



Astronium graveolens

Family : Anacardiaceae

Goncalo Alves

Other Common Names: Palo de cera, Palo de culebra (Mexico), Gusanero (Colombia), Gateado (Venezuela), Guarita (Brazil), Guasango (Ecuador).

Distribution: Goncalo Alves is a common tree in the upland forests of many regions from Mexico and Central America through to Colombia, Venezuela, Brazil, and Ecuador.

The Tree: Attains diameters of 24 to 40 in. or more and a maximum height of 120 ft. Except for narrow buttress flanges 4 to 6 ft tall, it has a clear cylindrical trunk for two thirds or more of its height. The logs are typically sound throughout.

The Wood: General Characteristics: When fresh, the heartwood is russet brown, orange brown, or reddish brown to red with narrow to wide irregular stripes of medium to very dark brown. After exposure it becomes brown, red, or dark reddish brown with nearly black stripes. The dingy grayish or brownish-white sapwood, 2 to 4 in. wide, is sharply demarcated. Grain variable, straight to roey; texture fine to medium, uniform; no distinctive odor or taste. The wood often has a striking figure caused by irregular dark longitudinal bands.

Weight: Basic specific gravity (ovendry weight/green volume) averages 0.84 for timber from Honduras and Venezuela; material from Brazil and Colombia averages 0.75. Average air-dry density is about 60 pcf from these four sources.

Mechanical Properties: (First set of values based on 2-in. standard; second set based on 2-cm standard.)

| Moisture content (%) | Bending strength (Psi) | Modulus of elasticity (1,000 psi) | Maximum crushing strength (Psi) |
|-------------------------|---------------------------|--------------------------------------|------------------------------------|
| Green (74) | 12,140 | 1,940 | 6,580 |
| 12% | 16,620 | 2,230 | 10,320 |
| Green (30) | 17,170 | 2,000 | 8,930 |
| 15% | 19,670 | NA | 11,100 |

Janka side hardness 1,910 lb for green material and 2,160 lb for dry. Forest Products Laboratory toughness average for green and dry material from Honduras and Venezuela is 139 in.-lb (5/8-in. specimen).

Drying and Shrinkage: Moderately difficult to season. Some crook and bow accompanied by a slight tendency to twist, checking slight. Air-dries at a fast to moderate rate. A kiln schedule similar to T3-C2 has been suggested. Shrinkage green to oven-dry: radial 4.0%; tangential 7.6%; volumetric 10.0%; slightly higher for Brazilian material.

Working Properties: it is not difficult to work in spite of its high density, finishes very smoothly, and takes a high polish. The wood weathers well and is highly resistant to moisture absorption. It is reported to be difficult to glue.

Durability: Laboratory tests indicate the heartwood to be very durable in resistance to both white-rot and brown-rot organisms. These results substantiate the reputed high durability of this species.

Preservation: Using either hot and cold bath or pressure-vacuum systems, sapwood absorbs only 2 to 4 pcf of preserving oils; heartwood absorbed one-half of this amount.

Uses: Among the most outstanding heavy, durable construction timbers, also highly favored as a fine furniture and cabinet wood. Cut for decorative veneers. It is used for specialty items such as knife handles, brush backs, archery bows, billiard cue butts, turnery, and carving.

Additional Reading: (30), (71), (74)

- 30. Instituto de Pesquisas Tecnológicas. 1956. Tabelas de resultados obtidos para madeiras nacionais. Bol. Inst. Pesqu. tec. Sao Paulo No. 31.
- 71. Villamil G., F. (Editor). 1971. Maderas colombianas. Proexpo, Bogota.
- 74. Wangaard, F. F., and A. F. Muschler. 1952. Properties and uses of tropical woods, III. Tropical Woods 98:1-190.

From: *Chudnoff, Martin. 1984. Tropical Timbers of the World. USDA Forest Service. Ag. Handbook No. 607.*