

## Taoyuan No. 3: New high-yield lettuce for subtropical regions

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Driven by consumer demand for local leafy green vegetables, growers in Taiwan are increasingly interested in producing organic and conventional lettuce in high tunnels. In subtropical regions, growing this cool-season leafy vegetable can be a challenge; higher temperatures common in the tunnels during warm seasons can increase the possibility of lettuce bolting (premature growth of a flower stalk).

A new study in *HortScience* evaluated subtropical [lettuce](#) cultivars in [high tunnels](#) year-round. Experiments were designed to determine the feasibility of developing a new high-yield, high-growth cultivar and determine relationships between climatic variables, temperature, and day length, and the days to harvest for maximum marketable yield. Experiments involved nine cultivars commonly grown in Taiwan representing four types of lettuce: leaf, butterhead, romaine, and crisphead (Batavia). Experiments were conducted in high tunnels or growth chambers at the Taoyuan District Agricultural Research and Extension Station from 2008 to 2013.

'Fu San' (a Batavia cultivar) exhibited the highest days to harvest for maximum marketable yield (DMMY) and maximum marketable yield (MMY) among all the cultivars. 'Jhih Li Wo' (a romaine cultivar) had a higher growth rate during [plant growth](#) initiation and 'Fu San' grew more slowly than other cultivars during their entire spring growth. Results showed the lettuce yields were significantly different among planting seasons, cultivars, and interactions for MMY, DMMY, and growth rate before harvest. "Our research suggests that Batavia lettuce 'Fu San',

romaine lettuce 'Jhih Li Wo', and leaf lettuce 'Bai Yeh Wo' are the most suitable cultivars for summer production," the scientists said.

The scientists also assessed the feasibility of integrating plant growth characteristics for developing a new lettuce cultivar for high-tunnel use. "Our studies provided evidence that introducing the high [growth rate](#) trait during the initial period of plant growth from romaine lettuce 'Jhih Li Wo' to the high yielding Fu San cultivar was feasible for developing a new cultivar with early maturity and high yields," the study authors said.

The experiments resulted in the development of a new high-yielding cultivar called 'Taoyuan No.3'.

The study contains further information about production practices and suitable lettuce cultivars that can aid growers in subtropical regions. "Since the DMMY in all cultivars studied was more sensitive to temperature swings, there is a high priority for breeding high temperature-tolerant cultivars with late bolting characteristics to mitigate the effects of global warming and climate changes," the authors said.

**More information:** ASHS *HortScience*: [hortsci.ashspublications.org/c.../50/10/1412.abstract](https://hortsci.ashspublications.org/c.../50/10/1412.abstract)

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