

Evaluation of Commercially Available Varieties of Yellow Squash and Zucchini for Tolerance to Cucurbit Leaf Crumple Virus in Georgia

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Background

Both zucchini and yellow squash (*Cucurbita pepo*) are valued at more than \$50 million and grown on more than 8,000 acres annually in Georgia. Recently the *cucurbit leaf crumple virus* (CuLCrV), vectored by the silverleaf whitefly (*Bemisia tabaci*) has become devastating to producers growing fall squash in Georgia (Figure 1.). The virus losses for this virus over the past two years are estimated at over \$30-40 million in yellow squash and zucchini. Most commonly grown varieties have shown no resistance to this virus. To determine if any resistance or tolerance existed in commercial varieties a trial was conducted in Fall 2017 in Tifton, Georgia.

Methods

Twenty varieties were grown. Plants were grown on single rows, with 12-inch in-row spacing. Plants were harvested 10 times each season. Plants were rated for virus incidence, vigor (0-9) and virus severity (1-5) four times during the growing season. Fruit were counted and graded into fancy and medium size categories. The trial was arranged in a randomized complete block design with three replicates of ten plants each.



Figure 1. Typical symptoms of the CuLCrV in yellow squash.

Results continued...

Generally 'Lioness' had the least severe symptoms for yellow squash, while several varieties of zucchini had similar virus severity ratings. In general the virus symptoms were less severe in zucchini than in yellow squash.

Plant vigor results were similar to virus severity ratings. Most yellow squash (Figure 3a) had low relative vigor. Zucchini plants had greater vigor than yellow squash (Figure 3b). 'Justice III', a variety with relatively low virus severity also had high levels of vigor.

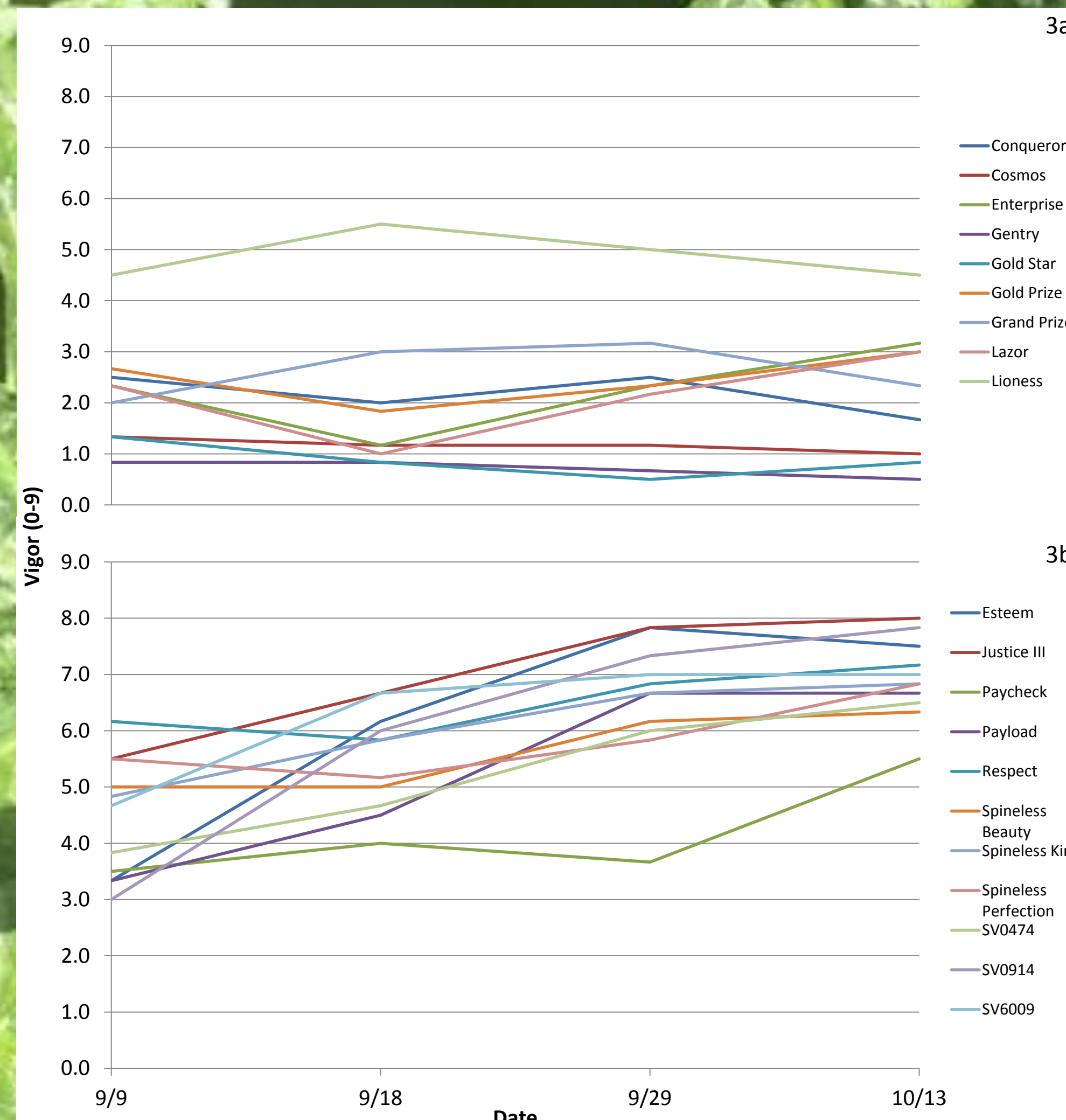


Table 1. Yields for yellow squash and zucchini grown in Tifton, GA in Fall 2017.

Yellow Squash Variety	(boxes/acre) ²			Culls (%)
	Total	Fancy Fruit ^y	Medium Fruit	
Lioness	190 a*	190 a	0	74 b
Grand Prize	150 a	150 a	0	75 b
Gold Prize	40 b	40 b	0	91 a
Conqueror III	30 b	30 b	0	95 a
Enterprise	20 b	20 b	0	94 a
Lazor	20 b	20 b	0	97 a
Gold Star	4 b	4 b	0	96 a
Cosmos	0 b	0 b	0	100 a
Gentry	0 b	0 b	0	100 a

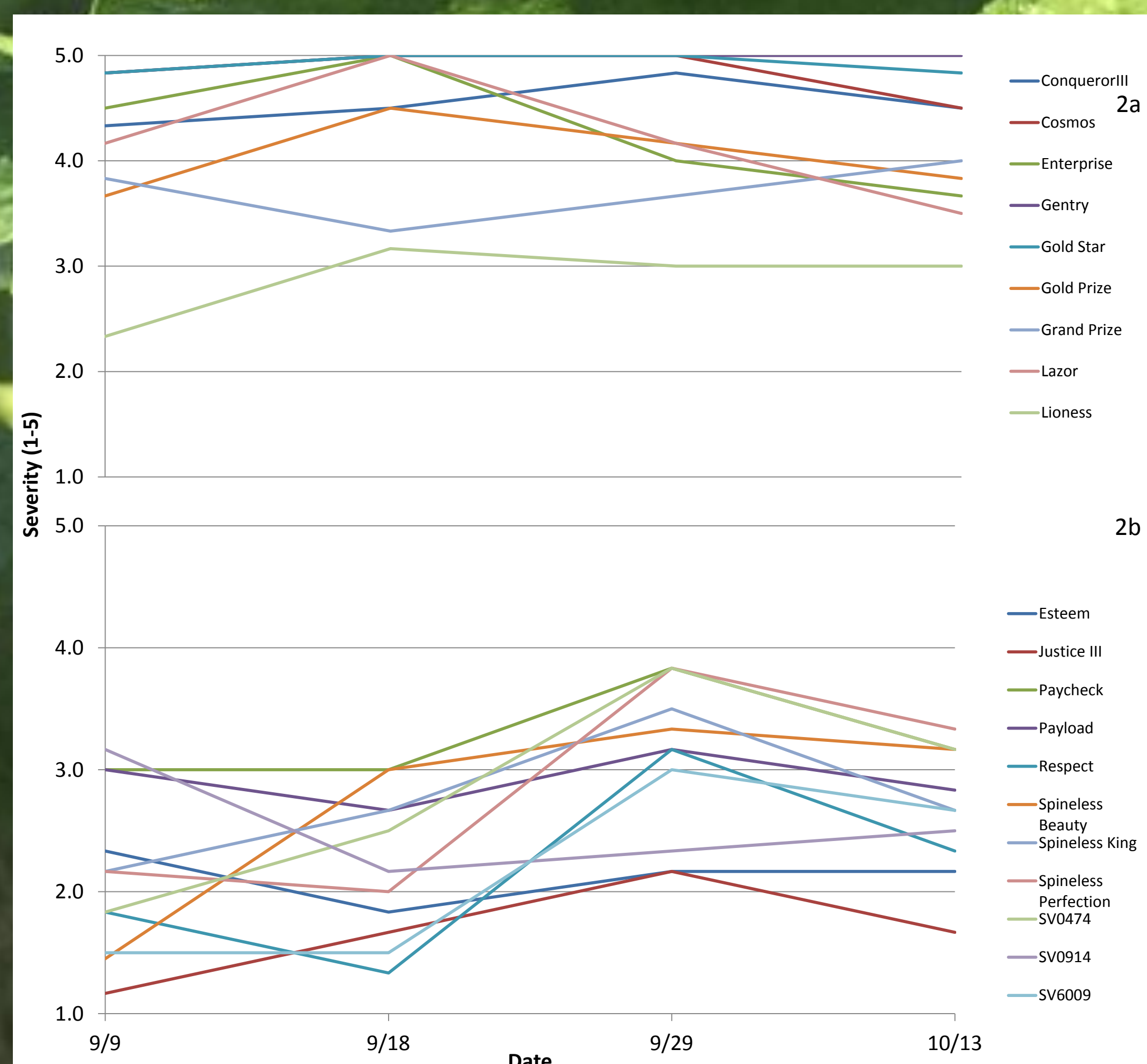
Zucchini Variety	(boxes/acre)			Culls (%)
	Total	Fancy Fruit	Medium Fruit	
SV6009	660 a	630 a	30 a	40 c
SV0914	490 ab	470 ab	20 a	45 c
Esteem	480 ab	460 ab	20 a	40 c
Payload	470 ab	460 ab	10 a	52 bc
Respect	460 ab	460 ab	0 a	46 bc
Justice III	400 b	390 b	10 a	53 bc
SV0474	370 bc	370 bc	0 a	44 c
Paycheck	360 bc	360 bc	0 a	63 ab
Spineless	340 bc	330 bc	10 a	50 bc
Beauty				
Spineless	300 bc	290 bc	10 a	53 bc
Perfection				
Spineless King	170 c	170 c	0 a	72 a

Main Effects	(boxes/acre)			Culls (%)
	Squash Type	Total Fruit	Medium Fruit	
Zucchini		410 a	10 a	50 b
Yellow Squash		50 b	0 b	92 a

²Yields are presented per 1/2 bushel box (21 lb), estimated to contain 36 medium fruit and 60 fancy fruit based on average fruit weight and size.
^ySquash graded based on USDA grades for marketable squash.
^{*}Values followed by the same letters in a given are not significantly different according to Fisher's Protected LSD, (P<0.05).

Results

All plots had 100% infection by the second rating (18 Sept.) (*data not shown*). Yellow squash (Figure 2a) and zucchini (Figure 2b) had some differences in virus severity ratings.



Yields among yellow squash and zucchini differed significantly (Table 1). 'Lioness' had the highest yellow squash yields, although they were approximately 1/10th of what typical yields for yellow squash are in the fall in Georgia. Zucchini yielded better, with the variety SV6009 having the highest numeric yield of 660 boxes/acre, although this was not significantly different from several other varieties. Cull rates were high in all squash plants, although 100% of fruit were culled in some yellow varieties. The CuLCrV can lead to greening in fruit, but the primary reason for culling were misshapen fruit.

Conclusions

- This is the first documented screening of squash for tolerance to CuLCrV.
- Although 'Lioness' was the best performing yellow squash variety, yields were still too low for it to be recommended for planting when high levels of CuLCrV are present.
- 'SV6009', a dark green zucchini had the highest yields for zucchini, which although low do offer some options for growers affected by virus.
- Vigor and virus severity ratings did not necessarily correlate well with yield total for zucchini. 'Justice III' had high vigor and low severity ratings, but yielded lower than several other varieties.
- Zucchini plants tend to show less severe symptoms than yellow squash and consequently yields were significantly greater for zucchini over yellow squash.

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