



**CUCURBIT FUNGICIDES (Labeled & Rates/A) as of JULY 2014**

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Underlined are Registered in NYS for Agricultural Use; Group Nos. appear before the Trade Name and are from the Fungicide Resistance Action Committee and EPA, and last no. = Days to harvest ex. [<sup>FRAC no. 40</sup> Product <sup>4DTH</sup>] (ALL) means for all cucurbits unless noted otherwise; (*Fungicide Resistance\* concerns are given in RED italics*) (*Important comments also in red*); *Strobilurins are no longer effective for \*PM\*, because of widespread resistance, and should not be relied upon for \*DM\* or \*GSB\**. Systemic fungicides are in **BOLD**. OMRI listed products are indicated and are also registered in NYS.

Major fungicide groups have been color coded to aid in finding and are categorized by MOA (mode of action): *Phosphorous acids* = Blue; *Strobilurins* or Group 11 (translaminar) = violet; *chlorothalonils* = black; *coppers* = green; and *sulfurs* = orange. Fungicide usage for soil application or foliar or greenhouse use.

**Alphabetical Fungicide List for Cucurbits**

- <sup>40</sup> Acrobat 50WP<sup>0</sup> (*dimethomorph*) See Forum.
- <sup>Bio</sup> Actinovate AG<sup>0</sup>, OMRI and SP <sup>0</sup>, OMRI (EPA 73314-1), REI 1 hr or till dry as foliar application (*Streptomyces lydicus* WYEC 108, biological) (Natural Industries) (ALL) AG as Soil drench at planting, seedling or transplanting for *Fusarium*, *Rhizoctonia*, *Pythium*, *Phytophthora*, 3-12 oz/A in sufficient water; Foliar treatment for PM, Downy mildew, *Botrytis*, *Alternaria*, 3-12 oz/20-150 gal/A. 0 DTH. SP as Greenhouse drench 4-6 oz in 100 gal water (smaller quantities use at rate of 1 gal per cubic foot of growing media, saturated soil w/o runoff) or 1 tsp. /2 gallons water for smaller treatments; SP as Greenhouse foliar, 6-12 oz in 50-100 gal water and applied to foliage. 0 DTH.
- <sup>Bio</sup> Actino-Iron<sup>0</sup> Biological Fungicide (EPA 73314-2), REI 4 hrs. (*Streptomyces lydicus* WYEC 108, biological) (Natural Industries) (ALL); for *Fusarium*, *Rhizoctonia*, *Pythium*, *Phytophthora* in Greenhouse potting mix at rate of 5 lbs/cubic yard; In-furrow application, 10-15 lbs/A; also used as a side-dress followed by watering in. 0 DTH.
- <sup>33</sup> Agri-Fos<sup>0</sup> (EPA 71962-1) REI 4 hrs (*phosphorous acid*) (Liquid Fertilizer) (ALL) *Phytophthora* root and fruit rot, 1-3 qts/100gal; DM, 1 1/4-2 qts combined with mancozeb/A. 0 DTH.
- <sup>33</sup> Aliette 80% WDG<sup>12hrs</sup> (EPA 264-516) REI 12 hrs. (*fosetyl-AI*) (limit 7 applications) (Bayer) (ALL) DM, *Phytoph* Root and Fruit Rot 2-5 lb. (*Do not mix with copper*); **12 hrs DTH**.
- <sup>M</sup> Armicarb<sup>0</sup> (EPA 5905-541-AA) REI 4 hrs (*potassium bicarbonate*) (Church & Dwight, Helena); (C, M, WM, SS, P, Acorn squash), primarily for PM (several species), but also for An, Alt, DM 2.5-5 lbs/A. 0 DTH. (Also for greenhouse use).
- <sup>M</sup> Armicarb O<sup>0</sup>, Ecomate (EPA 5905-541) REI 4 hrs (*potassium bicarbonate, 85%*) (Helena) (ALL see above). 0 DTH. (may be used in GH).
- <sup>M1</sup> Badge SC<sup>0</sup> (EPA 80289-3) REI 48 hrs (*copper oxychloride + copper hydroxide, 20% metallic equiv. w/w*) (Isagro) (ALL) 1-2.5 pts. /A for Alt LS, Angular LS, anthracnose, DM, GSB, PM. **0 DTH**. (Greenhouse and shadehouse use for crops on label; ie. for cucumber Ang LS and DM, 1-2.5 TBS/1000 sq ft.)
- <sup>M1</sup> Badge X<sub>2</sub><sup>0</sup>, OMRI DF (EPA 80289-12) REI 48hrs. (*copper oxychloride + copper hydroxide, 28% metallic equiv. w/w*) (Isagro) (ALL) multiple diseases, 0.5-1.25 lbs/A, limit to 5.25lb/A. **0 DTH** (Greenhouse and shadehouse use for crops on label; ie. for cucumber Ang LS and DM, 0.5-0.8 TBS/1000 sq ft.)
- <sup>M1</sup> Basic Copper 53<sup>0</sup>, OMRI (EPA 45002-8), REI 24 hrs (*basic copper sulfate, 53% metallic equiv.*) (Albaugh) (ALL) Ang LS, Alt LS, Anth, DM, PM, GSB, Scab 2 lb/A. **0 DTH**.



- <sup>M1</sup> Basic Copper Sulfate<sup>0</sup> (EPA 46923-9) REI 24 hrs (*basic copper sulfate*, 53% metallic equiv.) (Old Bridge) (ALL) Ang LS, Anth, Alternaria LS, Bac. wilt (does nothing), DM, PM, GSB, **Scab**, 2 lbs/A. **0 DTH**.
- <sup>Bio</sup> Bio-Tam<sup>0</sup> (EPA 80289-9-69592) (AgraQuest/Isagro) (ALL) BIO-TAM is a biofungicide containing naturally occurring and selected strains of antagonistic fungi, *Trichoderma asperellum* strain ICC 012 and *Trichoderma gamsii* strain ICC 080. For **soil application** in assorted ways. See label for details. 0 DTH.
- <sup>M5</sup> Bravo Weather Stik 6SC<sup>0</sup> (EPA 50534-188-100) REI 12 hrs (*chlorothalonil*) (limit 21 pts.) (Syngenta) (ALL) **Plectosporium 2ee** for Ultrex, AN, DM; 1 ½-2 pts; GSB, Alternaria L. B., **Scab**, PM 2-3 pts. 0 DTH. (Not for greenhouse-grown crops).
- <sup>M5</sup> Bravo Ultrex 82.5 WDG<sup>0</sup> (EPA 50534-201-100) REI 12 hrs (*chlorothalonil*) (limit 19.1 lbs.) (Syngenta); (ALL) **Plectosporium 2ee** AN, DM 1.4-1.8 lbs/A; GSB, Alternaria L. B., **Scab**, PM 1.8-2.7 lb. 0 DTH (Not for greenhouse-grown crops). See also Bravo ZN
- <sup>11</sup> Cabrio EG<sup>0</sup> (EPA 7969-187 REI `12 hrs (*pyraclostrobin*) (limit 64 oz) (BASF) (*No aerial application in NYS*) (ALL) \*DM\* 8-12 oz; Alternaria L. B., AN, \*GSB\*, **Plectosporium**, \*PM\* 12-16 oz; \*Because of resistance to \*PM\* in NY, do not use QoI fungicides specifically for \*PM\* control; \*Do not use for \*GSB\* control if resistance to QoI exists; For \*DM\* resistance concerns choose an alternative product listed for DM control; Do not make more than 1 application before alternate to a labeled fungicide with diff. MOA and limit to 4 applications per season. 0 DTH. (Not for greenhouse use or in transplant production).
- <sup>M1</sup> Camelot 0<sup>0</sup>, **OMRI** (EPA 67702-2-67690) REI 4 hrs. (10% octanoic acid, copper salt) (W. Neudorff) 0 DTH.
- <sup>M5 + 33</sup> Catamaran<sup>0</sup> (EPA 42519-31) REI 12h (chlorothalonil, 16.7% + potassium phosphite, 38.9%) (limit 50 pts.) (Luxembourg-Pamol) ALL, Anth, DM, Target spot in south, 4 pts/A; Cercospora leaf spot (south), Gummy Stem blight, Alternaria LS, **Scab**, 6 pts/A. 0 DTH.
- <sup>Bio</sup> Cease<sup>0</sup>, **OMRI** (EPA 69592-19-68539), REI 4h, (*B. subtilis*, biological) (Bayer/BioWorks); (ALL), ALS, Anth, DM, GSB, PM, 3-6 qts/A. 0 DTH.
- <sup>M1</sup> Champ Formula 2F<sup>0</sup> (EPA 55146-64) Champ WG **OMRI**, REI 24 hrs. (*copper hydroxide* 37.5%, or 24.4 % metallic equiv.) (Nufarm) (ALL) Alt LS, Ang LS, Anth, DM, PM, GSB, 1 1/3 pt. 0 DTH (for **greenhouse crops as listed**, ex. Cucumber Ang LS and DM, 1.25-1.5 tbs/1,000 sq ft).
- <sup>M5</sup> Chlorothalonil 720 SC<sup>0</sup> (EPA 66330-362) REI 12 hrs (54% *chlorothalonil*) (limit 21 pts.) (Arysta) (ALL), Anth, DM, 1 ½ -2 pts/A; GSB, Alt LB, Alt. LS, **Scab**, PM 2-3 pts/A. 0 DTH. (Note on spraying mature watermelons).
- <sup>M1</sup> C-O-C-S WDG<sup>0</sup> (EPA 34704-326) REI 48 hrs. (74.8% *copper oxychloride* + 14.2% *basic copper sulfate*, 50% metallic equiv.) (Loveland). (ALL), DM, Leaf spots, Anthracnose, 2-4 lbs/A. 0 DTH. (limit of 10.2 lbs/A)
- <sup>Bio</sup> Contans WG<sup>0</sup>, **OMRI** (EPA 72444-1), REI 4 hrs (*Coniothyrium minitans*, biological) (Sylvan Bioproducts/Prophyta); (ALL) WM in **agricultural and greenhouse soils**, 1-4 lbs/A or 0.75-1.5 oz per 1000 sq ft. 0 DTH.
- <sup>M1</sup> Cueva<sup>0</sup>, **OMRI** Fungicide Concentrate (EPA 67702-2-70051) REI 4 hrs. (10% *copper octanoate*) (Neudorff/Certis) (ALL) multiple diseases on generic label, 0.5-2 gal/100 gal . 0 DTH. (limit of 1750 gal diluted spray per year)



- <sup>M1</sup> Cuprofix Ultra 40 Dispers<sup>0</sup> (EPA 70506-201) REI 48 hrs (40% equiv. basic *copper sulfate* 71.1%) (UPI) (ALL) Alt l. s., Ang. L. s. AN, DM, GSB, **PM**, 1.25-2 lbs/A. (may also be used on **plants grown in a greenhouse or shadehouse**) (limit of 13 lbs/A/yr). 0 DTH.
- <sup>27</sup> Curzate 60DF <sup>Must Tank-Mix 3or5</sup> (EPA 352-592) REI 12 hrs (*cymoxanil*) (limit 30 oz) (**locally systemic**) (DuPont) + **protectant**; **DM** (3.2 oz) + mancozeb or chlorothalonil = (**ALL crops**); **3 or 5 DTH as determined by mixing protectant chosen.**
- <sup>17</sup> Decree 50WDG<sup>0</sup> (EPA 66330-35) REI 12 hrs (*fenhexamid*) (Arysta/SePro); For Cucumber only on transplants and greenhouse production. **Botrytis Gray mold**; stand-alone (1.5 lbs/A) or tank mixed with product approved for **gray mold** (1-1.5lb/A); (For **greenhouse crops** or **transplant production**; *Do not apply in the field; do not make more than 2 consecutive sprays*). 0 DTH.
- <sup>M3</sup> Dithane M-45<sup>5</sup> (EPA 62719-387) The most complete vegetable label w/o the need for supplemental labels; REI 24 hrs (80% *mancozeb*) (limit 24 lbs.) (Dow) (ALL) for Altern LS, Anth, DM, GSB, **Plectosporium**, **Scab** at 2-3 lbs. **5 DTH.**
- <sup>M3</sup> \* Dithane F-45 Rainshield<sup>5</sup> (EPA 62719-396) REI 24 hrs (75% *mancozeb*) (limit 19.2 qtrs.) (Dow); (ALL) Anth, Alternaria L. B., **DM**, **GSB**, **Scab** 2-3 lb. 5 DTH. Also Dithane DF Rainshield (EPA 62719-402)
- <sup>Bio</sup> Double Nickel 55 WDG 0, **OMRI** (EPA 70051-108) REI 4 hrs (*Bacillus amyloliquefaciens* strain D 747) (Certis) (ALL) **Foliar Application**: for Powdery mildew (*Erysiphe* and *Sphaerotheca* spp.) Downy mildew (*Pseudoperonospora* spp.) Gummy stem blight (*Didymella bryoniae* and *Phoma cucurbitacearum*), apply as a spray at a rate of **0.25 to 3 pounds per acre** in sufficient water to achieve thorough coverage; **Soil application**: for Vine decline (*Monosporascus cannonballus*) Charcoal rot (*Macrophomina phaseoli*) “Damping off,” seedling blights, and root or crown diseases caused by *Pythium*, *Rhizoctonia*, *Fusarium*, *Phytophthora*, or *Verticillium* spp. (suppression only), apply Double Nickel 55 at **0.125 to 1 pound per acre** (see label for full explanation). 0 DTH. Double Nickel LC<sup>0</sup>, **OMRI** (EPA 70051-107) is also registered on (ALL).
- <sup>M5</sup> Echo 720<sup>0</sup> (EPA 60063-7) REI 12 hrs (54% *chlorothalonil*) (limit 15.75 lbs. ai) (Sipcam); (ALL) Ant, DM, 1 ½ - 2 pts; GSB, Alt l. b., **Scab**, **PM**, 2-3 pts. 0 DTH (OLF Echo 90DF) (*Do not use on greenhouse-grown crops*)
- <sup>7</sup> Endura<sup>0</sup> (EPA 7969-197) REI 12h (*boscalid*) (limit 26 oz, 4 applic.) (BASF) (ALL) Alt LB, GSB, **resistance for PM**. 0 DTH.
- <sup>M5</sup> Equus 720 SST<sup>0</sup> (EPA 66222-154) REI 12 hrs (54% *chlorothalonil*) (limit 21 pts.) (MAMA); (ALL) Ant, DM, 1.5-2 pts; GSB, Alt l b, **Scab**, **PM**, 2-3 pt. 0 DTH. (OLF are Equus 500 ZN and Equus DF) (*Do not use on greenhouse-grown food crops; do not apply more than 21 pts per season*).
- <sup>11</sup> Flint 50WG<sup>0</sup> (EPA 264-777) REI 12 hrs (*trifloxystrobin*) (limit 16 oz) (Bayer) (*No aerial application in NYS*); \***PM**\* 1.5-2 oz (ALL); \***DM**\* suppression 4 oz; **Plectosporium 2ee 2 oz**; \**Because of resistance to \*PM\* in NY, do not use QoI fungicides specifically for PM control; For \*DM\* resistance concerns, choose an alternative product listed for DM control.* 0 DTH. (Not for greenhouse use).
- <sup>7</sup> Fontelis<sup>1</sup> (EPA 352-834) REI 12hrs.(*penthiopyrad*) (Limit to 67 fl oz/season) (DuPont) ALL, Altern LS, Gray mold, GSB, **PM** at 12-16 fl oz; Sclerotinia stem rot, 16 fl oz.. **Do not make more than 2 sequential applications of product before rotating to a fungicide with a different MOA. In the case of GSB, Tank Mix Fontelis with 1.5 lbs ai of chlorothalonil.** 1 DTH.



- <sup>40</sup> **Forum 4.18 SC<sup>0</sup>** (EPA 241-427) REI 12 hrs (43.1% *dimethomorph*, (limit to 30 fl oz) **replaces Acrobat 50WP**) (BASF) (ALL as determined by protectant) (*Must be tanked mixed with protectant; do not make more than 2 sequential applications before alternating with another material for specific control of DM or Phytophthora for at least one application; Do not make more than 5 applications per season*). **DM**, 6 fl oz/A; Phytophthora blight and crown rot, 6 oz/A. **0 DTH. (Not for greenhouse crops or transplant production).**
- <sup>\*33</sup> **Fosphite<sup>0</sup>** (EPA 68573-2) REI 4 hrs (53% mono- and dipotassium salts of *phosphorous acid*) (JH Biotech) (ALL) Phytophthora, DM, 1-3 qts/min. 20 gal/A, *Do not use at intervals of less than 3 days; Do not apply Fosphite foliarly to plants treated with copper at less than 20 day interval.* **0 DTH**
- <sup>33</sup> **Fungi-Phite<sup>0</sup>** (EPA 83472-1) REI 4 hrs (45.5% mono- and di-potassium slats of *phosphorous acid*) (Plant Protectant) (ALL) Phytophthora and Pythium, DM, 1-2 qts in a minimum of 30 gal water. **0 DTH.**
- <sup>\*22+M3</sup> **Gavel 75DF<sup>5</sup>** (EPA 10163-6414) REI 48 hrs (*zoxamide* 8.3% and *mancozeb* 66.7%) (limit 16 lbs.) (Gowan) (ALL) Alternaria, **DM**, **Phytophthora Fruit and Stem rot 2ee**; 1.5-2 lb. 5 DTH. (**Use preventatively for DM control**); (*Not for greenhouse crops or transplant production*).
- <sup>1 + Prot</sup> **Incognito 85 WDG<sup>1</sup>** (EPA 66222-145) REI 24 hrs. (thiophanate-methyl) (limit 2.5 lbs.) (MANA) (C, M, P, WS, SS) Anth, GSB, **Res. PM**, Belly rots) **1 DTH.**
- <sup>M5</sup> **Initiate 720<sup>0</sup>** (EPA 34704-881) REI 12 hrs, (*chlorothalonil*, 54%) (limit 21 pts.) (Loveland) (ALL); Anth, DM, Target Spot, 1 1/2 – 2 pts; GSB, Alternaria leaf blight, **Scab**, Powdery mildew, 2-3 pts/A. **0 DTH.** Also <sup>M5</sup> **Initiate ZN<sup>0</sup>**.
- <sup>3+9</sup> **Inspire Super<sup>7</sup>** (EPA 100-1317) REI 12hrs (8.4% *difenoconazole* + 24.1% *cyprodinil*) (limit 80 fl oz) (**Vanguard**) (Syngenta) (ALL) (**ground application only**); Multiple diseases including **PM**, Alt. leaf blight, and leaf spot, Anthracnose, Gummy stem blight, Septoria leaf blight, **Plectosporium blight**, 16-20 fl oz/A (**No more than 2 sequential applications before alternating to another fungicide with a different MOA.** **7 DTH.**
- <sup>NC</sup> **JMS Stylet-Oil<sup>0</sup>**. **OMRI** (EPA 65564-1) REI 4 hr, (*paraffinic oil*, Not classified) (JMS Flower Farms) (ALL) Alternaria blight, **PM**, GDB, mites, whiteflies, 3-6 qts/A. **0 DTH** (*may be used in GH; see label for compatibility information*)
- <sup>M</sup> **Kaligreen<sup>1</sup>**. **OMRI** (EPA 11581-2), REI 4 hrs (*potassium bicarbonate* 82%) (Toagosei); **PM** for ALL cucurbits 2 1/2 -5 lbs/A. **1 DTH. (May be used in GH).**
- <sup>M1</sup> **Kentan DF<sup>0</sup>** (EPA 80289-2) REI 48 hr, (*copper hydroxide* 61.3% = 40% metallic cu) (Isagro); (ALL), Ang LS, Alt LS, Anth, DM, GSP, **PM**, 1-2.62 lbs (*limit of 5.25 lbs*). **0 DTH.** *May be used for **greenhouse crops** on label.*
- <sup>33</sup> **\*Kphite7LP<sup>0</sup>** (EPA 68573-2) REI 4 hrs. (53% Mono & di-potassium salts of *phosphorous acid*) (Plant Food Systems); (ALL) Generic label for Phytophthora and Pythium and DM, 1-3 qts in 20 gal water. **0 DTH.**
- <sup>M1</sup> **Kocide 3000<sup>0</sup>** (EPA 352-662), REI 48 hrs. (*copper hydroxide* 46.1% = 30% metallic equiv.) (DuPont); (ALL) Alt LS, Ang LS, Anth, DM, GSB, **PM**, 0.5-1.25 lb. **0 DTH.** (**Limit to 17.5 lbs**); *May be used **for greenhouse crops** ie. cucumber and others on label; 1 level TBS per 1000 sq. ft. is equivalent to 0.5 lbs per A*). See also **Kocide 101** and **Kocide 2000**.





- <sup>M2</sup> **Kumulus DF<sup>0</sup>, OMRI** (EPA 51036-352), REI 24 hrs. (80% sulfur) (Arysta). (C, M, S) Rates vary by cucurbit. 0 DTH.
- <sup>7+3</sup> Luna Experience<sup>7</sup> (EPA 264-1091) REI 12hrs. (*fluopyram + tebuconazole*) (Limit to 34 fl oz/season) (Bayer); currently only on watermelon, 6-17 fl oz PM, 8-17 fl oz Altern LS, suppression of GSB, Belly rot and Anthracnose at 17 fl oz. **Do not make more than 2 sequential applications of this and other Gr. 7 or 3 containing fungicides before rotating to a fungicide with a different MOA. 7 DTH.**
- <sup>7</sup> Luna Privilege<sup>0</sup> used as spray (EPA 264-1078) REI 12hrs. (*fluopyram*) (Limit to 13.7 fl oz/season) (Bayer); currently only registered on watermelon, 2.4-6.84 fl oz PM; 6.84 fl oz for GSB, Gray mold, Altern.LS. **Do not make more than 2 sequential applications of this or other Gr. 7 containing fungicides before rotating to a fungicide with a different MOA. 0 DTH.**
- <sup>7+11</sup> Luna Sensation<sup>0</sup> used as spray (EPA 264-1090) REI 12hrs. (*fluopyram + trifloxystrobin*) (Limit to 27.1 fl oz/season or 4 applications/season) (Bayer); currently only for watermelon, PM, 4-7.6 fl oz; Botrytis Gray mold, Alternaria LS, Anthracnose, 7.6 fl oz. **Do not make more than 2 sequential applications of this or other Gr. 7 or 11 containing fungicides before rotating to a fungicide with a different MOA. 0 DTH.**
- <sup>M</sup> **M-Pede<sup>0</sup>, OMRI** Insecticide & Miticide (EPA 10163-324) REI 12 hrs (49% potassium salts of fatty acids) (Gowan); (ALL) Insects and PM, **Greenhouse and field**; (*avoid close contact with sulfur*). 0 DTH.
- <sup>M3+M1</sup> **ManKocide<sup>5</sup>** (EPA 352-690) REI 48 hrs (*mancozeb + copper hydroxide, metallic copper equiv. 30%*) (limit 24 lbs.) (DuPont) (C, M, WM, Sm Squ), Ang LS, DM, GSB, Anth, PM, varies 2-3 lbs/A. 5 DTH.
- <sup>M3</sup> **Manzate Pro-Stick<sup>5</sup>** (EPA 70506-234) REI 24 hrs (75% DG, *mancozeb*) (limit 24 lbs.) (UPI); (ALL), Anth, Alt LS, DM, GSB, **Scab**, 2-3 lbs/A. 5 DTH. (**Not for Gr. Hs. Use**).
- <sup>M1</sup> **Mastercop<sup>0</sup>** (EPA 55272-18-66222) REI 48 hrs. (*copper sulfate pentahydrate, 21.5%*) (limit 7 pts.) (MANA) (ALL) Alt LS, Ang. LS, Anth. DM, GSB, PM. 0 DTH.
- <sup>Bio</sup> **MeloCon WG** (EPA 72444-2) REI 4 hrs. (*Paecilomyces lilacinus* strain 251) (Prophyta) For control of **plant-parasitic nematodes in the soil**, as soil application before planting or transplanting, to transplants, or to soil after planting. 0 DTH.
- <sup>M2</sup> **Microfine Sulfur<sup>0</sup>** Not labeled for cucurbits due to injury.
- <sup>M2</sup> **Microthiol Disperss<sup>0</sup>, OMRI** (EPA 70506-187) REI 24 hrs. (80% sulfur) (UPI); (C, M, P, Sm Wn Squash), **PM 5-10 lbs**; for use in alternating weeks following other effective sprays for PM control; *do not use if temperature will exceed 90 F within 3 days following the spray*. 0 DTH.
- <sup>M2</sup> **Micro Sulf<sup>0</sup>, OMRI** (EPA 55146-75) REI 24 hrs. (*sulfur*) (Nufarm) C = 2-4 lbs (limit to 2 lbs if temps exceed 95 F; Sq = 5-10lb, avoid use on sulfur sensitive varieties. 0 DTH.
- <sup>M</sup> **MilStop<sup>0</sup>, OMRI** (EPA 70870-1-68539) REI 1 hrs (*potassium bicarbonate*), (BioWorks); (ALL), 2.5-5 lbs/100 gal. 0 DTH. (**May be used in Gr. Hs.**)
- <sup>Bio</sup> **Mycostop<sup>0</sup>, OMRI** (EPA 64137-5) REI 4 hrs (*Streptomyces griseoviridis*, biological) (Verdera Oy) (ALL) **Product may be used in a variety of application methods per label; for a variety of root pathogens.** 0 DTH. **Also** <sup>Bio</sup> **Mycostop Mix<sup>0</sup>**.
- <sup>M1</sup> **Nordox75WG<sup>0</sup>, OMRI** (EPA 48142-4) REI 12 hrs. (cuprous oxide) (limit not given) (Nordox) Alt LS, Ang. LS, Anth, DM, GSB, PM, 1-1 ¼ lbs. /A. 0 DTH.



- <sup>M1</sup> Nu-Cop 50WP<sup>0, OMRI</sup> (EPA 45002-7) REI 24 hrs (*cupric hydroxide*, 77%, 50% metallic equiv.) (limit not given) (Albaugh). (ALL) Ang LS, PM, DM, rates vary 1.5-3 lbs/A. 0 DTH (greenhouse and shadehouse crops, for ex. cucumber Ang LS and DM, on other copper labels). See Also Nu-Cop 3L and Nu-Cop HB<sup>OMRI</sup>.
- <sup>?</sup> Nutrol<sup>0</sup> (EPA 70644-1) REI 4 hrs. (100% *potassium dihydrogen phosphate*, Group ?) (Lidochem) (ALL) for PM control, 10-20 lb. 0 DTH.
- <sup>M</sup> Oxidate<sup>0, OMRI</sup> (EPA 70299-2) REI 1 hr (*hydrogen peroxide*) also <sup>M</sup> Oxidate 2.0<sup>OMRI</sup> (BioSafe Systems); (ALL) Belly rot, root rots, Fus. Wilt, Alt, AN, DM, GSB, PM (see label for specifics). 0 DTH.
- <sup>M3</sup> Penncozeb 75DF<sup>5</sup> (EPA 70506-185) REI 24 hrs (75% *mancozeb*) (limit of 24 lbs.) (UPI); (ALL), AN, Alt. 1. s., DM, GSB, Scab, 1.5-3 lbs/A. 5 DTH. (**Not for Gr. Hs. use**). Also Penncozeb 4FL 37% (EPA 70506-194); Penncozeb 80WP, 80% (EPA 70506-183).
- <sup>33</sup> Phostrol<sup>0</sup> (EPA 55146-83) REI 4 hrs. (Mono- and dibasic Na, K and NH<sub>3</sub> phosphites = *phosphorus acid* 6.69 lbs ai/gal = 4.32 lbs./gal) (limit 7 applications/season) (Nufarm); (ALL) Phy Root and Fruit Rot, DM 2.5-5 pts/8-50 gal/A (use 7 days hi risk). 0 DTH.
- <sup>\*43</sup> Presidio<sup>2</sup> (EPA 59639-140). REI 12 hrs (**fluopicolide**) (limit of 12 fl oz) (**Valent**). (mesosystemic) (ALL) Use for the control of selective oomycetes. DM, Phytophthora blight (*P. capsici*) 3-4 fl oz/A. (**must be tank mixed with another fungicide with a different MOA; no more than 2 sequential applications before alternating to another effective fungicide; make no more than 4 applications per season; do not apply to Gr Hs food crops or Gr Hs transplants**). **2 DTH**.
- <sup>Bio</sup> Prestop WP<sup>0, OMRI</sup> (EPA 64137-11) REI 0 hrs. (*Gliocladium catenulatum* Strain J1446, 32%) (Verdera Oy) (ALL) PRESTOP controls seed-borne and soil-borne plant diseases such as damping-off, root and stem rot, and wilt caused by *Alternaria*, *Cladosporium*, *Fusarium*, *Penicillium*, *Phytophthora*, *Plicaria*, *Pythium*, *Rhizoctonia* and *Verticillium*. Incorporate into potting media, or use as soil drench; For foliar application for control of *Didymella* and *Botrytis*. 0 DTH.
- <sup>M</sup> Prev-Am Ultra<sup>0</sup> (EPA 72662-3) REI 12 hrs (sodium tetraborohydrate decahydrate, *borax*) (Citrus Oil); (C, M, P, S) DM, PM, 50 fl oz/100 gal. water (also insects). **0 DTH**.
- <sup>\*28</sup> Previcur Flex<sup>2</sup> (EPA 264-678) REI 12 hrs (*propamocarb*) (limit 6 pts.) (**systemic used with protectant (Bayer); Field (ALL); DM**, 1.2 pts OR 0.6 – 1.2 pts when tank-mixed with chlorothalonil and fixed copper **2 DTH**, with mancozeb **5 DTH**; Pythium root rot and Phytophthora see label; Greenhouse use as soil treatment for *Pythium* and *Phytophthora* spp.
- <sup>11+7</sup> Pristine<sup>0</sup> (EPA 7969-199) REI 12 hrs (*pyraclostrobin + boscalid*) (limit 74 oz) (BASF); (ALL); 12.5-18.5oz/A; Alt, **\*DM\***, **\*PM\***, **\*GSB\***; AN 18.5 oz; *Use as an alternative product when \*PM\*, \*GSB\*, or \*DM\* resistance is an issue; Do not make more than 1 application before alternating to a non-strobilurin fungicide; Use at the highest rate is recommended; No aerial application within 100' of surface water in NYS; Not for use in Greenhouse or transplant production*. 0 DTH
- <sup>\*3</sup> Procure 480 SC<sup>0</sup> REI 12 hrs (*triflumizole*, [imidazole]) (limit 40 fl oz) (**Chemtura**); **PM** (ALL), 4-8 oz; *Use in an alternating program because of \*PM\* resistance; used at the highest rate of 8 oz and mixed with protectant like chlorothalonil; Also for greenhouse cucurbit transplants; Restricted due to toxicity for fish*. **0 DTH**.



- <sup>33</sup> ProPhyt<sup>0</sup> Helena (EPA 42519-22-AA-5905) REI 4 hrs (54.5% potassium phosphite equiv *phosphorus acid* = 34.3%) (Luxembourg-Pamol, Helena); DM for (ALL), 2-4 pts/A tank mixed with dithiocarbamate approved for crop; Phytophthora see label. 0 DTH.
- <sup>11</sup> Quadris F<sup>1</sup> (EPA 100-1098) REI 4 hrs (*azoxystrobin*) (limit of 92.3 fl oz) (Syngenta); (ALL) 11-15.4 fl oz (0.18-0.25 lbs ai) AN, Belly Rot, \*DM\*, \*GSB\*, Alternaria, \*PM\*; *Because of resistance to \*PM\* in NY, do not use QoI fungicides specifically for \*PM\* control; Do not use for \*GSB\* control if resistance to QoI exists; For \*DM\* resistance concerns choose an alternative product listed for DM control* (Do not apply sprays near apples; Do not apply Quadris or other QoI fungicide before alternating with a fungicide with a diff. MOA, and limit to 4 applications per season). 1 DTH. (Not for use for greenhouse-grown food crops).
- <sup>11+M5</sup> Quadris Opti F<sup>1</sup> (EPA 100-1171) REI 12 hrs (4.6 % *azoxystrobin* + 46% *chlorothalonil*) (limit see label) (Syngenta); 3.2 pts (0.1 lbs ai azoxy; 1 lb ai chloro); (ALL) AN, Belly Rot, \*DM\*, \*GSB\*, Alternaria L. B., \*PM\*; *Because of resistance to \*PM\* in NY, do not use QoI fungicides specifically for PM control; Do not use for \*GSB\* control if resistance to QoI exists; For DM resistance concerns, choose an alternative product listed for DM control;* (Do not apply sprays near apples; Do not apply Quadris Opti or other QoI fungicide before alternating with a fungicide with a diff. MOA, and limit to 4 applications per season). 1 DTH.
- <sup>11+3</sup> Quadris Top<sup>1</sup> (EPA 100-1313) REI 12hrs (*azoxystrobin* + *difenoconazole*) (limit 56 fl oz) (Syngenta); (ALL) Alt LB, Alt LS, Anth, Belly Rot, Cercospora LS, DM, GSB, Plectosporium Blt, PM, Septoria LB 12-14 fl oz/A. 1 DTH.
- <sup>13</sup> Quintec 2.08 SC<sup>3</sup> (EPA 62719-375) REI 12 hrs (*quinoxifen*) (limit see label) (Dow); (Muskmelon and other spec. melons and watermelon) (with new section 3 also for Winter squash, gourds and pumpkins); PM, 4-6 fl oz, 10-14 day schedule; *Rotate to a product with a different mode of action than Quintec after application using highest rate; apply the alternate product within at least 14 days of the Quintec.* 3 DTH.
- <sup>3</sup> Rally 40WSP<sup>0</sup> (EPA 62719-375) REI 24 hrs (*myclobutanil* [triazole]) (limit 1.5 lbs.) (Dow) \*PM\* 2.5-5 oz for (ALL); *Use in an alternating program because of \*PM\* resistance; used at the highest rate of 5 oz and mixed with protectant like chlorothalonil.* 0 DTH. (Not for Gr. Hs. use).
- <sup>33</sup> Rampart<sup>0</sup> (EPA 34704-924) REI 4 hrs (Mono- and dipotassium salts of *phosphorous acid*) (Loveland); (ALL), generic label for Phytophthora blight, Pythium and Downy mildew, 1-3 quarts in a minimum of 20 gal water/A; do not apply at intervals less than 3 days. 0 DTH.
- <sup>21</sup> Ranman 400SC<sup>0</sup> (EPA 71512-3) REI 12 hrs (*cyazofamid*) (limit 16.5 fl oz) (ISK/FMC); (ALL) DM, 2.1 to 2.75 fl oz/A; Phytophthora blight, 2.75 fl oz/A (*alternate sprays with a different MOA; mix Ranman with an organosilicone surfactant when water volumes are up to 60 gal/A.*) 0 DTH.
- <sup>11</sup> †Reason 500 SC<sup>14</sup> †NOT labeled in Nassau or Suffolk Co. (EPA 264-695) REI 12 hrs (*fenamidone*) (limit 22 fl oz) (Bayer); (ALL) 5.5 oz; \*DM\* and Alternaria L. B.; *For DM resistance concerns, alternate with chlorothalonil or mancozeb or choose an alternative product listed for DM control; Do not use QoI fungicides specifically for PM control.* 14 DTH.
- <sup>SAR</sup> Regalia EC<sup>0</sup>, OMRI (EPA 84059-3) REI 4h, (*Reynoutria sachalinensis* extract, biological SAR) (Marrone) (ALL); PM, DM, GSB, 2-4 qts/50-100gal. 0 DTH.



- \*<sup>33</sup>Resist 57<sup>0</sup> (EPA 82940-1) REI 4 h. (mono- and dipotassium salts of *phosphorous acid*) (Actagro); (ALL) Foliar Generic label for Phytophthora blight and DM, 1-3 quarts in a minimum of 20 gal water/A. 0 DTH.
- <sup>40</sup>Revus<sup>0</sup> (EPA 100-1254) REI 12 hrs. (*mandipropamid*) (limit 32 fl oz) (Syngenta) (ALL) Suppression only for DM and Phytophthora blight, 8 fl oz (*silicone-based adjuvant recommended (i.e. Silwet L-77)*); *For DM, make no more than 1 consecutive application of Revus tank-mixed with another DM fungicide with a different MOA before switching to an effective fungicide other than Group 40; For Phytophthora, apply Revus in a mixture with copper and alternate with another effective fungicide. Not for use on transplants.* 0 DTH.
- <sup>4</sup>Ridomil Gold SL<sup>0</sup> (EPA 100-1202) REI 48 hrs (*mefenoxam*) (Syngenta); (ALL); Damping off, cottony leak; pre-plant, soil surface spray 1-2 pts; **Not in transplant water for dipping; not for GH use.** 0 DTH; Pythium root rot, directed soil spray, 0.25-0.4 pt. 5 DTH.
- <sup>4+M5</sup>Ridomil Gold Bravo SC<sup>0</sup> (EPA 100-1221) REI 48 hrs (*mefenoxam + chlorothalonil*) (limits see label) (Syngenta) (ALL) DM, 2 lbs; An, GSB, Alt L. B., Scab, 2-3 lbs; *avoid late season applications when plants begin senescence.* 0 DTH.
- <sup>Bio</sup>RootShield Granules<sup>0, OMRI</sup> (EPA 68539-3) 0 REI if soil incorporated (*Trichoderma harzianum* Rifai strain T-22, 1.15%) (BioWorks); in-furrow 2.5-6.0 lbs/1/2 A
- <sup>Bio</sup>RootShield WP<sup>0, OMRI</sup> (EPA 68539-7), 0 hrs or until dry REI (1.15% *Trichoderma harzianum* Rifai strain KRL-AG2) (BioWorks); Gr Hs soil drench, Tsp. starter solution, Chemigation (Gr Hs or Field), rates vary; provides protection against plant root pathogens such as *Pythium*, *Rhizoctonia*, *Fusarium*, *Cylindrocladium* and *Thielaviopsis*. 0 DTH.
- <sup>Bio</sup>RootShield Plus Granules<sup>0, OMRI</sup> (EPA 68539-10), 0 REI if soil incorporated (*Trichoderma harzianum* Rifai strain T-22, 1.15% + *Trichoderma virens* strain G-41, 0.61%) (BioWorks), in-furrow 2.5-6.0 lbs/1/2 A. 0 DTH.
- <sup>Bio</sup>RootShield Plus WP<sup>0, OMRI</sup> (EPA 68539-9), 4 hrs REI *Trichoderma harzianum* Rifai strain T-22, 1.15% + *Trichoderma virens* strain G-41, 0.61% (BioWorks); Gr Hs soil drench, Tsp. starter solution, Chemigation (Gr Hs or Field), rates vary, see label. 0 DTH.
- <sup>M3</sup>Roper DF<sup>3</sup> Rainshield (EPA 34704-1063) REI 24 hrs. (58.1%, *mancozeb*) (Loveland) (ALL) Alt LS, Anth, DM, GSB, Scab at 2-3 lb (limit 25.6 lb). 5 DTH.
- <sup>Bio</sup>Serenade ASO<sup>0, OMRI</sup> (EPA 264-1152) REI 4 hrs (*Bacillus subtilis*) (Bayer); (ALL) Field PM; 4-8 qts/A (*best if used with copper*). 0 DTH.
- <sup>Bio</sup>Serenade MAX WP<sup>0, OMRI</sup> (EPA 264-1151) REI 4 hrs (*Bacillus subtilis*) (Bayer); (ALL) Field and Greenhouse (uses are the same) PM, GSB, DM, 1-3 lb/A/100gal. 0 DTH.
- <sup>M</sup>Sil-Matrix<sup>0, OMRI</sup> (EPA 82100-1) REI 4 hrs. (29% potassium silicate) (PQ Corp) (ALL) for use as a Fungicide/Miticide/Insecticide. 0 DTH.
- <sup>Bio</sup>Sonata<sup>0, OMRI</sup> (EPA 264-1153) (*Bacillus pumilus*) REI 4 hrs (Bayer); (ALL) Field and Greenhouse (uses are the same) Foliar application for PM, DM, 2-4 qts/A/100gal. 0 DTH.
- <sup>11</sup>Sovran<sup>0</sup> (EPA 7969-154) (*kresoxim-methyl*) (BASF); (ALL), \*PM\*, 3.2-4.8 oz/A; \*GSB\*, 4.8 oz/A. (*Not for use on Long Island*) *Do not use QoI fungicides specifically for PM or GSB control; do not make more than 1 application before to a non-strobilurin fungicide with a different mode of action.* 0 DTH.
- <sup>M2</sup>Sulfur 6L<sup>0</sup> (EPA 66330-211), REI 24 (*sulfur*) (Arysta) (melons, cucumbers, squash), PM 4 gal/A. 0 DTH.
- <sup>NC</sup>Surround<sup>0, OMRI</sup> (EPA 61842-18) REI 4hrs. (Tessenderlo) Kaolin clay (ALL) 0 DTH.





- †<sup>9+12</sup>**Switch 62.5WG<sup>1</sup>** (EPA 100-953) REI 12h, (cyprodinil, 37.5% + fludioxonil, 25%) (limit 56 oz) (Syngenta); (ALL), Altern leaf blight, Altern leaf spot, Gummy Stem Blight, Powdery mildew, 11-14oz/A. **1 DTH. *Not for use on Long Island, only there for Onions and Strawberries.***
- <sup>11+27</sup>**Tanos<sup>3</sup>** (EPA 352-604) REI 12 hrs (*famoxadone 25% + cymoxanil 25%*) (limit 72 oz) (DuPont) (ALL); for Alternaria L. B., AN, *DM\**; use 8 oz; (*must be tank mixed with either mancozeb 5 DTH or fixed copper or chlorothalonil or OLF; Do not use Tanos for \*PM\* or \*GSB\*;* *for DM resistance concerns, alternate with chlorothalonil or mancozeb or choose an alternative product listed for DM control ie. Gavel; 2ee for suppression of Phytophthora blight* in the foliar and fruit phase only, use 8 oz/A, and tank mixed with a copper or mancozeb fungicide. **Do not make more than one application before rotating with a fungicide that has a different mode of action; do not make more than 4 applications of Tanos or other Group 11 fungicide per cropping cycle. (3 DTH).**
- <sup>M2</sup>**That Flowable Sulfur<sup>0</sup>** (EPA 57538-5) REI 24 hrs. (*Sulfur*) (Stoller); (ALL); PM, 2-4 pts/A. (*Do not use if air temperatures exceed 90F*). 0 DTH.
- <sup>1+prot</sup>**Thiophanate-methyl 85 WDG<sup>0</sup>** (EPA 66222-145) REI 12 hrs (*thiophanate-methyl + protectant recommended*) (limit 2.5 lbs.) (MANA) (C, M, SS, WS, P) AN, *\*GSB\**, *\*Res. PM\**, 0.2-0.4 lbs. /A; Belly rot, 0.4 lb/A. **0 DTH.**
- <sup>1+prot</sup>**Topsin M 70WP<sup>1</sup>** (EPA 73545-11-70506) REI 12 hrs (*thiophanate-methyl + protectant is recommended*) (limit 3 lbs.) (UPI), (ALL); AN, *\*GSB\**, *\*PM\** (*Do not use specifically for these diseases*), Belly rots (Rhizoc. and Fusarium), 0.5 lb. **0 DTH.** Also Topsin M 70WSP.
- <sup>U6</sup>**Torino<sup>0</sup>** (EPA 8033-103-10163) REI 4hrs. (*cyflufenamid*) (Gowan); PM (ALL) 3.4 oz/A. **No more than once every 7 days and limit to 2 applications/year; Treat as a protectant, although translaminar and vapor action do exist. 0 DTH.**
- <sup>M</sup>**Trilogy<sup>0</sup>**, OMRI (EPA 70051-2) REI 4 hrs (70% clarified hydrophobic extract of *neem oil*) (Certis); (ALL), Listed for multiple diseases including PM and DM and insects, 0.5-1% in 25-100 gal/A. 0 DTH.
- <sup>4</sup>**Ultra Flourish<sup>0</sup> soil** (EPA 55146-73) REI 48 hrs (*mefenoxam*) (limits see label) (Nufarm) (ALL) Pythium DO, cottony leak, use 2-4 pts/A **at planting. (Do not dip plants in solution; do not use for gr. hs. crops).** 0 DTH.
- †<sup>Nem</sup>**Vydate L<sup>1</sup>** (†*Not for use on Long Island*) (EPA 352-372) REI 48 hrs (*oxamyl*, insecticide/nematicide) (DuPont) (ALL) **for nematodes** (root knot, lesion, ring, sting and stunt) and insects, see label for preplant and foliar applications. **1 DTH.**
- 45+40 Zampro<sup>0</sup> (EPA 7969-302), REI 12 hrs (ametoctradin + dimethomorph) (BASF); for DM and Phytophthora blight @ 14 fl oz. (limit to 42 fl oz/season). **0 DTH.**

This summary is provided as a helpful guide to most of the products that are available for Cucurbit Disease Control and is not a substitute for Pesticide Labels. Refer to the 2014 Cornell Vegetable Guidelines or the product label before buying any product. Every effort has been made to provide correct, complete, and up-to-date information at the time of this presentation/publication. Trade names used are for convenience only. No endorsement of products intended, nor is criticism of unnamed products implied. These recommendations are not a substitute for pesticide labeling. Always read the product label before applying any pesticide.

**Abbreviations:** ALL = registered for all the major cucurbit species (crops); † = **Restricted use pesticide prevented on LI**; \* = **Restricted to commercial applicator use**; M = Multi-site activity; OLF = Other labeled formulation or OLP = Other labeled products exist; *\*PM\**, *\*GSB\**, *\*DM\** = **Fungicide resistance concern with product for this particular disease pathogen.**

AN = Anthracose, *Colletotrichum obiculare*; Alternaria leaf blight = *Alternaria cucumerina*; *\*DM\** = Downy mildew, *Pseudoperonospora cubensis*; *\*PM\** = Powdery mildew, *Podosphaera fusca* (syn. *Podosphaera xanthii*), *Erysiphe cichoracearum* (not important); *\*GSB\** = Gummy Stem Blight/Blk Rot, *Didymella bryoniae* (*Phoma cucurbitacearum*); Phytophthora blight, *P. capsici*; Plecto = Plectosporium blight, *Plectosporium tabacinum*; Scab, *Cladosporium cucumerinum*; Ang LS = Angular leaf spot, *Pseudomonas syringae* pv. *lachrymans*.



Overview of complete Cucurbit Fungicide Roster

See: <http://vegetableonline.ppath.cornell.edu> for more updates (underlined = labeled in NYS) [FRAC No. 40 Product 4DTH]

T. A. Zitter, Dept. Plant Pathology Ithaca, NY (JULY 2014)

Systemic fungicides are in BOLD, **Protectants** are listed first. Fungicides are for use on all cucurbits unless otherwise noted.

**Protectants/Mixing Partners** (Diseases listed on label or by 2ee)

- <sup>M5</sup> chlorothalonil<sup>0</sup> (limits see labels) [Bravo WS & Ultrex (Plectosporium 2ee), Equus DF, Echo 720] (these are given first since they have the most complete labels for all vegetables); also Bravo Zn, Chloro. 720, Initiate 720 & Zn; Equus 720; Echo 90DF (An, Alt LB, DM, GSB, Scab, PM)
- <sup>M3</sup> mancozeb<sup>5</sup> (limits see labels) Dithane M-45 (includes Plectosporium put called Microdochium), DF, F-45; Manzate Pro-Stick, Penncozeb 4FL, 75DF, 80WP, Roper DF (included Plecto, called Microdochium) (An, Alt LB, DM, GSB, Scab)
- <sup>M1</sup> fixed copper<sup>0</sup> (see limits now set on newer labels) Badge SC, Badge X, <sup>OMRI</sup>, Basic Copper Sulfate & 53 <sup>OMRI</sup>, Camelot O <sup>OMRI</sup> Champ Formula 2, C-O-C-S, Cueva <sup>OMRI</sup>, Cuprofix, Kentan DF, Kocide 101, 2000, 3000, Mastercop, Nordox 75WG, <sup>OMRI</sup>, Nu-Cop 50WP <sup>OMRI</sup>, 3L, HB <sup>OMRI</sup>, (AngLS, An, Alt, DM, PM, GSB, Scab per label, and by 2ee PhyBlt). Also ManKocide (limit 24 lb) (for AngLS, AltLS, DM, PM, GSB, Scab, 2ee PhyBlt)
- <sup>Bio</sup> Bacillus subtilis<sup>0</sup> = Serenade MAX or ASO (PM, GSB, DM), both <sup>OMRI</sup>
- <sup>Bio</sup> Bacillus pumilus<sup>0</sup>, <sup>OMRI</sup> = Sonata (PM, DM)
- <sup>M</sup> K bicarbonate<sup>0</sup>, <sup>OMRI</sup> = Armicarb, MilStop, Kaligreen<sup>1</sup> (PM)
- <sup>M2</sup> sulfur<sup>0</sup> = Kumulus <sup>OMRI</sup>, Micro Sulf <sup>OMRI</sup>, Microthiol Dispers <sup>OMRI</sup>, Sulfur 6L, That F Sulfur (PM)

**Group 11 Strobilurins and others (Strobilurins=Translaminar, are no longer effective for \*PM\*, because of widespread resistance, and should not be relied upon for \*DM\* or \*GSB\*)**

- <sup>11</sup> Quadris<sup>1</sup> (limit 92.3 fl oz) (azoxystrobin) (Plecto)<sup>11+M5</sup> Quadris Opti<sup>1</sup> (limits see label) (azoxystrobin + chlorothalonil), <sup>11+3</sup> Quadris Top<sup>1</sup> (azoxystrobin + difenoconazole) (limit 56 fl oz) (Alt L Blt, Anth, Belly rot, Plecto, \*PM\*, \*DM\*, \*GSB\*)
- <sup>11</sup> Flint<sup>0</sup> (trifloxystrobin) (limit 16 oz) (\*PM\*, \*DM\*, Plectosporium)
- <sup>11</sup> Cabrio<sup>0</sup> (pyraclostrobin) (limit 64 oz) (Alt L Blight, Anth, Plectosporium, \*PM\*, \*DM\*, \*GSB\*)
- <sup>11</sup> Sovran<sup>0</sup> (kresoxim-methyl) (limit 4 appl.) (\*PM\*, \*GSB\*)
- <sup>\*11</sup> Reason<sup>14</sup> (fenamidone) (limit 22 fl oz) (Alt LB, \*DM\*)
- <sup>11+27</sup> Tanos<sup>3</sup> (famoxadone + cymoxanil) (limit 72 oz) (Alt L. Blt., Anth, DM)
- <sup>11+7</sup> Pristine<sup>0</sup> (pyraclostrobin + boscalid) (limit 74 oz) (Alt L. Blt., Anth, \*PM\*, \*DM\*, \*GSB\*)

**PM Preferred Sprays – “USED Preventatively”**

- <sup>13</sup> Quintec<sup>3</sup> (quinoxifen) (see label limits fl oz) (Winter squash, Pumpkin, Gourds, Melons, Wmelon, only) (for PM only)
- <sup>U6</sup> Torino<sup>0</sup> (cyflufenamid) (PM, all cucurbits) (limit 2 appl/yr)
- <sup>3</sup> Rally<sup>0</sup> (myclobutanil) (limit 1.5 lb) (\*PM\* Resistance concern, use highest rate)
- <sup>\*3</sup> Procure<sup>0</sup> (triflumizole) (limit 40 fl oz) (\*PM\* Resistance concern, use highest rate)
- <sup>M2</sup> Sulfurs<sup>0</sup> (limits) (Kumulus <sup>OMRI</sup>, Microthiol Dispers <sup>OMRI</sup>, Micro Sulf <sup>OMRI</sup>, Sulfur 6L, That) (PM)
- <sup>M</sup> Armicarb<sup>0</sup>, MilStop<sup>0</sup>, <sup>OMRI</sup>, Kaligreen<sup>1</sup>, <sup>OMRI</sup> (PM)
- <sup>M</sup> Trilogy<sup>0</sup>, <sup>OMRI</sup> (neem oil), (PM)
- <sup>M</sup> Mineral oils<sup>0</sup> (JMS Stylet Oil <sup>OMRI</sup>) (PM)

**PM Alternative Sprays & Multiple Disease Control**

- <sup>3+9</sup> Inspire Super<sup>7</sup> (difenoconazole + cyprodinil) (limit 80 fl oz) (PM, Alt, GSB, Septoria, Anthrac, Plectosporium)
- <sup>9+12</sup> Switch 62.5WG<sup>1</sup> (cyprodinil + fludioxonil) (limit 56 oz) (Not on LI; only there for Onions and Strawberries) (Alt LB, GSB, PM)
- <sup>7</sup> Endura<sup>0</sup> (boscalid) (limit 26 oz) (Alt LB, GSB, Res PM, suppr. only)
- <sup>7</sup> Fontelis<sup>0</sup> (penhiopyrad) (limit 67 fl oz) (PM, Alt, GSG, Sclerotinia stem rot)
- <sup>7+3</sup> Luna Experience<sup>3</sup> (fluopyram + tebuconazole) (limit 34 fl oz) (PM, Altern LS, GSB, Belly rot, Anthracnose)
- <sup>7</sup> Luna Privilege<sup>0</sup> (fluopyram) (limit 13.7 fl oz) (PM, GSB, Gray mold, Altern LS)
- <sup>7+11</sup> Luna Sensation<sup>0</sup> (fluopyram + trifloxystrobin) (limit 27.1 fl oz) (PM, Gray mold, Altern. LS, Anth)

**2014 Cucurbit Fungicide NYS**

- <sup>1+Prot</sup> Topsin M<sup>1</sup> (OLP) (limits 2 lbs.) (tank-mix with protect. (\*PM\*, \*GSB\*), Anth, Belly rots (Rhiz and Fus)

**DM and Phytophthora Options (# = DM used**

**“preventatively” or &=use “after disease is present”**)

- <sup>\*22+M3</sup> #Gavel<sup>5</sup> (limit 16 lbs.) (zoxamide + mancozeb), (DM, Phytoph)
- <sup>11+27</sup> #&Tanos<sup>3</sup> (famoxadone + cymoxanil) (limit 72 oz) (Alt LB, An, DM, Phytoph blt)
- <sup>\*28</sup> #&Previcur Flex<sup>2</sup> (limit 6 pts) (propamocarb + protectant), (DM, Pythium root rots)
- <sup>21</sup> #&Ranman<sup>0</sup> (limit 16.5 fl oz) (cyazofamid), (DM, Phytoph.)
- <sup>\*43</sup> #&Presidio<sup>2</sup> (limit 12 fl oz) (fluopicolide) (DM, Phytoph. Blt)
- <sup>45+0</sup> Zampro<sup>0</sup> (ametoctradin + dimethomorph) (DM and Phytoph blight)

**Others listed for DM and Phytophthora**

- <sup>27</sup> Curzate 60DF<sup>3</sup> with protectant (DM)
- <sup>M5+33</sup> Catamaran<sup>1</sup> (phosphoric acid + chlorothalonil) (limit 50 pts.) (An, DM, GSB, Altern LS, Scab)
- <sup>40</sup> Revus<sup>0</sup> (mandipropamid) (limit 32 fl oz) (Suppression only for both DM and Phytoph blight)
- <sup>40</sup> Forum<sup>0</sup> (dimethomorph) (limit 30 fl oz), (DM, Phytoph)
- <sup>33</sup> Alette<sup>12hrs</sup> (fosetyl-AI) (limit 7 applic) (DM, Phytoph)
- <sup>\*41</sup> Reason<sup>14</sup> (fenamidone), (limit 22 fl oz) (\*DM\* only)
- <sup>4+M5</sup> Ridomil Gold Bravo<sup>0</sup> (limit see label) (\*DM\* resistance concern)
- <sup>33</sup> Agri-Fos<sup>0</sup>, \*Fosphite: Fungi-Phite, \*Kphite, Prohostol, ProPhyt, Rampart, \*Resist 57 (phosphorous acid) (limits see labels) (DM, Phytophthora)
- <sup>M</sup> Prev-Am<sup>0</sup> (borax) (DM)

**Scab Products on labels**

- <sup>M5</sup> Bravo<sup>0</sup> or OLP (limits see labels)
- <sup>M1</sup> some coppers<sup>0</sup>, <sup>OMRI</sup>, ManKocide (limit 24 lb)
- <sup>M3</sup> mancozeb<sup>5</sup> (limits see labels)
- <sup>4+M5</sup> Ridomil Gold Bravo<sup>0</sup> (limits see label)

**OTHER PRODUCTS (Pythium)**

- <sup>4</sup> Ridomil Gold<sup>0</sup>, Ultra Flourish (mefenoxam) (see limits on label); (Pythium root rot)
- <sup>Bio</sup> Contans<sup>0</sup>, <sup>OMRI</sup> (Coniothyrium) (White mold)

**GREENHOUSE Usage (Specified on label)**

- <sup>Bio</sup> Actinovate SP<sup>0</sup>, <sup>OMRI</sup> (S. lydicus) Gr Hs drench or foliar application (Soilborne fungi and foliar fungi)
- <sup>\*28</sup> Previcur Flex<sup>0</sup> (propamocarb + protectant), (Pythium, Phytoph see label)
- <sup>3</sup> Procure<sup>0</sup> (triflumizole) (all) PM
- <sup>17</sup> Decree<sup>0</sup> (fenhexamid) (Cucumber only) (Gray mold)
- <sup>Bio</sup> Serenade MAX<sup>0</sup>, <sup>OMRI</sup> (PM, GSB, DM)
- <sup>Bio</sup> Sonata<sup>0</sup>, <sup>OMRI</sup> (PM, DM)
- <sup>M</sup> Armicarb<sup>0</sup>, Milstop<sup>0</sup>, <sup>OMRI</sup>, Kaligreen<sup>1</sup>, <sup>OMRI</sup> (PM)
- <sup>M</sup> M-Pede<sup>0</sup>, <sup>OMRI</sup> (K salts of fatty acids), (PM)
- <sup>M1</sup> Badge SC, Badge X<sup>0</sup>, <sup>OMRI</sup>, Champ Formula 2F (assorted dis.), C-O-C-S WDG, Cueva <sup>OMRI</sup>, Cuprofix Ultra, Kentan DF, Kocide (assorted dis.), Nordox 75WB <sup>OMRI</sup>, Nu-Cop 50WP <sup>OMRI</sup>
- RootShield Granules <sup>OMRI</sup> Hydroponic Cucumber (soil fungi),
- <sup>M</sup> JMS Stylet Oil<sup>0</sup>, <sup>OMRI</sup> (PM, insects)

**Current OMRI Listed Products & Reg. In NYS**

- <sup>Bio</sup> Actinovate AG, SP<sup>0</sup> (Streptomyces lydicus) Soilborne: (Pythium, Rhizoctonia, Phytophthora, Fusarium, Verticillium); Foliar: (PM, Botrytis, Alternaria)
- <sup>Bio</sup> Actino-Iron<sup>0</sup> (S. lydicus) Biological soil additive
- <sup>M1</sup> Badge X<sup>0</sup>, Basic Copper 53 (Scab), Camelot O, Cueva Nordox 75WG, Nu Cop 50WP (coppers)
- <sup>M5</sup> Mycostop<sup>0</sup> (S. griseoviridis) (root dis.)
- <sup>SAK</sup> Regalia EC<sup>0</sup> (Reynoutria), (PM)
- <sup>M</sup> M-Pede<sup>0</sup> (soap, PM); Trilogy<sup>0</sup> (neem), (PM, DM)
- <sup>M</sup> MilStop<sup>0</sup>, Kaligreen<sup>1</sup> (K bicarbonate) (PM)
- <sup>M2</sup> Micro Sulf<sup>0</sup>, Kumulus DF, Microthiol Dis (all for PM) (sulfur)
- <sup>M</sup> Oxidate<sup>0</sup> (hydrogen peroxide)
- <sup>Bio</sup> Serenade ASO and MAX, Cease (Bacillus subtilis), Sonata (Bacillus pumilus)
- <sup>M</sup> Organic JMS Stylet Oil<sup>0</sup> (mineral oil, PM, white flies)
- <sup>Bio</sup> RootShield, RootShield Plus (Trichoderma) Plus = 2 strains
- <sup>Bio</sup> Contans<sup>0</sup> (Coniothyrium) (White mold)

KEY: Orange = Sulfurs; Violet = Group 11 strobilurins; Blue = phosphorous acid salts; Black = chlorothalonils; Green = fixed coppers; \* Restricted to registered applicators; \*Not for use on Long Island. Every effort has been made to provide correct, complete, and up-to-date information at the time of this presentation/publication. Trade names used are for convenience only. No endorsement of products intended, nor is criticism of unnamed products implied. These recommendations are not a substitute for pesticide labeling. Always read the product label before applying any pesticide.



## 2014 Cucurbit Fungicide NYS

**ABCs of Fungicides.** Numbers used before or after the Product (registered NYS) refer to fungicides with different MOA, followed by preharvest interval. [FRAC No. ie 40 Product 4PHI] See: <http://vegetablemdonline.ppath.cornell.edu> (JULY 2014) T. A. Zitter, Department of Plant Pathology, Ithaca, NY

Fungicides are labeled for all cucurbits unless noted. **Systemic** fungicides are in **Bold**. Protectants include: *chlorothanonil*; *sulfur*; *mancozeb*; *copper* (2ee), ManKocide.

A.) Powdery Mildew (PM) - occurs every year, so make sure to use of tolerant varieties if available for squash or pumpkins. Beginning when lesions are 1<sup>st</sup> detected inside the canopy on lower leaves (top or bottom). PM sprays should include:

- <sup>13</sup>Quintec<sup>3</sup> (*quinoxifen*) (NOW registered on winter squash, pumpkins, gourds, muskmelon, and watermelon, but not cucumber or summer squash); begin usage early in the PM cycle then alternate with one of the following:
- <sup>U6</sup>Torino<sup>0</sup> (*cyflufenamid*) only for PM, consider tank mix with protectant
- <sup>M2</sup>Sulfur<sup>0</sup> (good protectant, alone or tank-mixed with Quintec)
- <sup>3</sup>Procure<sup>0</sup> (*triflumizole*) at <sup>Hi rate 8 oz</sup> + <sup>M5</sup>Bravo<sup>0</sup> (or OLP) or <sup>3</sup>Rally<sup>0</sup> (*myclobutanil*) at <sup>Hi rate 5 oz</sup> + <sup>M5</sup>Bravo<sup>0</sup> (or OLP) (NOTE: both Procure and Rally are in the same fungicide group, choose only 1 (Procure preferred)
- Or consider <sup>11+7</sup>Pristine<sup>0</sup> (*pyraclostrobin* + *boscalid*)
- Or consider protectants like <sup>NA</sup>JMS Stylet<sup>0</sup> mineral oil or <sup>M1</sup>coppers<sup>0</sup>
- Or consider <sup>3+9</sup>Inspire Super<sup>7</sup> (*difenoconazole* + *cyprodinil*) or <sup>†</sup><sup>9+12</sup>Switch<sup>1</sup> (*cyprodinil* + *fludioxonil*)

Note: **The strobilurin (Group 11) fungicides** are not listed due to fungicide resistance for PM, and include Cabrio, Flint, Quadris, Quadris Opti, Sovran, Tanos, etc.

B.) Gummy Stem Blight (GSB)/also called Black rot - occurs most seasons when moisture is adequate after fruit set (end of July or beginning of Aug), and if rotation of less than 2 years is practiced.

GSB sprays should include:

- <sup>M3</sup>Penncozeb<sup>5</sup> (or OLP)
- <sup>M5</sup>Bravo WS<sup>0</sup> (or OLP)
- <sup>3+9</sup>Inspire Super<sup>7</sup> (GSB)
- <sup>†</sup><sup>9+12</sup>Switch<sup>1</sup>

Note: **The strobilurin (Group 11) fungicides** are not listed due to fungicide resistance for GSB, and include Cabrio, Flint, Quadris, Quadris Opti, Sovran, and

Pristine. Also <sup>1+Prot</sup>Topsin M<sup>1</sup> (or OLP) (*thiophanate-methyl*) is no longer effective. C.) Plectosporium - if disease has been previously found in Zucchini Squash or Pumpkins, and less than 2 year rotation is practiced, and if July-August rains occur (wet soils) then Plectosporium sprays (for above crops only) should include:

- <sup>M5</sup>Bravo Ultrex<sup>0</sup> 2ee; <sup>M3</sup>Dithane M-45<sup>5</sup>
- <sup>3+9</sup>Inspire Super<sup>7</sup> (Plectosporium)
- <sup>11</sup>Quadris<sup>1</sup>, <sup>11+3</sup>Quadris Top<sup>1</sup>, <sup>11</sup>Cabrio<sup>0</sup>, <sup>11</sup>Flint<sup>0</sup> (but don't rely on sprays of these products for PM or GSB control)

D.) Phytophthora (P) and Downy Mildew (DM) – if P has previously occurred on your farm (must utilize disease management practices) **or** if DM is reported on tracking maps:

<http://cdm.ipmpipe.org/scripts/map.php> (which monitors airborne spores of DM from Michigan, Ontario, Pennsylvania or New Jersey), Then the Top 5 DM/P choices used “preventatively”:

- <sup>\*22+M3</sup>Gavel 50WG<sup>5</sup> (*zoxamide* + *mancozeb*) (DM, P)
- <sup>\*43</sup>Presidio<sup>2</sup> (*fluopicolide*) (DM, P) + must use protectant
- <sup>\*28</sup>Previcur Flex<sup>2</sup> (*propamocarb*) (DM) + protect.
- <sup>21</sup>Ranman 400SC<sup>0</sup> (*cyazofamid*) (DM, P) + protect.
- <sup>11+27</sup>Tanos 50WG<sup>3</sup> (DM, P suppression) + protectant

Top 4 DM choices “after disease is already present”:

- <sup>\*43</sup>Presidio<sup>2</sup> (*fluopicolide*) (DM, P) + must use protectant
- <sup>\*28</sup>Previcur Flex<sup>2</sup> (DM) + protect.
- <sup>21</sup>Ranman 400SC<sup>0</sup> (DM, P) + protect.
- <sup>11+27</sup>Tanos 50WG<sup>3</sup> (DM, P suppression) + protectant

E.) If Scab should be an issue:

- <sup>M5</sup>Bravo WS<sup>0</sup> or OLP
- <sup>M1</sup>fixed coppers<sup>0</sup>, (if on a few labels)
- <sup>M3+M1</sup>ManKocide<sup>5</sup>
- <sup>M3</sup>mancozeb<sup>5</sup> (all)
- <sup>4+M5</sup>Ridomil Gold Bravo<sup>0</sup>

Key: MOA= Modes of Action; OLF= other labeled product and/or formulation; <sup>M</sup> = multi-site activity and mixing partner to reduce risk of developing fungicide resistance; NA= not assigned; 2ee = allowed for specific disease not on original label. \* = Restricted to use by registered applicators; † = Not for use on Long Island