
- Cool harvested product rapidly to slow microbial activity that cause rot
- Use proper storage temperatures and humidity levels
- Frequently clean and disinfect trailers or containers that the produce is shipped in

Other General Disease Prevention Methods

- Soil test and apply proper lime and fertilizer rates to reduce plant stress and avoid excessive soft growth that is more susceptible to diseases
- Be dedicated to and practice proper crop rotations to reduce disease inoculum buildup in fields
- Incorporate previous crop residues to promote rapid breakdown of plant material
- Wash equipment and tractors frequently to reduce the spread of diseases from field to field
- Use proper planting dates that will promote healthy plant growth

*Some information in this article was derived from NRAES Publication 104, *Sustainable Vegetable Production from Start-Up to Market*, by Vernon P. Grubinger. □

Postemergence Herbicide Crop Tolerance

Bradley A. Majek, Ph.D., Specialist in Weed Science

The recent extended period of cloudy weather and high soil moisture may have resulted in certain crops growing rapidly and developing a thinner than “normal” wax layer, called the cuticle, on the leaves. This thinner cuticle is more easily penetrated by postemergence herbicides. Warm temperatures during the cloudy moist period will increase the speed of growth and the thinness of the cuticle.

To reduce the risk of crop injury from postemergence herbicides this week:

1. Reduce the amount of spray additives used to the minimum labeled amount.
2. Use nonionic surfactants instead of oil concentrates when the herbicide label gives you a choice.
3. Do NOT add any surfactant, oil concentrate, or other additive if the label allows application alone.
4. Do NOT add liquid fertilizer to the spray solution, even if the herbicide label suggests it as an option.
5. Delay treatment of crops that are marginally large enough to treat according to the herbicide label.
6. Delay treatment until the crop has experienced 3 to 5 days of bright, clear, warm, and sunny weather before applying postemergence herbicides. The cuticle thickens when the weather turns warm, sunny, and dry. □

Vegetable Weed Control

Bradley A. Majek, Ph.D., Specialist in Weed Science

✓ **Cabbage:** Dual Magnum 8E has received special state labels for use to control weeds in CABBAGE. The manufacturer, Novartis, requires growers to sign an indemnification agreement that must be notarized and recorded by the Vegetable Growers Association of New Jersey for the label to be valid. Read the agreement thoroughly and fill out completely before mailing to the VGANJ for validation. Copies of the indemnification agreement are available from VGANJ or your county agent.

Use Dual Magnum to control **annual grasses** and certain **broadleaf weeds**. Weeds that Dual suppresses or controls that could not be controlled with other labeled herbicides include **yellow nutsedge, galinsoga, and nightshade**.

In transplanted cabbage, apply Dual at 0.5 to 1.33 pints per acre (0.48 to 1.27 lb ai/a) pre transplant or post transplant within 48 hours of planting. Do NOT incorporate pre transplant applications. Use Dual Magnum with caution. Some temporary stunting may occur that could delay maturity.

In direct-seeded cabbage, do NOT apply Dual at planting. Use other labeled herbicides to control weeds as the cabbage emerges. Apply Dual at 0.5 to 1.33 pints per acre (0.48 to 1.27 lb ai/a) after the cabbage has developed 3 to 4 leaves to control weeds for the remainder of the season. Control emerged weeds by cultivation and hoeing or with postemergence herbicides before applying Dual Magnum. Use Dual magnum with caution. Some temporary stunting may occur that could delay maturity.

The label, validated through the VGANJ, is effective for this growing season, and expires at the end of the year.

✓ **Peppers:** Recent cold weather may result in abnormal growth of peppers during the next few weeks. Low temperatures can injure tiny leaves in the growing points. When these leaves grow out in a few weeks, they may exhibit a variety of epinastic responses that resemble virus or 2,4-D drift injury. Leaves may be crinkled, stretched, the midvein may be shortened, and/or the leaves may appear otherwise abnormal. The response can be very variable. The plant will outgrow the problem in time.

Dual Magnum has a special state label for use to control weeds in BELL PEPPERS. The label is valid only in New Jersey. The manufacturer, Novartis, requires growers to sign an indemnification agreement that must be notarized and recorded by the Vegetable Growers Association of New Jersey for the label to be valid. Read the agreement thoroughly and fill out completely before

mailing to the VGANJ for validation. Copies of the indemnification agreement are available from VGANJ or your county agent.

Use Dual Magnum to control **annual grasses** and certain **broadleaf weeds**. Weeds that Dual Magnum suppresses or controls that could not be controlled with other labeled herbicides include **yellow nutsedge, galinsoga, and nightshade**.

- Apply Dual Magnum at 0.67 to 1.0 pints per acre (0.6 to 1.0 lb ai/a) pre transplant or post transplant as a basal-directed spray. Read and follow all label instructions and restrictions.
- Do NOT incorporate pre transplant applications.
- Do NOT spray posttransplant applications “over the top” of peppers.
- Do NOT apply within 60 days of harvest.

The label, validated through the VGANJ, is effective for this growing season, and expires at the end of the year.

✓ **Sweet potatoes:** Command 4EC has received a 24C SPECIAL LOCAL NEEDS label for weed control in sweet potatoes. Apply 0.75 to 1.5 pints per acre (0.375 to .75 lb ai/a) and incorporate immediately to prevent vapor drift from damaging adjacent vegetation. Command will suppress or control many **annual grass** and **broadleaf weeds**, but will not control **pigweed, carpetweed, or yellow nutsedge**.

Apply Command 4EC when the humidity is low, winds are light, and blowing in a safe direction (away from sensitive vegetation). Do NOT spray in windy weather to avoid spray drift injury, or during calm periods when the humidity is high. Incorporate before a period of calm wind and near 100% humidity occurs to reduce the risk of vapor drift. READ AND FOLLOW ALL LABEL WARNINGS AND RESTRICTIONS. □

Cucurbit Weed Control

Bradley A. Majek, Ph.D., Specialist in Weed Science

Crops commonly grown in the cucurbit plant family include plants from three major branches of the family. The branch of each crop is called its genus. Each major branch of the family has a separate Genus name. Squash and pumpkins, including winter squash, summer squash, Halloween pumpkins, and pie pumpkins, are in the Genus called *Cucurbita*. Cucumbers and melons, including muskmelons and honeydew melons are in the Genus called *Cucumis*. Watermelons are in a genus called *Citrullus*. Crops from the different branches of the cucurbit family often do not have the same tolerance for certain herbicides. Crops from the same branch of the family usually have similar tolerance to herbicides.

The herbicides available for controlling weeds in Cucurbit crops are Prefar 4EC (bensulide), Alanap 2SC (naptalam), Command 3ME (clomazone), Curbit 3EC (ethalfluralin), and Poast 1.5EC (sethoxydim). Strategy is a jug-mix of clomazone and ethalfluralin. Amiben 2SC (chloramben) was used for **broadleaf weed** control in cucurbit crops in the *Cucurbita* Genus, including summer and winter squash, and pumpkins, but is no longer available.

Prefar 4EC is one of the few herbicides labeled for use in all cucurbit crops. A characteristic of Prefar has been excellent crop safety during a variety of weather conditions. The herbicide controls **annual grasses** and suppresses or controls a few **broadleaf weeds**, but use of Prefar alone may result in annual grass control and problems with certain broadleaf weeds. The label permits applications to be made preplant incorporated or preemergence. Local research has indicated that preemergence treatments applied immediately after seeding and followed by one half to one inch of irrigation, provides better weed control than mechanical incorporation before seeding.

Alanap 2SC is labeled for use in cucurbit crops in the Genus *Citrullus*, which includes watermelons, and in *Cucumis*, which includes cucumbers and melons. Alanap 2SC is not labeled for squash and pumpkins, and use may result in moderate to severe stunting.

Command 4EC has been labeled for use in certain cucurbit crops in the Genus *Cucurbita*. Labels have included a section 3 (federal label) for pumpkins and a section 24C (special local needs) label for other cucurbit crops. The 4EC formulation has been discontinued and replaced with a 3ME (micro-encapsulated) formulation to reduce the risk of vapor drift. The Command 3ME label includes a long list of vegetable crops, including cucurbit crops, but specifically excludes Jack-O-Lantern pump-

kins! Existing leftover Command 4EC can still be used on Jack-O-Lantern pumpkins, and the jug-mix of Command and Curbit is labeled for use in pumpkins.

Pumpkins and winter squash are the most tolerant cucurbits to Command. Recommended rates range between 0.25 and 0.5 pounds of active ingredient per acre, or one half to one pint of Command 4EC per acre for pumpkins. Some early injury may be observed as a whitening of the edges of some of the leaves after emergence. Due to the possibility of this injury early in the season, the rate recommended for weed control in pumpkins is lower than the 1.0 pound of active ingredient rate listed on the Command 4EC label for pumpkins, and pretransplant applications are NOT recommended. Excellent control of **annual grasses** and many **broadleaf weeds** can be obtained with Command, but **pigweed** and **carpetweed** frequently escape and can cause serious problems.

Command 4EC must be applied preplant incorporated in most locations to reduce the risk of vapor drift. Incorporation must be thorough, shallow, and uniform. Deep incorporation increases the risk of crop injury and may reduce weed control. Command 4EC should not be incorporated deeper than the seed is planted. Preemergence applications cause less crop injury, and provide better weed control, but are only labeled in some states due to the risk of vapor drift of Command 4EC which may affect vegetation in adjacent fields. The optimum application technique is a preemergence application that is incorporated immediately after application about one quarter of an inch deep with rolling basket cultivators or a rotary hoe.

Curbit 3EC has utility in many cucurbit crops, but the labeled crops may vary between states. Curbit 3EC controls **annual grasses** and certain **broadleaf weeds**, including **pigweed** and **carpetweed**. Applications *must* be preemergence. Incorporation of Curbit below the depth of the seed can result in severe crop injury. In addition, cold or wet soil conditions or the use of plastic mulch increase the risk of crop injury. Curbit 3EC use should be avoided early in the planting season, and Curbit 3EC should never be used under plastic mulch. Curbit 3EC is NOT labeled for use in New Jersey, but Curbit is labeled for use in New Jersey in the jug-mix of Command and Curbit called Strategy.

Strategy is a jug-mix of Command 3ME and Curbit 3EC. One gallon of Strategy contains 0.5 pounds of Command and 1.6 pounds of Curbit per gallon. The labeled and recommended rate depends on soil texture. Use 1.5 to 3 pints per acre for coarse textured soils, 3 to 4 pints per acre for medium textured soils, and 4 to 6 pints per acre for fine textured soils. See the chart below to the amount of Command and Curbit in Strategy at 2 to 6 pints per acre.

SEE CUCURBIT WEEDS ON PAGE 5

Command and Strategy Rates (active ingredient) in Strategy

Strategy Rate (pints/acre)	Command (lb ai/acre)	Curbit (lb ai/acre)
1.5	0.094	0.3
2	0.125	0.4
3	0.188	0.6
4	0.25	0.8
5	0.312	1.0
6	0.375	1.2

Strategy **IS LABELED** for use preemergence in **New Jersey** to control weeds in all cucurbit crops. Use care not to exceed the rate of either herbicide on the cucurbit crop being planted. Generally, lower rates are used on cucumbers, muskmelons, and summer squash than on winter squash and pumpkins. **Use lower rates early in the season when cold wet conditions that increase crop injury may occur. Do NOT use Strategy under plastic mulch, or severe crop injury may occur.** See additional comments under Curbit.

Sandea 75WDG has received a label for use in cucumbers to control weeds. Apply Sandea preemergence or postemergence to suppress or control many **broadleaf weeds** and **yellow nutsedge**.

Apply 0.66 to 1.0 ounces of product per acre (0.031 to 0.047 lb ai/a) **preemergence in cucumbers or muskmelons**, after seeding, but before weeds emerge. Irrigate to activate the herbicide if rainfall is not imminent after application. Weed control failures may occur if activating moisture is not provided. Sandea will not control **grasses**, and may not control or only suppress common **lambsquarter** and certain other **broadleaf weeds**. Tank-mix with another herbicide to control **annual grasses** and **broadleaf weeds** not controlled by Sandea. **Use of Sandea preemergence for weed control in winter squash and pumpkins is NOT RECOMMENDED in New Jersey.**

Apply 0.5 to 0.66 ounces of product per acre (0.024 to 0.031 lb ai/a) **postemergence in cucumbers, muskmelons, winter squash, or pumpkins** to control certain **broadleaf weeds**, including **smooth pigweed** and **galinsoga**, and to control **yellow nutsedge**. Add nonionic surfactant to be 0.25% of the spray solution. The number of broadleaf weeds controlled by Sandea applied postemergence is less than the number controlled by preemergence applications, but yellow nutsedge control is more consistent when treated postemergence. Apply Sandea at 0.66 ounces of product per acre when cucumbers have 1 to 3 true leaves and the weeds are less than 2 inches in height when the target is a population of susceptible broadleaf weeds. Delay the application until cucumbers have 3 to 5 true leaves when yellow nutsedge

is the target to allow the perennial sedge more time to develop a leaf canopy to intercept the spray. Use the lower rate, 0.5 ounces of product per acre, and apply Sandea twice when both broadleaf weeds and yellow nutsedge are target weeds. Be patient, control of yellow nutsedge with Sandea requires about 3 weeks!

Sandea is labeled for use in **summer squash and watermelons ONLY** as a directed spray between strips of plastic mulch. See the label.

Extensive testing at Rutgers and other universities has established that the margin of crop safety for Sandea is good when it is used to control weeds in cucumbers. Some temporary crop injury has been observed when postemergence treatments are applied to rapidly growing cucumbers and “soft” growing conditions prevail. The injury appears about 5 to 7 days after treatment, and is seen as a light green or yellow color in the new growth. The color of the shoot tips recovers quickly and appears normal within a week with no affect on yield. Applications after the crop has more than 5 true leaves and has begun to run are more likely to result in the temporary injury that appears as a yellowing of the shoot tip.

Sandea is active as a postemergence herbicide and as a residual herbicide. **Read and follow the crop rotation restrictions portion of the label. An indemnification agreement must be signed with the Vegetable Growers Association of New Jersey to obtain a legal label for the use of Sandea in cucumbers. Membership in the VGANJ and a small fee are required to obtain the label.**

The Sandea label printed on the container lists sweet corn as a labeled crop, however, applications to sweet corn will NOT be recommended in New Jersey until more information concerning crop safety is available. The affects of varietal differences, soil differences, and weather conditions on crop safety are not known at this time.

Poast 1.5EC is labeled for use in all cucurbit crops to control grasses postemergence. The herbicide is very effective but should be applied before **annual grasses** have four true leaves to prevent competition with the crop. Although the label calls for the addition of oil concentrate to be 1% of the spray solution, substitute nonionic surfactant at 0.25% of the spray solution or eliminate the additive when the crop is soft due to abundant soil moisture, warm temperatures, and an extended period of cloudy weather. Under these extreme weather conditions, the risk of crop injury is increased, and **small grasses** are easily controlled by Poast. □

IPM Update

Kristian Holmstrom, Program Associate in Vegetable IPM

Sweet Corn

With continuing cool, damp weather, adult **European corn borer (ECB)** activity has been extremely light. The focus of activity is still in the Salem and Cumberland County areas, with only scattered catches elsewhere. As yet, this pest is not a significant threat to our sweet corn plantings due to low activity and slow growth of corn. ECB spatial maps will resume on June 4, and **corn earworm (CEW)** maps will commence when consistent catches are made.

Recent Weather

Reports from around the state indicate that the cool wet spring we have been experiencing has suppressed many of our common early season insect pests. Generally, insects like **aphids**, **thrips**, and **spider mites** have all been almost non-existent in field situations. **Flea beetles** have been active, but only during the brief periods of favorable weather. This is sure to change when the weather improves. Organisms that are less affected by this weather, such as **onion and cabbage maggots** have been active.

Technicians have noted a higher than usual incidence of **botrytis (gray mold)** in some tomato plantings. This is due to the consistently moist conditions. □

Pest Notes

Gerald M. Ghidui, Ph.D., Vegetable Entomology

✓ **Beans:** Temperatures and moisture are still ideal for development and survival of **seed maggots**. If possible, use seed pre-treated or hopperbox-treated with an insecticide for maggot control (such as Agrox-D, diazinon, or Lorsban). Or, use an in-furrow application of Di-syston or Thimet. Seed treatments protect only the seed, while in-furrow treatments will give protection from early-season insects, such as **bean beetles**, **aphids**, and **leafhoppers**, for 4-6 weeks after application.

✓ **Cabbage:** The only pests found in spring cabbage at this time are **flea beetles** and **imported cabbage worms**. Flea beetles are managed using either Ammo, Asana, Capture, Danitol, Mustang, Fury, Sevin, Thionex (old name of Thiodan), or Warrior. A spreader-sticker added to the spray mixture may improve pest control. For the imported cabbage-worms, many materials are listed in the recommendation book, and all are equally effective. Consider a biological material, such as a Bt, or a neem material such as Aza-Direct, for imported cabbageworm control.

✓ **Cucurbits:** The current weather conditions (cool, moist soils) are ideal for **seed maggot** development and survival. Protection against seed maggots can be obtained using any of a variety of seed treatments containing chlorpyrifos, diazinon, or permethrin. Also, Lorsban 50SL is approved as a seed treatment. The use of Admire 2F at planting for foliar insect pests MAY reduce seed corn damage.

✓ **Eggplant:** **Flea beetles** are found in low numbers on untreated eggplant. If no treatments were yet applied (such as Admire, or Platinum), monitor the flea beetle population closely especially during the seedling stage of plant growth. If populations' increase, or damage continues (in the form of small holes in the leaves), treat with Actara, cryolite, Fury, Mustang, Guthion, Provado, Thionex, or Vydate. All of these materials, with the exception of Fury and Mustang, will also control **Colorado potato beetle** adults and larvae.

✓ **White potato:** **Colorado potato beetle** adults and egg masses are beginning to appear in untreated potatoes in Cumberland and Salem Counties. Although the numbers of each are low, we can expect to see an increase in adult and even larval populations as soon as the temperatures increase. This slow buildup of adults and egg masses reflect the cooler temperatures, both soil and air, that are currently in effect throughout most of New Jersey. Significant beetle activity may not be observed until after next week if the rain showers and cool temperatures continue through this week. □

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged much below normal. Extremes were 82 degrees at Canoe Brook, on the 21st and 35 degrees at Charlotteburg on the 20th. Weekly rainfall averaged 1.70 inches north, 1.48 inches central, and 1.14 inches south. The heaviest 24 hour total reported was 1.25 inches at Flemington on the 25th to 26th. Estimated soil moisture, in percent of field capacity, this past week averaged 83 percent north, 85 percent central and 73 percent south. Four inch soil temperatures averaged 55 degrees north, 54 degrees central and 55 degrees south.

Weather Summary for the Week Ending 8 am Monday 5/26/ 3

WEATHER STATIONS	RAINFALL			TEMPERATURE				GDD BASE50		MON %FC
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	
BELVIDERE BRIDGE	1.82	9.11	-1.69	81	41	58.	-4	295	28	100
CANOE BROOK	1.59	10.80	-1.13	82	40	57.	-5	303	61	99
CHARLOTTEBURG	1.40	11.03	-.72	80	35	53.	-7	145	-14	94
FLEMINGTON	2.15	10.85	-.46	80	36	56.	-7	285	28	100
LONG VALLEY	1.46	9.75	-2.42	74	38	53.	-7	151	-40	100
NEWTON	1.75	8.33	-2.13	80	39	55.	-6	239	44	100
FREEHOLD	1.85	10.19	-1.09	80	42	57.	-7	330	16	100
LONG BRANCH	1.92	10.77	-.87	71	43	54.	-9	239	-33	100
NEW BRUNSWICK	1.58	9.54	-1.54	79	40	57.	-7	293	-50	100
TOMS RIVER	1.21	8.73	-2.53	80	37	55.	-8	293	-2	96
TRENTON	.86	8.47	-1.73	78	37	56.	-9	298	-82	93
CAPE MAY COURT HOUSE	.85	9.24	-.65	71	39	55.	-9	256	-81	81
DOWNTOWN	1.17	8.97	-1.18	78	37	56.	-9	348	-45	90
GLASSBORO	1.99	10.41	-.38	78	46	58.	-7	394	17	100
HAMMONTON	.81	8.09	-2.41	80	38	56.	-9	358	-11	70
POMONA	.68	8.29	-1.52	75	37	55.	-9	284	-29	83
SEABROOK	2.13	10.57	1.28	76	43	59.	-6	422	24	100
ATLANTIC CITY MARINA	.38	7.04	-2.23	69	50	56.	-7	256	-42	62
SOUTH HARRISON	.96	9.97	-.05	76	40	57	NA	402	NA	NA
WES KLINE — GDD BASE 40 PINEY HOLLOW										
Last Week 98 (Ending 5/19/03)										
This Week 112 (Ending 5/26/03)										

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