

Peace Time: A New Yellow-fruit Holly Cultivar

Yiping Zou

College of Forestry, Nanjing Forestry University, Nanjing 210037, China, and Jiangsu Qinghao Landscape Horticulture Ltd. Co., Nanjing 211225, China

Qingguang Li

Wuping Golden Branch Rare Flowers Ltd. Co., Longyan 364399, China

Donglin Zhang

Department of Horticulture, University of Georgia, Athens, GA 30602

Youwang Liang

College of Forestry, Nanjing Forestry University, Nanjing 210037, China

Mingzhuo Hao

College of Forestry, Nanjing Forestry University, Nanjing 210037, China; Jiangsu Qinghao Landscape Horticulture Ltd. Co., Nanjing 211225, China; and National Holly Engineering Center, Hangzhou 311300, China

Yujie Yang

College of Horticulture and Gardening, Yangtze University, Jingzhou 434025, China

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The genus *Ilex* (Aquifoliaceae) consists of more than 500 dioecious tree and shrub species that distributed throughout the temperate and tropical regions (Dirr, 2010; Galle, 1997). Hollies are popular as landscape plants because of their ornamental attributes of various fruit colors (white, yellow, orange, red, black), leaf texture, color and variegation, habit, and their wide adaptation to environmental conditions (Bailes, 2006; Hume, 1953). The bright red color of holly fruits practically defines the plant in the minds of many gardeners. There are ≈2000 known *Ilex* cultivars with more than 90% of them being red-fruited cultivars, whereas less than 6% are yellow-fruited (Galle, 1997; Resch, 2019). Most of these yellow-fruited cultivars were developed in North America and Europe, including *I. aquifolium* ‘Fructu Lutea’ (RHS-13A) (Royal Horticultural Society, 2007), *Ilex* × *attenuata* ‘Bienville Gold’, *I. cornuta* ‘D’Or’ (RHS-13A), *I. decidua* ‘Byers Golden’ (RHS-13A to 13B), *I. opaca* ‘Clemson’ (RHS-15A), and *I. verticillata* ‘Winter Gold’.

Lord’s Holly (*I. rotunda* Thunb.) is a handsome evergreen tree native to the tropical and subtropical regions of the Asia, such as Japan,

Korea, Vietnam, and the south region of China (Dirr, 2016; Hu, 1989). It has been widely used as an ornamental and traditional medicine in China, Japan, and Korea (Chen et al., 2018; Jo et al., 2019; Tezuka et al., 2013). To date, no selections or cultivars of the species have been released for landscape uses. China nourishes rich germplasm resources of *Ilex rotunda* both in nature and cultivation. Selecting novel individuals from seedling populations is an important way to acquire new holly cultivars. Yellow represents honor and dignity in Chinese culture and is deeply loved by the Chinese people. Fruit color, especially yellow, has become one of the primary interests in *I. rotunda* breeding. *I. rotunda* ‘Peace Time’ was selected and released from Nanjing Forestry University’s holly breeding program. Selection was based on its bright and abundant yellow fruits, pale yellow green stems, low broad habit, and superior heat tolerance. It is suitable for shade trees, backyard, park, and many other landscapes and gardens.

Origin

This cultivar was selected from a seedling population in Tianmen Mountain, Longyan

City, Fujian, China. In 2013, Li Qingguang carefully transplanted the plant and grew it in his nursery, which is only 8.2 km from the original population. From 2016 to 2019, the plant was split-grafted to 4-year-old *I. rotunda* seedling rootstocks with survival rate of 100%. The grafted seedlings grew vigorously, forming a 2- to 3-m crown the same year and began to bear berries from the second year. Plant, foliar, fruit color, and growth characteristics of ‘Peace Time’ have been stable and consistent after grafting propagation. In the past 8 years, no serious pests and diseases have been observed.

Description

The distinguishing characteristics of ‘Peace Time’ are yellow fruits, pale yellow green petioles, veins and stems color, and slightly leathery leaves (Table 1). The morphological descriptions are as follows.

Habit. Evergreen tree with an upright-broad-spreading habit, forming a graceful canopy. It will grow to be ≈5 m tall at maturity, with a spread of 3 m.

Foliage. The leaves are simple, entire, slightly leathery; leaf blade elliptic (4–6 cm × 2.8–4 cm) with short petioles from 0.8 to 1.8 cm long. Both leaf surfaces are glabrous with impressed midvein adaxially (Fig. 1).

Flower. Greenish white flowers are small, inconspicuous, and not showy; axillary umbellate inflorescence with three to seven flowers, pedicels glabrous (0.5 to 1.3 cm). Each flower has five deltoid sepals, fused at the base and formed shallowly cup at 2 mm in diameter. Petals are obovate-oblong (4 mm in diameter) and basally slightly connate. Each flower has sterile and staminodes anthers, which are half as long as petals. Pistil has ovate ovary (1.5 mm in length) capitate stigma. The plant starts in blossom in early April.

Fruit. The fruits are yellow, Yellow Group 13A at maturity (Fig. 2), subglobose, 6 to 8 mm in diameter, with five to seven pyrenes and three striate. Fruits are abundant, ripening in November and persist throughout the Winter until next March.

Propagation

‘Peace Time’ is regenerated mainly by grafting during the season before budbreak (March in Fujian, China) using *I. rotunda* seedlings as the rootstock. The current year’s branches with healthy and plump buds are used as scions. The stock is split in the middle to a depth of ≈2.5 to 4 cm. The scion is cut to a wedge ≈1.5 to 2.5 cm long with one side a

Table 1. Comparison of *I. rotunda* Thunb. ‘Rotunda’ and *I. rotunda* ‘Peace Time’.

Comparison items	<i>I. rotunda</i> Thunb. ‘Rotunda’	<i>I. rotunda</i> ‘Peace Time’
Fruit color	Vivid red RHS Color Chart 45A	Vivid yellow RHS Color Chart 13A
Petiole and vein color	Grayish brown RHS Color Chart 166A	Pale yellow green RHS Color Chart 193A
Stem color	Grayish brown RHS Color Chart 166A	Pale yellow green RHS Color Chart 193A
Leaves texture	Thinly leathery	Slightly succulent

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M.H. and Y.Y. are the corresponding authors. E-mail: mingzhuohao@163.com or yjyang@yangtzeu.edu.cn.

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Fig. 1. Branches of *I. rotunda* Thunb. 'Rotunda' and *I. rotunda* 'Peace Time'.

little thicker than the other, then the scion is inserted into the slit and carefully lined up with the cambium layers. The grafted union is wrapped with waxed twine or rubber band strips, which should be removed after scionwood and stock plants are jointed firmly.

Stem cuttings could be also used to regenerate 'Peace Time'. Hardwood stem cuttings were the optimal material and collected from late November to late March at its dormancy stage in winter and before budbreak. Peat



Fig. 2. Mature fruits of *I. rotunda* 'Peace Time'.

moss:perlite (1:1, v:v) or similar propagation substrates worked well. Cuttings were wounded and treated with 3000 ppm indole-3-butyric acid quick dip, resulting in rooting percentages of 40 to 70% in ≈ 6 weeks. Rooted stem cuttings could be potted in 3 weeks into 1-gallon containers and transplanted into the field after 4 weeks growing in the pots.

Cultivation and Pest Management

This is a female variety of the species that requires a male Lord's Holly growing nearby to set fruit. This cultivar does best in full sun to partial shade. It prefers to grow in well-drained acid soil to ensure success, and is subject to chlorosis (yellowing) of the leaves in alkaline soils. It is somewhat tolerant of urban pollution. Plants can survive in U.S. Department of Agriculture (USDA) hardiness zone 8b (U.S. Department of Agriculture-Agricultural Research Service, 2012). Consider applying a thick mulch around the root zone in winter to protect it in exposed locations or colder microclimates. Little pruning is needed if the plant is properly located to allow for its spread. No pests or diseases are of major concern. Leaf spot, scales, and spittle bugs have been observed on this plant.

Availability

'Peace Time' is available in China by Wuping Golden Branch Rare Flowers Ltd. and Nanjing Forestry University. Grafted seedlings are available for restricted trails if you are interested in this new cultivar. Contact Mingzhuo Hao (e-mail: mingzhuohao@163.com) or Wuping Golden Branch Rare Flowers Ltd. Co. for further information.

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