



**2014 Summer and Winter Squash Varieties for Virus and PM Tolerance**

Choosing a Virus Resistant and Powdery Mildew Tolerant Summer and Winter Squash Variety

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Virus diseases affecting cucurbits in the Northeast is an annual event. The determining factors are the presence of virus reservoirs and if weather conditions are particularly appropriate for allowing high aphids populations especially in the spring and continuing into summer. Choosing squash varieties with a good virus resistance package should be a first step when choosing which varieties to grow. The main viruses affecting cucurbits grown in the Northeast are Cucumber mosaic virus (CMV), Watermelon mosaic virus (WMV) and Papaya ringspot virus (PRSV-watermelon). Zucchini yellow mosaic virus (ZYMV), first described in 1981, was previously widely distributed, undoubtedly due to its low rate of seedborne transmission, but it is not currently viewed as significant in the NE. All four of these viruses are spread by aphids in a nonpersistent manner, meaning that transmission occurs so quickly that even if insecticides are used, they do not prevent transmission from occurring. Two forms of resistance are widely used for controlling aphid-borne viruses in many cucurbits; Dr. Rosie Provvidenti of the Department of Plant Pathology at Geneva did pioneering work to identify wild sources of resistance to numerous cucurbit viruses (IR), and transgenic coat protein genes (GE) have been utilized for resistance since the mid-1990s. The precocious yellow gene (gene B, for yellow fruit pigmentation) (Precocious gene column below) was developed by Dr. Shifriss at Rutgers University, and is deployed by many seed companies. This gene prevents the greening of the fruit of yellow summer squash despite the foliage expressing symptoms of either CMV or WMV. This feature allows growers to continue harvesting from infected plants; the feature does not apply if plants are infected by either PRSV-W or ZYMV.

Powdery mildew infection of both summer and winter squash occurs annually. The causal agent for powdery mildew in the Northeast is *Podosphaera fusca* (= *Podosphaera xanthii*). Most growers have relied upon fungicide sprays for mildew control, but with the development of fungicide resistance, the fungicide(s) of choice have changed dramatically. Gone are fungicides like Benlate (Grp. 1, benomyl), all Strobilurins like Quadris (Grp. 11, azoxystrobin), and fungicides like the DMI- fungicides Procure and Rally (Grp. 3) are under attack. Intermediate resistance (IR) is available in many summer squash and zucchini varieties, and some winter squash varieties (all listed below), and should be used. Even then, control of PM on these varieties can be improved by choosing the appropriate fungicide.

Variety (type) (F1) or a few Open Pollinated	Developer	PM	Precocious gene for virus color masking	Resistance gene (GE or IR)	Source
<b>Yellow Straightneck Summer Squash (<i>Cucurbita pepo</i>)</b>					
Cheetah	HarMor	IR	--	IR: PRSV, WMV, ZYMV	Har
Conqueror III	Seminis	IR	--	GE: CMV, WMV, ZYMV, IR:PRSV	SWy Sei
Cougar	HarMor	--	CMV, WMV	IR: PRSV, ZYMV	Har
Daisey	Seminis	IR	--	--	Rup
Fortune	Syngenta	--	CMV, WMV	--	Rup Sie
General Patton	Seminis	IR	CMV, WMV	--	Rup Sto
Goldprize	Syngenta	--	--	IR: WMV, ZYMV	Sei



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Liberator III	Seminis	--	--	GE: CMV, WMV, ZYMV	Rup SWy
Lioness	HarMor	--	--	IR: CMV, PRSV, WMV, ZYMV	Har SWy
Multipik	HarMor	--	CMV, WMV	- (1 <sup>st</sup> true leaf yellows)	Har Joh
Patriot II	Seminis	IR	--	GE: WMV, ZYMV	Joh Rup Sie
Precious II	AC	--	CMV, WMV	--	AC
Seneca Supreme	Seminis	--	CMV, WMV	--	Contact Sem
Success (OP)	Cornell	IR	--	--	HiMo
Sunbar	Seminis	--	CMV, WMV	--	Rup
Sunray	Seminis	IR	CMV, WMV	--	Har Joh
Superpik	HarMor	--	CMV, WMV	--	Har
XPT 1832 III	Seminis	--	CMV, WMV	GE: CMV, WMV, ZYMV	Rup Sei
<b>Yellow Crookneck Summer Squash (<i>Cucurbita pepo</i>)</b>					
Delta	HarMor	IR	--	IR: WMV, ZYMV	Har SWy
Destiny III	Seminis	--	--	GE: CMV, WMV, ZYMV	Rup SWy
Gold Star	Syngenta	IR	--	IR: CMV	Sie SWy
Prelude II	Seminis	IR	--	GE: WMV	Rup SWy
Prelude	Seminis	IR	--	--	
Supersett	HarMor	--	CMV, WMV	--	Har
<b>Yellow and Green Specialty Summer Squash (<i>Cucurbita pepo</i>)</b>					
Cue Ball (Gr globe)	HarMor	--	--	IR: WMV, ZYMV	Rup SWy Sie
One Ball (Yel globe)	HarMor	--	--	IR: WMV, ZYMV	Rup SWy
Rapaz		--	--	IR: WMV, ZYMV	Sie
Sunny Delight (Yel Scallop)	Seminis	--	CMV, WMV	--	Sto
Zephyr (green-tip)	Johnny's	--	CMV, WMV	--	Joh
<b>Green Zucchini Squash (<i>Cucurbita pepo</i>)</b>					
Bobcat	HarMor	--	--	IR: WMV, PRSV, ZYMV	Sto
Cashflow	Syngenta	--	--	IR: ZYMV	Sie
Declaration II	Seminis	--	--	GE: WMV, ZYMV	Rup
Dividend	Syngenta	--	--	IR: CMV, WMV, ZYMV	SWy
Dunja	Enza Zaden	IR	--	IR: PRSV, WMV, ZYMV	Joh
Elegance	HarMor	IR	--	IR: WMV, ZYMV	Har
Emerald Desire	Syngenta	IR	--	IR: CMV, WMV, ZYMV	Sie
Endeavor	Sakata	IR	--	IR: PRSV, WMV, ZYMV	Sie
Envy	Syngenta	IR	--	IR: ZYMV	Varies
Esteem	HarMor	IR	--	IR: PRSV, WMV, ZYMV	Varies
Felix	HarMor	IR	--	IR: PRSV, ZYMV	Har
Equinox	Syngenta	IR	--	IR: WMV, ZYMV	Varies
Independence II	Seminis	--	--	GE: WMV; IR: ZYMV	Rup Sie
Jacobo	Syngenta	IR	--	IR: WMV, ZYMV	Varies
Jaguar	HarMor	--	--	IR: WMV, ZYMV	Har
Judgement III	Seminis	--	--	GE: CMV, WMV, ZYMV	Sie
Justice III	Seminis	--	--	GE: WMV; IR: CMV, ZYMV	Sie



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Leopard	HarMor	--	--	IR: PRSV, WMV	Har Sto SWy
Lynx	HarMor	--	--	IR: PRSV	Sto SWy
Noche	Syngenta	--	--	IR: WMV, ZYMV	Joh
Pascola	Syngenta	IR	--	IR: CMV, WMV, ZYMV	Sie
Paycheck	Syngenta	IR	--	IR: CMV, WMV, ZYMV	Sie Sto SWy
Payload	Syngenta	IR	--	IR: CMV, WMV, ZYMV	Sie
Payroll	Syngenta	IR	--	IR: WMV, ZYMV	Sie SWy
Prestige	HarMor	IR	--	--	Har
Preference	HarMor	IR	--	IR: WMV, ZYMV	
Revenue	Syngenta	--	--	IR: CMV, WMV, ZYMV	Joh
Reward	HarMor	IR	--	IR: CMV, WMV, ZYMV	SWy Har
Spineless Perfection	Syngenta	IR	--	IR: WMV, ZYMV	Joh Sie Har
Tigress	HarMor	--	--	IR: PRSV, WMV, ZYMV	Har Joh
Wildcat	HarMor	IR	--	IR: PRSV, ZYMV	SWy
Symphony	AC	--	--	IR: WMV, ZYMV	Sie
<b>Yellow Zucchini (1<sup>st</sup> Golden) or 2<sup>nd</sup> Grey Zucchini Squash (<i>Cucurbita pepo</i>)</b>					
Golden Arrow	HarMor	--	--	IR: WMV, PRSV, ZYMV	Har
Golden Delight	Syngenta	--	--	IR: WMV, ZYMV	Rup Sto Sie
Golden Glory	Syngenta	IR	--	IR: WMV, ZYMV	Joh Sie SWy
Golden Rod	HarMor	--	CMV, WMV	--	Har
Sebring (Golden)	HarMor	IR	--	--	Joh SWy
Citlali (Grey)	HarMor	IR	--	IR: ZYMV	Har
Cuarzo (Grey, Club)	Syngenta	IR	--	IR: WMV, ZYMV	Varies
Depredador (Grey)	Seminis	--	--	IR: PRSV, WMV, ZYMV	Rup
Hurakan (Grey)	HarMor	IR	--	--	Har
Ishtar (Grey)	HarMor	--	--	IR: WMV, ZYMV	Sie SWy
Linda (Grey)	HarMor	IR	--	IR: CMV, PRSV, ZYMV	Har
Terminator (Grey)	Seminis	--	--	IR: PRSV, WMV, ZYMV	Sie
<b>Acorn Winter Squash (<i>Cucurbita pepo</i>)</b>					
<u>Variety</u>	<u>Developer</u>	<u>PM</u>	<u>Rind Color</u>	<u>Comments or Features</u>	<u>Source</u>
Autumn Delight	Seminis	IR	Green	--	Sei SWy
Celebration	Cor & Rup	IR	Gold Striped	--	Rup SWy
Harlequin	Cornell	IR	Caramel w Gr Stripes	--	Rup
Honey Bear	Johnny's	IR	Green	AAS 2009	Joh
Royal Ace PR	HarMor	IR	Green	--	Har,
Sweet REBA (OP)	Cornell	IR	Green	REBA = Resistant Early Bush Acorn	HiMo
Table Star	Rupp	IR	Green	--	Rup
Table Treat	Rupp	IR	Green	--	Rup
Taybelle PM	Seminis	IR	Green	--	Sei SWy
Tiptop PMR	Johnny's	IR	Green	--	Joh
<b>Butternut Winter Squash (<i>Cucurbita moschata</i>)</b>					
Betternut 401	Rupp	IR	Classic Beige	3 lb. fruit	Rup



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Betternut 900	Rupp	IR	Classic Beige	3 lb. fruit	Rup
Bugle (OP)	Cornell	IR	Classic Beige	½ lb smaller than Waltham	Rup
Honeynut (OP)	Cornell	IR	Caramel	4-5 inch mini Butternut	HiMo, Har
Jacqueline	Enza Zaden	IR	Classic Beige	Peanut shaped, FM or processing	Enza Zaden
JWS6823	Johnny's	IR	Classic Beige	Shorter vine than Metro	Joh
Metro PMR	Johnny's	IR	Classic Beige	2 1/2-3 1/2 lb. smaller than Waltham	Joh
<b>Specialty Winter Squash (both <i>Cucurbita pepo</i> and <i>Cucurbita maxima</i>)</b>					
Bonbon buttercup	HarMor	IR	Classic Green	Semi-bush plant habit	Har
Bush Delicata (OP)	Cornell	IR	Creamy Elongate w Gr Stripes	AAS for 2002	Varies
Sweet Lightning (Flattened acorn)	Rupp	IR	Creamy-yel w Orange Stripes	Decorative and best eating quality	Rup
Winter Sweet (Kabocho)	Johnny's	--	Lt. grey w charcoal mot	Black rot (BR) resistance reported	Joh

**Specified Disease Resistance:** Information on varietal disease resistance was acquired from seed company web sites. Intermediate Resistance (IR) is defined as the ability of a plant variety to restrict the growth and development of a specific pathogen. The plants will normally show less severe symptoms of a susceptible plant. Plants express IR or tolerance can often perform better following a fungicide application in the case of fungal diseases.

**Diseases mentioned in above Table:**

Common name	Abbre.	Scientific name - current	Scientific name - previous	Method of spread
Cucumber mosaic virus	CMV	<i>Cucumber mosaic cucumovirus</i> (Family: <i>Bromoviridae</i> )	--	Aphids, nonpersistent manner
Papaya ringspot virus-watermelon	PRSV	<i>Papaya ringspot potyvirus</i> , watermelon strain (Family: <i>Potyviridae</i> )	--	Aphids, nonpersistent manner
Watermelon mosaic virus	WMV	Watermelon mosaic potyvirus (Family: <i>Potyviridae</i> )	--	Aphids, nonpersistent manner
Zucchini yellow mosaic virus	ZYMV	<i>Zucchini yellow mosaic potyvirus</i> (Family: <i>Potyviridae</i> )	--	Aphids, nonpersistent manner
Powdery mildew	PM	<i>Podosphaera fusca</i>	<i>Podosphaera xanthii</i> (Px); <i>Sphaerotheca fuliginea</i>	Conidia are readily dispersed by air; races 1 and 2 recognized
Gummy stem blight/ Black rot	BR	<i>Didymella bryoniae</i> (sexual stage); <i>Phoma cucurbitacearum</i> (asexual stage)	<i>Mycosphaerella melonis</i>	May be seedborne; may survive from season to season in soil

**Developer** (Alphabetical): Abbott and Cobb, Cornell University (CU), Enza Zaden, Harris Moran, Johnny's, Rupp, Sakata, Seminis, Syngenta. **Seed Sources** (Alphabetical): Abbott and Cobb (AC), Harris Moran (Har), High Mowing (HiMo), Johnny's (Joh), Rupp (Rup), Seedway (SWy), Siegers (Sie), Stokes (Sto).