Florida Agricultural Experiment Station
Project Enhancement Award Progress Report

Proposal Title: Evaluating Potential Invasiveness of Ten *Nandina domestica* Cultivars in North and South Florida

Investigators: Sandra Wilson (IRREC) and Gary Knox (NFREC), Department of Environmental Horticulture, UF

Brief Narrative of Project: Certain qualities predispose plants to becoming a potential invasive threat in Florida, including (1) tolerance of variable conditions including light, temperature, and moisture, (2) aggressive growth, (3) preference to disturbed sites, (4) ability to produce much seed over a long reproductive period, (5) no special seed germination requirements, (6) documented spread in other parts of world. Data from the IFAS assessment showed a high invasive impact for wild type *Nandina* in north and central Florida and a low invasive impact for south Florida. However, over 40 cultivars of *Nandina* exist. No information is available on the potential invasiveness of *Nandina* across cultivars or across Florida. Data for cultivars is of critical importance for the nursery and landscape industry when making informed decisions about which plants to grow and implementing newly adopted voluntary codes of conduct for invasive plants.

Research Methodology and Progress: The experimental design was a randomized complete block with 11 cultivars and 9 single plant replications. The wild type and ten cultivars were selected for this study based on popularity and availability (Table 1). Clonally propagated cultivars (each in 1 gal pots) were obtained from several nurseries (Table 1). The experiment was conducted at Fort Pierce (USDA Zone 9B) and Quincy (USDA Zone 8B) where 9 uniform plants of each cultivar were planted (28 Jan 2003) 4 ft on center on raised beds covered with plastic mulch. Plants were watered by seep (Fort Pierce) or drip (Quincy) irrigation as needed and fertilized with a slow release fertilizer 4 wks after planting.

At the time of planting (day 0) growth indices were calculated for each plant as an average of the measured height and two widths [(height + width 1 + width 2)/3] (Table 2). Stem caliper was measured 1 inch above the crown (Table 2) and multiple shoots were recorded. A sub-sample of plants were not planted but destructively harvested for initial dry weight measurements (Table 2). Shoots of 3 plants per cultivar were severed at the crown, oven dried at 70 °C for 1 week and weighed.

Visual quality assessments (plant color and form) were taken monthly by three individuals for each cultivar in each block (Figure 1). Assessments of color and form were performed on a scale from 1 to 5 where 1=very poor quality, not acceptable, severe leaf necrosis or yellowing, 2=poor quality, not acceptable, large areas of necrosis or yellowing, poor form, 3=fair quality, marginally acceptable, somewhat desirable form and color, 4=good quality, very acceptable, nice color without yellowing, good form, marketable, and 5=excellent quality, very marketable. Observations of flower initiation, panicle number, and fruit set were also recorded monthly

next fall.

Preliminary germination experiments were performed on seed collected from wild type plants (standard species) that escaped into natural areas of Alfred B. Maclay State Gardens (Tallahassee, FL). Seeds were cleaned, bleached with 10% chlorox for 5 min, and rinsed 3 times with nanopure water. Unstratified and stratified seeds were germinated in petri-dishes placed in growth chambers set at 35/25C, 30/20C, 25/15C, and 20/10C with a 12 hr photoperiod. Stratification was achieved by placing seeds in 1:1 sand:sphagnum peat (moistened and autoclaved) for 8 wks at 4C. Data is still being collected, as germination times are lengthy.

Table 1. Description and nursery source of ten *Nandina* cultivars and the wild type (standard species) utilized for field and germination evaluation studies in North and South Florida.

Nandina domestica	**Description**	**Reported flowering/fruiting characteristics**	**Source**
Compacta	Green foliage in summer turning brilliant red in fall and winter; Moderate grower to 4 - 5 ft. tall, 3 ft. wide	Information not available	San Felasco Nurseries, Gainesville, FL
Filamentosa	Finely dissected leaves give this plant a lacy, fern-like appearance; New foliage is reddish becoming bright green in summer and turning orange, bronze or purplish red in fall; Slow growing; Some sources give a mature height of 1 - 2 ft., others say 3 - 4 ft.; Sometimes called *Nandina filamentosa* 'Threadleaf', N. 'San Gabriel' and N. 'Kirajuse'	Pinkish white flowers reported in late spring and summer	Magnolia Gardens Nursery, Waller, TX (plugs); grown in 1 gallon containers at NFREC, Quincy, FL
Firepower	Dwarf similar to 'Atropurpurea Nana' but without contorted leaves; Neat mounds of foliage growing 2 ft. or more tall and wide; Foliage turns brilliant red in fall and winter	No flowers reported	Monrovia Growers of Georgia, Cairo, GA
Gulf Stream™	Dwarf growing 3 - 3 ½ ft. tall; Variable red-green	Flower inflorescences about 4 in. long	Monrovia Growers of Georgia, Cairo, GA

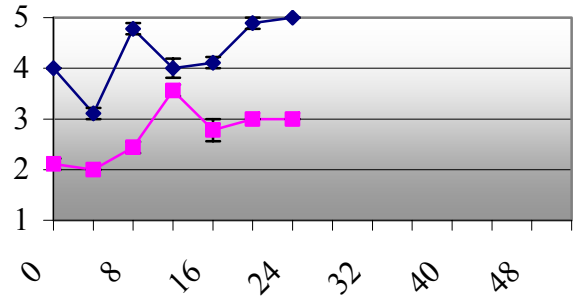
	dense growth; Does not "sucker" like Harbour Dwarf	some say few to no fruit are produced	
Harbour Belle™ ('Jaytee', PPAF)	New, more robust form of Harbor Dwarf; Fine compound leaves with burgundy fall color; Grows 2 - 3 ft. tall	Flowers and berries reported	San Felasco Nurseries, Gainesville, FL
Harbour Dwarf	~~Dwarf with~~ Branches from the ground and forms a dense mound of blue-green summer foliage and red-tinged winter coloration; Grows 2 - 3 ft. tall and spreads rhizomatously	Flowers and fruit noted on older plants	Monrovia Growers of Georgia, Cairo, GA
Moon Bay™ (Plant Patent No. 5659)	Dwarf with a mounded habit, 1 ½ - 2 ½ ft. high; Shiny, light green summer leaves with red hues in winter	No flowers reported	Monrovia Growers of Georgia, Cairo, GA
Plum Passion® ('Monum', Plant Patent No. 12069)	New growth is deep purplish red; Foliage is deep green in summer and reddish-purple in winter; Moderate grower to 4 - 5 ft. tall	Information not available	Monrovia Growers of Georgia, Cairo, GA
Royal Princess	Large, upright shrub; Narrow leaves, turning reddish-purple in winter; Height of 6 - 8 ft.	Small white flowers. Large panicles of bright red berries	Magnolia Gardens Nursery, Waller, TX (plugs); grown in 1 gallon containers at NFREC, Quincy, FL
Umpqua Chief	New foliage emerges copper or purple-red and turns blue-green; Grows 5 - 6 ft. tall	White flowers followed by red berries	Magnolia Gardens Nursery, Waller, TX (plugs); grown in 1 gallon containers at NFREC, Quincy, FL
Wild type (standard species)	Broadleaf evergreen shrub growing 6 – 8 ft. high; Bluish-green leaves turning to reddish purple in winter	Flowers in May are 8 – 15 in. terminal panicles opening to six-petaled, ¼ in. wide blooms, white with yellow anthers; Globular red fruit, 1/3 in., ripen in September and October and persist through the winter	Monrovia Growers of Georgia, Cairo, GA

Growth index is reported as [(height +width + width)/3]. Days to flower are reported as the time after field planting.

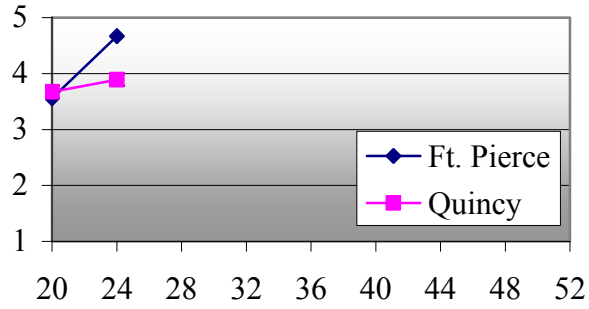
Nandina domestica	Shoot dry weight (g) (day 0)	Growth index (cm) (day 0)	Stem caliper (mm) (day 0)
Compacta	9.34	30.14	8.21
Filamentosa	2.70	23.21	4.22
Firepower	22.19	28.70	7.64
Gulf Stream™	17.87	29.02	8.65
Harbour Belle™	7.85	27.97	5.14
Harbour Dwarf	6.54	27.25	7.98
Moon Bay™	21.97	28.77	8.32
Plum Passion®	40.20	54.35	11.20
Royal Princess	12.98	34.21	6.92
Umpqua Chief	11.50	34.76	6.47
Wild type	10.28	32.51	5.89

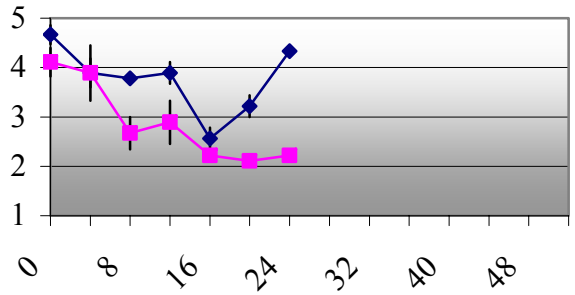
Figure 1. Monthly visual quality assessment (plant color and form) of ten *Nandina* cultivars and the wild type planted in North and South Florida.

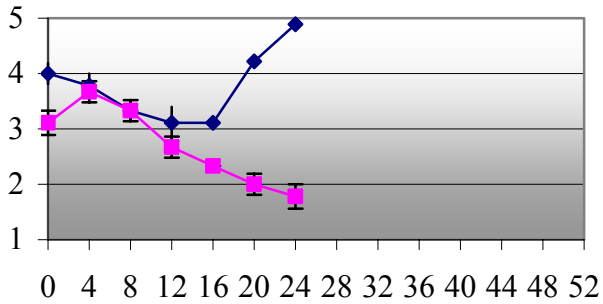
Compacta



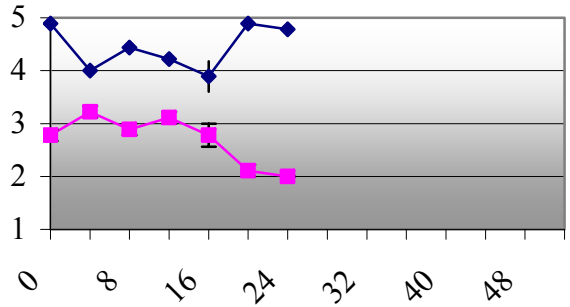
Filamentosa



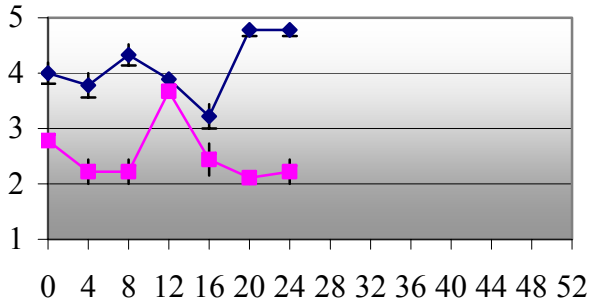




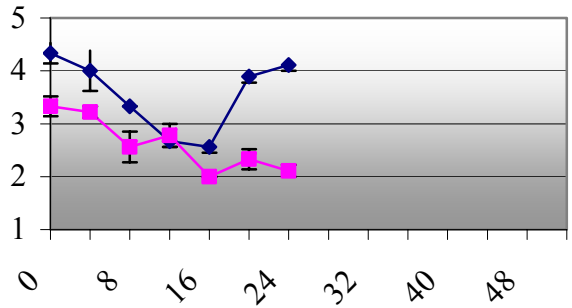
Harbour Belle™



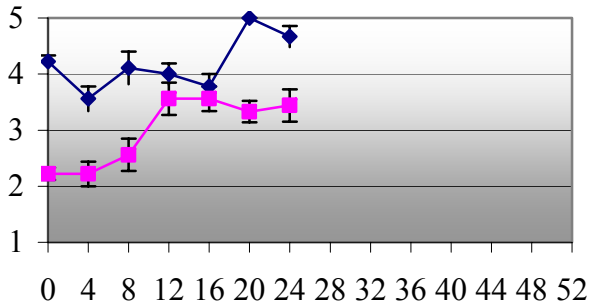
Harbour Dwarf



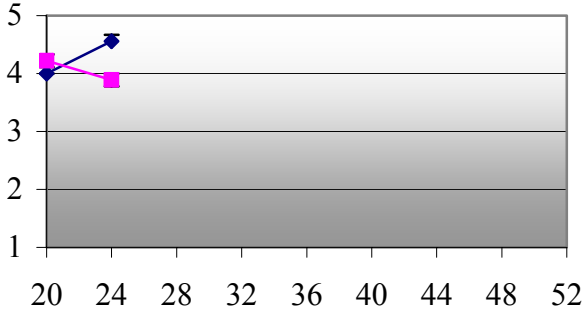
Moon Bay™



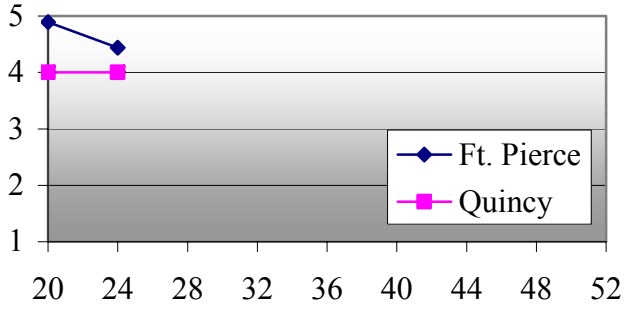
Plum Passion®

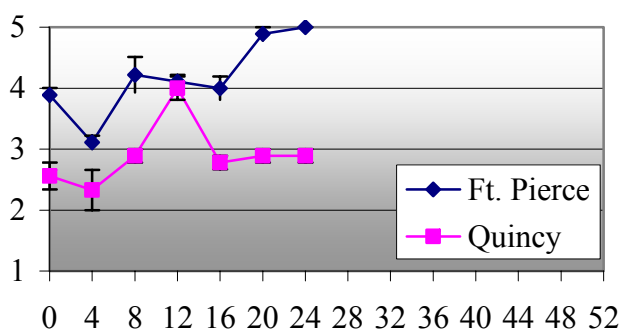


Royal Princess



Umpqua Chief





Color and form rating scale

Rating	Level of performance	Color
1	very poor quality	dark gray
2	poor quality	medium gray
3	fair quality	light gray
4	good quality	pale gray
5	excellent	white