



Comparison of 'Gulf Coast' Blueberry yields in Southwest Florida with and without bird exclusion netting¹

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General Comments

In regions where flocking birds forage on soft fruits, significant crop loss may occur. Oregon reported 10 to 60% annual blueberry (*Vaccinium corymbosum*) crop losses due to bird depredation. Significant damage to blueberry can occur from European Starlings (*Sturnus vulgaris*), American Robins (*Turdus migratorius*), and Cedar Waxwings (*Bombycilla cedrorum*).

To determine effects of flocking birds in southwest Florida, we looked at landbird migration patterns, particularly the Cedar Waxwing. In 1992, this species was reported to be a major concern to Florida blueberry growers. Many eastern birds travel along the coast southwesterly, usually crossing northwest and central Florida. Early-ripening blueberries such as various Southern Highbush cultivars like the 'Gulf Coast' may be consumed by birds overwintering in Florida, and migrating north. Although Cedar Waxwings and migrating flocks have been seen in southwest Florida, it is not in the

“mainstream” migration route for landbirds. Birds accustomed to feeding on fruit crops are difficult to control, as they move rapidly.

Indirect methods for controlling bird damage include removal of features like nesting, perching, and roosting sites, but this is not ecologically responsible or effective in controlling migration damage. Direct control methods include repellents, hazing, and netting.

Two chemical repellents, methyl anthranilate (MA) and Keyplex-350, were tested on New York blueberries. The researchers concluded that MA did not reduce bird damage significantly, degraded rapidly, and required re-application. Keyplex-350 repelled birds somewhat but made the fruit taste bitter. Another study concluded that MA, and ReJeX-iT AG-36 were ineffective bird repellents.

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Few scare devices work well individually with time. Birds become acclimated to stationary scare objects and noisemakers. Blueberry growers in central Florida were successful with noisemakers and frequent monitoring against Cedar Waxwings.

A survey in 1992 ranked netting the most effective control method. Netting is the most expensive method, time-consuming, and difficult to work around. Depending on the type of net and supports, the cost varies from \$1,000 to \$5,000 per acre. Approximate costs for 3/4 inch plastic netting is \$0.05 per square foot (Redden Net Co., Vancouver, B.C. Canada) and four-strand polyethylene netting costs \$0.27 per square foot (Biocontrol Network, Arizona). Material cost for 1/3 acre in 1992 was \$659.11. An Illinois study found the yield increase on net-protected blueberries paid 80% of the installation costs. Using 10-year rot-resistant netting, investments may become profitable by year two.

Plastic 1/4 inch nets are commonly used for small fields. Netting on large fields may interfere with machine harvesters. Dr. Paul Lyrene, deciduous fruit breeder, University of Florida-IFAS, tested Cedar Waxwing exclusion netting for blueberry plantings in central Florida and found the netting (hole maximum 3/4") to be highly effective at preventing damage. Most Florida growers do not use netting because of the expense and because flocking bird damage is sporadic and site specific. Problems typically occur in central Florida during the spring, with Sebring the southernmost significantly damaged area.

Blueberry Damage Trial

Blueberry yields were compared between an unprotected area (0.15 ac.) and an area protected with bird-exclusion netting (0.21 ac.) at the UF-IFAS Southwest Florida Research and Education Center. Prior to harvest we installed 5/8" by 3/4" polypropylene netting (Conwed Plastics, Inc., Minneapolis, Minnesota) supported from above by 9-ft-high poles connected by wire, and below by metal rods. Weekly surveys were conducted during the harvest season to document the presence and activity of birds. Occasionally birds found their way through the netting, but these events were minimized by net inspection and mending.

Ten bird species were recorded in the blueberry field (Table 1). Northern Mockingbirds (*Minus polyglottos*) were the most abundant and had highest frequency of eating blueberries. Northern Mockingbirds were often observed fighting and chasing other species away, and may have limited the amount of bird activity by solitary foragers such as Rufous-side Towhee, Blue Jay, and Gray Catbird. Mockingbirds would likely be overwhelmed by flocking species, such as Cedar Waxwings, but there were no flocks of Cedar Waxwings or other species observed during the study period. Migratory patterns of Cedar Waxwings do not typically include southwest Florida, and observations of Cedar Waxwings in southwest Florida are uncommon. Ground foraging birds like the Northern Bobwhite presumably had no effect on harvestable crop.

Four plots in both areas contained seven Gulf Coast plants in a row. We harvested blueberries once per week from 3/23/00 to 5/18/00. All ripe berries were removed by hand and the fresh weight measured. We found no significant difference in blueberry yield between protected and unprotected areas (Figure 1). Blueberry production with time was essentially identical.

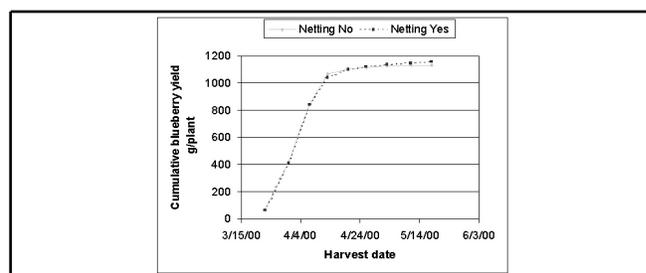


Figure 1. Cumulative 'Gulf Coast' blueberry production for protected and unprotected plants.

These results suggest that local southwest Florida bird populations do not pose a major threat to blueberries yields without exclusion netting. The results probably are based on the behavior of resident birds and migratory patterns of flocking species. Blueberry damage from Cedar Waxwings could occur periodically, but justification of installation and maintenance costs of exclusion netting is questionable based on our results. In north and central Florida, however, where large migratory flocks of Cedar Waxwings more commonly occur, exclusion netting may be necessary to prevent substantial losses of blueberry yields.

Table 1. Summary of bird observations in unprotected 'Gulf Coast' blueberry plots. *Ground pecking bird

Bird	Scientific name	Mean number birds per 5 minute interval	Frequency (%) of time eating blueberries
Northern Mockingbird	<i>Mimus polyglottos</i>	.98	75
Northern Bobwhite*	<i>Colinus virginianus</i>	.44	25
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>	.44	63
Blue Jay	<i>Cyanocitta cristata</i>	.39	14
Gray Catbird	<i>Dumetella carolinensis</i>	.33	67
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	.17	0
Common Ground-Dove*	<i>Columbina passerina</i>	.11	0
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	.11	100
Eastern Meadowlark	<i>Sturnella magna</i>	.06	0
Palm Warbler	<i>Dendroica palmarum</i>	.06	0