

Nicotiana wigandiodies

New Crop Presentation

By Matthew Ng

Neil Anderson – Plant Production II - 2014

Nicotiana wigandioides

Topics to be Covered...

- History
- Classification and Varieties
- Other Nicotiana Varieties
 - How to Grow
- Purchasing Bedding plants
- Geographical Distribution
 - Native Habitat
 - Taxonomic Description
 - Garden Preferences
 - Product Specification
 - Market Niche
- Anticipated Cultural Requirements
 - Production Schedule
- Needs Assessment for Genetic Improvement

History

- The first of the ornamental *Nicotianas* to gain garden popularity was *Nicotiana alata*. Introduced into garden cultivation in the United States and England in the early 1800's.
- *Nicotiana* fell out of favor with many gardeners because the tall plants often needed to be staked or supported to keep them looking nice in the garden.
- Ornamental types of *Nicotiana* are commonly called flowering tobacco leading to some confusion since nearly all *Nicotianas* flower.



“Flowering Tobacco” - Ornamental



Tobacco, could be smoking tobacco

History

- Its genus name was designated by Linnaeus in 1753, it recognizes Frenchman Jean Nicot, ambassador to Portugal from 1559-1561 who brought powdered tobacco to France to cure the Queen's son of migraine headaches.



Jean Nicot 1530 – May 4th 1600



Classification and Varieties

- Nicotiana belongs to the large and diverse Solanaceae or Nightshade family.
- Includes many important edible and ornamental plants. Its closest flower relative is the petunia and it is also related to tomatoes, peppers, eggplants and potatoes.
- There are over 60 species of *Nicotianas* but only a few are important in the ornamental flower garden. These garden species are native to tropical South America, primarily Brazil, Argentina and Bolivia.

Other Nicotiana Varieties

- Most species of nicotianas are tall plants reaching up to 5 feet in height, while newer hybrids have been developed to stay around 12 to 18 inches tall making them much more versatile in the garden.
- *Nicotiana alata* (synonym *N. affinis*) is a short-lived perennial most often grown as an annual. The large plants grow up to 5 feet tall and produce tubular white flowers that are profusely fragrant at night. Plants are open and airy and the stems may bend under the weight of the lush flower clusters.
- 'Avalon Bright Pink' nicotiana won both the 2001 All-America Selections® award and the European Fleuroselect Gold Medal for its attractive bright pastel pink flowers that stand out in the garden.

Avalon Bright Pink!



N. alata

Only the Lonely™



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How to Grow

- *Nicotiana* are easy to grow. Plants flower and bloom best in partial shade to full sun. Plants prefer a rich, well draining soils. Mix a healthy dose of compost into the soil prior to planting.
- They like a lot of water and nutrients... Just not “wet feet”.
- Add fertilizer when planting and every month during the season. Use a high phosphorous formula just before the first blooming period.
- These plants have "sticky" leaves. Debris can be captured on the leaves and stick. It can be difficult to remove without damage to the leaves. Be careful when weeding or applying compost and mulch.
- Some *Nicotiana* need to be staked if the stalk grows too tall.

Purchasing Bedding Plants

- Most hybrid *Nicotiana* will be sold with flower buds or in bloom in 4- or 6-plant packs while the larger species types may be available as individual plants in large pots.
- Most *Nicotiana* are sold as seeds in packets.
- Most vegetative *Nicotiana* are sold while flowering.

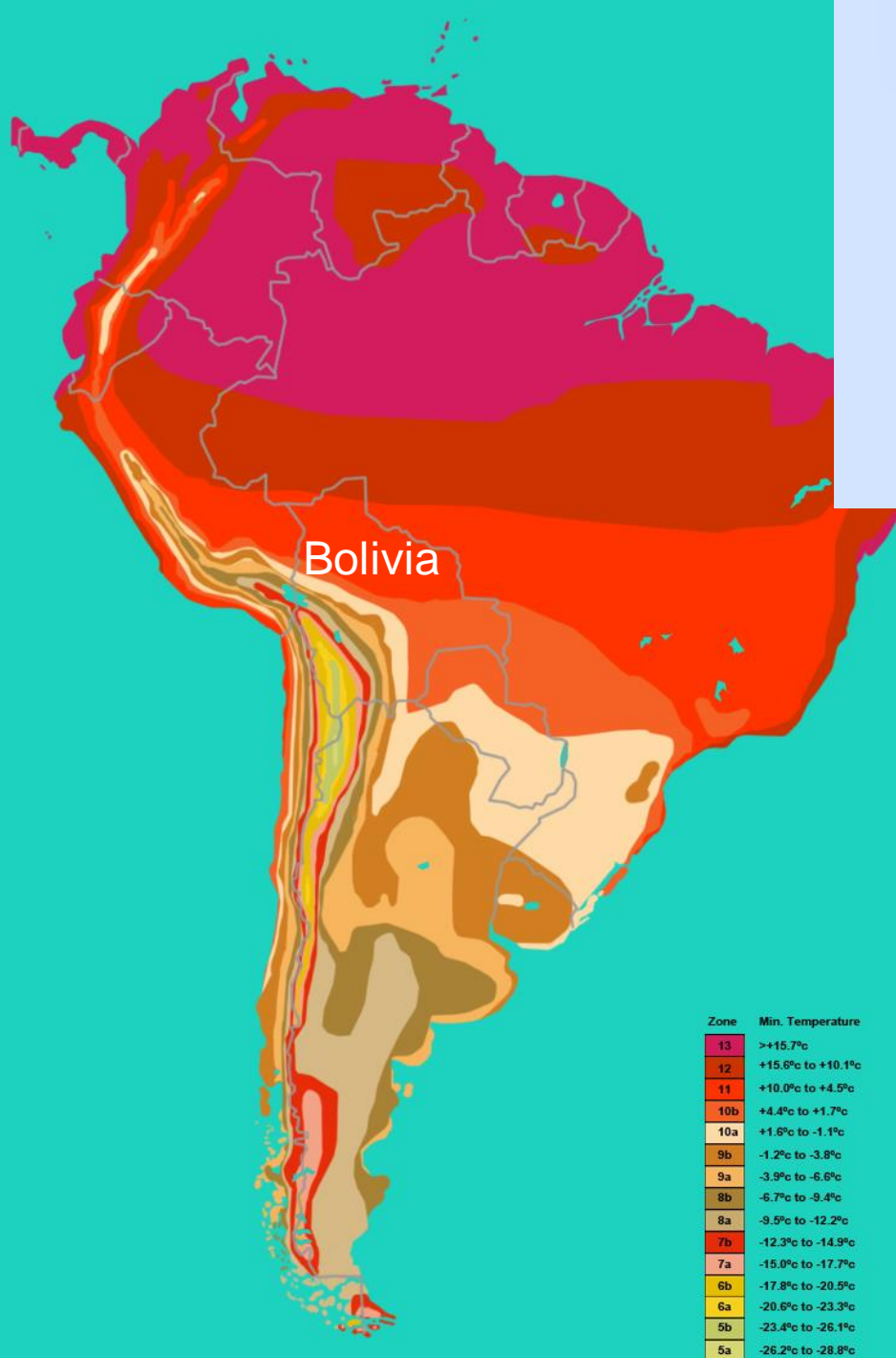


NICOTIANA STARSHIP MIXED



Geographical Distribution

- Not much is known about the geographical distribution of *Nicotiana wigandioides*.
- The seeds of *N. wigandioides* were obtained from the USDA Germplasm Resources Information Network (GRIN) from La Paz Bolivia.
- All species of *Nicotiana* are native to South America with the remainder distributed through Central America, western North America, Australia, and various islands in the South Pacific.
- *Nicotiana wigandioides* remains a fairly new and underused species of *Nicotiana*.



- Seeds came from Bolivia.
 - Mountain rainforest landscape
 - Burbank also had some seeds
- He crossed a petunia with a tobacco plant to make a *wigandioides* species.

Native Habitat

- *Nicotiana wigandioides* is native to La Paz, Bolivia, and the seeds for this plant were obtained from Siberia Chica, Carrasco Province at an elevation of 200 meters. A mountain rainforest climate.
- *N. wigandioides* was first cultivated in the United States, in Sebastopol California, in the mid 1800's and spread around by Luther Burbank on his experimental farm, but the plant did not survive the winter.

Taxonomic Description

Annual or Perennial?:

- *Nicotiana wigandioides* is a perennial eudicot, like all of the *Nicotiana* species. However, most smoking tobacco varieties are grown as annuals, but are perennials.
- A eudicot is like a dicot. Another name for the eudicots is “tricolpates”, a name which refers to the structure of the pollen. The group has tricolpate pollen, or forms derived from it. These pollen have three or more pores set in furrows called colpi. In contrast, most of the other seed plants (that is the gymnosperms, the monocots and the paleodicots) produce monosulcate pollen, with a single pore set in a differently oriented groove called the sulcus.

Height:

- *Nicotiana wigandioides* can be from two to six feet tall.

Taxonomic Description

Root:

- A long fibrous root, brown and around 10-12 inches, or more.

Stem:

- The stem is erect, dark purple-brown, woody and slightly glabrous.

Taxonomic Description

Leaves:

- Appear to grow angled toward the base of the plant, and can be lobed.
- Alternate, occurring as one leaf per node along the stem, often growing to be twenty inches long and ten inches wide!
- The veins of the leaves are pinnately-netted.
- The leaves are viscid, (but not pubescent like other *Nicotiana*).
- The leaves are varied in size and shape sometimes they are ovate, can be obcordate, or can be elliptic. A deep green color, with an entire margin.
- The veins of the leaves are pinnately-netted.

Nicotiana
Smoking Tobacco



wigandioides



Taxonomic Description

Flowers

- The flowers of *Nicotiana wigandoides* are numerous and smaller than other varieties of *Nicotia*.
- The flowers are mostly white with a reddish tinge of anthocyanin on the petals, sepals, and stem. Flowers can also appear to be tinged green in the petals near the receptacle and sepals.
- The flowers are borne on a terminal raceme panicle which can be compact to very lax with a short or long peduncle. The flowers are trumpet shaped, tubular, and hypogenous with conjoined petals that form a bucket-like ring around the sex organs.

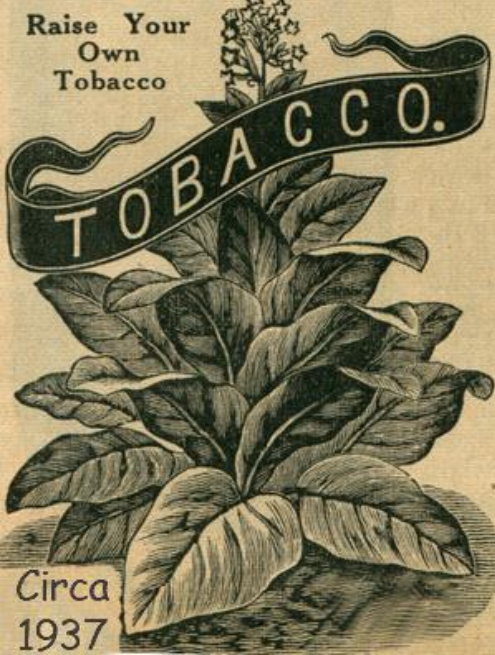
Other Characteristics

- The plant gives off a narcotic odor of a putrid tobacco smell and has a burning taste. *Nicotiana wigandoides* is day neutral like all other species of *Nicotiana* and will begin to bloom in early summer (Procedures for Experimental Use).



Garden Preferences

- Spacing—The mature size of the plant determines the correct spacing. Allow 6-12 inches between the shorter hybrid nicotianas, 18-30 inches for tall species varieties.
- Days to Bloom—Newer hybrid varieties begin blooming about 10 weeks after sowing seed, while the species start blooming about 12-14 weeks after planting.
- Plant Care—Tall plants may need to be staked or supported in windy or open areas. *Nicotiana alata* and *N. sylvestris* can be overwintered in warm winter areas where temperatures rarely fall below freezing. Roots will resprout the following spring however, they may need a mulch of leaves or hay for protection during the winter months.



Garden Preferences

- Aphids and spider mites as well as caterpillars like to settle on the sticky glands of the plants. Strong streams of water can be used to dislodge these insects, but take care not to break the wiry stems or large leaves.
 - Insecticidal soap can be used to treat more severe infestations.
 - Nicotianas are susceptible to, but not often bothered by viruses such as tobacco mosaic virus (TMV).
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Product Specification

- Nicotiana could do well as an ornamental plant because of its pink tinged flowers in either a container or in a garden provided the climate is warm for long enough during germination and maturation.



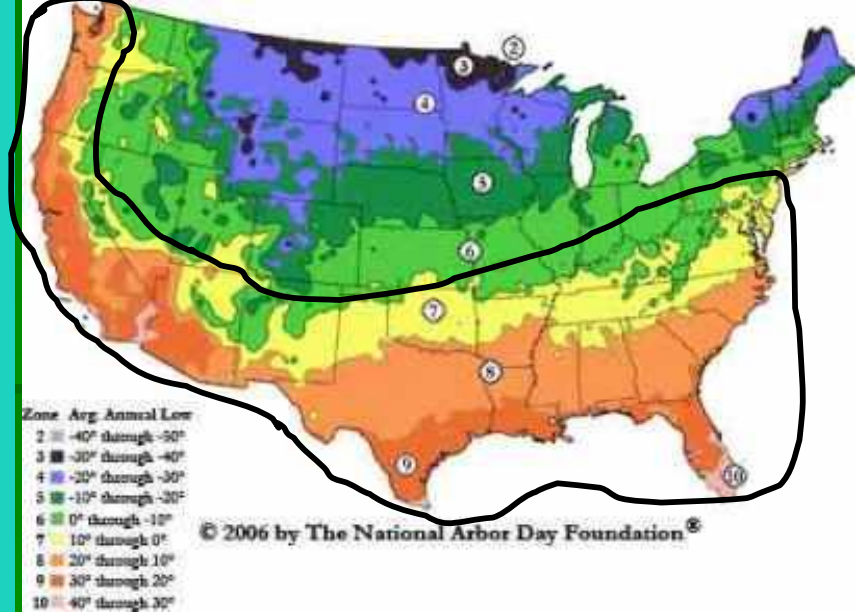
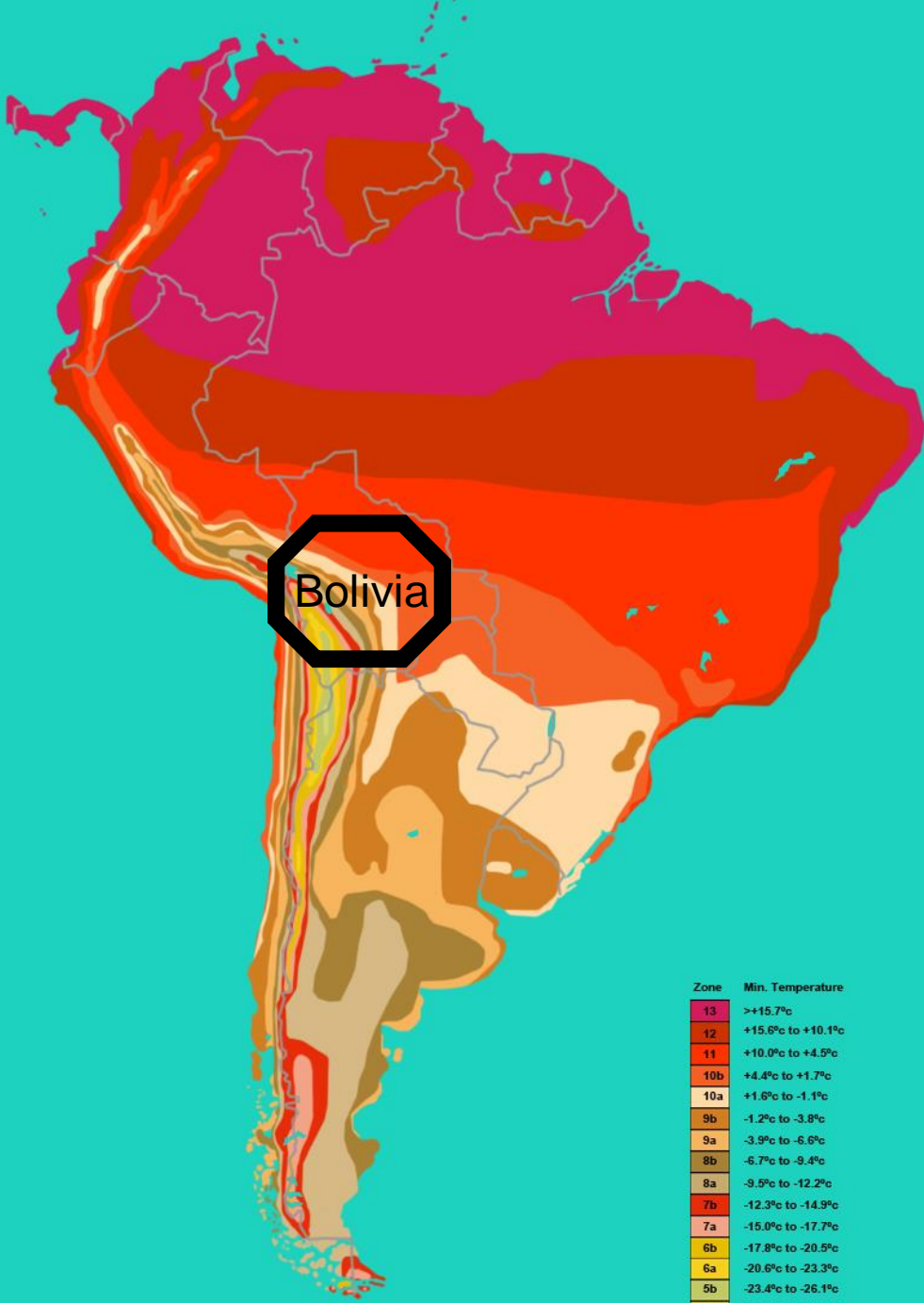
Market Niche

- This plant has the possibility of competing with other ornamental flowering tobacco.
- The limitations of this crop would be cooler weather. Most *Nicotiana* take about three months to reach maturity and flower, so in Minnesota where winter lasts from November to May, there would be only around two to three months of *Nicotiana* flowers, otherwise the plant would stay quite “leafy” and boring until flowers appeared.
- Like other *Nicotiana* species, *Nicotiana wigandioides* could have viscid (sticky) leaves which could be problematic if a person is mulching near the plant and happens to get mulch stuck on the leaves.



Anticipated Cultural Requirements

- In Lapaz Bolivia where *Nicotiana wigandioides* grows, the hardiness zones are 9a, 9b, 10a, and 10b. In the US, these hardiness zones seem to be in the southern, southwestern, and southeastern portion of the country. The ASHS plant heat zone map indicates that based on the hardiness zones where this plant would most likely have optimal conditions in plant heat zones 8 to 11.
- This indicates that *Nicotiana wigandioides* prefers warm, desert-like climates to grow in.



•Nicotiana does well in warmer areas.

Production Schedule

- The estimated time that it takes for seeds of this plant to germinate, according to the results of the experiment, is 7-14 days.
- Newer hybrid varieties begin blooming about 10 weeks after sowing seed, while the species start blooming about 12-14 weeks after planting.
- Roots will re-sprout the following spring however, they may need a mulch of leaves or hay for protection during the winter months.

Needs Assessment for Genetic Improvement

- One thing that might be able to be improved is the viscosity of the leaves. Some people have complained that soil and other debris sticks to the leaves when it is stirred up near the plant. Perhaps if this trait was eliminated, it would make the plant both aesthetically pleasing to the touch and easier to manage if a person needs to cultivate the soil around the plant.
- Another thing that might make this plant a bit better would be to try to raise the germination potential of this plant. Out of all of the seeds used in this experiment, only two germinated. This means that the germination percentage was only 11%.
- Finally, the sturdiness of the stalk could be improved.

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