



Mango Industry Development Status of China in 2020

Aiping Gao^{1*}, Ruixiong Luo¹, Jianfeng Huang¹, Zhichang Zhao¹, Yeyuan Chen¹, Yingying Wang^{1*},
Huaping Yu^{1,2}, Tingting Wei^{1,3}

¹Tropical Crops Genetic Resources Institute, Chinese Academy of Tropical Agriculture Science, Haikou, Hainan, 571101, China

²College of Horticulture, Hainan University, Haikou, Hainan, 570228, China

³College of Horticulture & forestry sciences of Huazhong Agricultural University, Wuhan, Hubei, 430070, China

Received Date: August 25, 2022; **Accepted Date:** September 02, 2022; **Published Date:** September 08, 2022;

***Corresponding author:**

Aiping Gao, Tropical Crops Genetic Resources Institute, Chinese Academy of Tropical Agriculture Science, Haikou, Hainan, 571101, China. Email: aipinggao@126.com

Yingying Wang, Tropical Crops Genetic Resources Institute, Chinese Academy of Tropical Agriculture Science, Haikou, Hainan, 571101, China. Email: 1447166293@qq.com

Abstract

China has been the second largest mango cultivation country in the world in 2020. Mango has become the main source of income for mango farmers in some southern provinces and regions such as Guangxi, Yunnan, Hainan and Sichuan. At present, there are more than 40 different varieties cultivated in China. Through the combination of varieties and different climatic regions, and the adoption of comprehensive technical measures such as moving the harvest time forward and postponing the harvest time, China has become the only country in the world that can produce mango annually. At the same time, China has widely adopted a series of technical measures, such as topworking, bagging, integrated disease and pest control, water and fertilizer integration, intercropping cultivation and so on, which has significantly improved the quality of mango fruit, increased its market competitiveness, which can not only meet the domestic market, but also export to foreign countries. In the future, China will further improve the quality of fresh mango fruits, increase the proportion of processed products, and increase the income of mango practitioners.

Keywords: China; industry; mango; quality; technology; varieties

Mango is known as the king of tropical fruit. There are about 110 countries and regions which produce mangoes. China has an area of 35.96×10,000 ha in 2020 and has been the second largest mango production country from information. This paper will mainly summarize the present situation of Chinese mango industry from the aspects of production, variety, technology, processing and trade market. At the same time, it also puts forward some directions for the development of mango industry in the future.

Part 1 Current production situation in China

China has a long history over 1300 years to cultivate mango. Commercial cultivation was started in Taiwan in 1960s and in the mainland in 1980s. According to the data from FAO and the Ministry of Agriculture and Rural Affairs of People's Republic of China, China has become the second mango cultivation country in the world (**Table 1**).

Polity	India	China	Indonesia	Pakistan	Mexico	Thailand	Philippines	Cote d'Ivoire	Nigeria	Egypt
Hectares	2 578 000	359600	275913	214415	213634	211304	195135	169921	132376	128281
Productions in tones	2474800	348350	3617271	2344647	237311	1657589	753103	103420	894103	139524
Footnote			F					F	F	F

Table 1: The Main Production Countries in The World (2020).

(No symbol = official figure F = FAO estimate Source : Food And Agricultural Organization of United Nations: Economic And Social Department: The Statistical Devision)

Commercial cultivation mainly lies in south China, including Guangxi, Yunnan, Hainan, Sichuan, Guangdong, Taiwan, Guizhou and Fujian. (Table.2). Among these provinces and Regions, they are divided into three different

harvest zones, Generally, Hainan belongs to the earliest harvest zone, Guangdong and Taiwan belong to the early to medium harvest zones, Guangxi is a medium mature region, Sichuan and Fujian belong to the latest harvest zones, and Guizhou belongs to mid-late harvest zone. There are early, medium and late maturing mango production areas in Yunnan. Main mango production Counties and Zones are mainly in Table 3. China has become one of the main mango production country.

Zone	Total area	Harvested area	production	Average yield per
	(10,000 ha)	(10,000 ha)	(10,000 metric tons)	ha(tons)
Guangxi	10.36	6.96	94.7	13.6
Yunnan	10.16	7.29	96.2	13.07
Hainan	5.82	5.58	76.5	13.69
Sichuan	5.02	2.57	35	13.63
Guangdong	1.73	1.6	23.5	14.7
Taiwan	1.62	1.6	17.15	10.68
Guizhou	1.21	0.28	4.4	15.74
Fujian	0.04	0.04	0.9	23.42
Total	35.96	25.92	348.35	13.44

Source: Statistics of the Ministry of Agriculture and Rural Affairs of China, 2020

Table 2: Mango Area and Production of China (2020).

Part 2 Main Varieties

China may be one of the origins of *Mangifera*. It is believed *Mangifera hiemalis* J.Y. Liang, *Mangifera sylvatica* Roxb. and *Mangifera persiciformis* C.Y. Wu et T.L.Ming as endemic species of China. The world recognize *Mangifera Indica* L. origins in India. Therefore, most of China's commercial varieties were initially imported from abroad. With the progress of breeding technology in China, more and more breeding researchers have created new varieties and extended them all over the country. China has also selected a number of local varieties from wild and semi-wild resources.

According to available data, China has collected over 1200 accessions of mango and preserved them, most germplasms introduced from abroad. The main conservation units are as follows: ①Tropical Crops Genetic Resources

Institute, Chinese Academy of Tropical Agriculture Science, Haikou, Hainan; ②South Subtropical Crops Research Institute, Chinese Academy of Tropical Agriculture Sciences, Zhanjiang, Guangdong; ③Subtropical Crops Research Institute of Guangxi, Nanling, Guangxi. ④Xishuangbanna Tropical Botanical Garden, Chinese Academy of sciences, Xishuangbanna, Yunnan; ⑤Tropical and subtropical economical crops Institute, Yunnan Academy of Agricultural Sciences, Baoshan, Yunnan; ⑥Sichuan Panzhihua Academy of agricultural and Forestry Sciences, Panzhihua, Sichuan.

Now there are eight provinces and regions producing mango. There are about 20 main mango varieties in different provinces and regions (Table 3.), but they contribute over 95 percent of all the products.

Province and Region	Main County and Districts	Main varieties
Guangxi	Tianyang District, Youjiang District, Tiandong	Tainoung No.1, Guire No.82, Guifei, Jinhwang, Guire No.10, Renong No.1,
Yunnan	Huaping, Yongren, Yongsheng, Yuanjiang, Honghe, Xinpin gm, Longyang, Yognde	Keitt, Guifei, Palayingda, JinHwang, Tainoung No.1
Hainan	Sanya, Ledong, Dongfang,	Guifei, Jinhwang, Tainoung No.1, Taiya, Sensation
	Chanjiang, Lingshui	
Sichuan	Panzhuhua, Liangshan	Keitt, Sensation, Renong No.1
Taiwan	Tainan, Kaohsiung, Pingtung	Irwin, Local Mango, Jinhwang, Keitt, Tainoung No.1
Guangdong	Zhanjiang, Maoming	Dashehari, Tainoung No.1, Jinhwang
Guizhou	Wangmo, Luodian, Xingyi	Jinhwang, Guire No.82, Keitt, Red Ivory, Guifei, Sensation
Fujian	Zhangzhou, Quanzhou	Jinhwang, Guifei, Irwin

Table 3: Main Counties and Districts Producing Mango and Main varieties.

There are over 40 commercial varieties cultivated in China. According to the cultivation area, these varieties are divided into 5 types: 5A, 4A, 3A, 2A and A. (Table 4.). With the rapid development of mango industry in China, the

planting area of these varieties also changes rapidly, In the future, more and more self-selected mango varieties in China will be extended.

Code	Classification Rule	Commercial Varieties
5A	The cultivated area Over 20000 hectares per variety	Tainoung No.1, Keitt, Jinhwang, Guifei, Guire No.82
4A	The cultivated area between 10000 hectares and 20000 hectares per variety	Palayingda, Sensation
3A	The cultivated area between 5000 hectares and 10000 hectares per variety	Renong No.1, Guire No.10, Irwin
2A	The cultivated area between 1000 hectares and 5000 hectares per variety	Zill, Taiya, Dashehari, Red Ivory, Panyu No.2, R2E2, Hongyu, Sannian Mango, Nang Klang Wan, Jingdong Late Mango, Sein Ta Lone.
A	The cultivated area below 1000 hectares per variety	Yuwen, Maqiesu, Repin No.4, Repin No.16, Jinxing, Sanling No.1, Red Keitt, Guinan No.1, Guire No.60, Guire No.71, Guire No.284, Guire No. 80-17, Xiaxue, Xishi, Maya, Panyu No. 4, Panyu No 5, Guire No.4, Guire No.3, Nam Doc Mai, Yunre No.5008, Zillate

Table 3: Classification of commercial cultivars in China.

Part 3 Main Production Technology

Moving the Harvest Time Forward

The key technology of off-season early ripening mango production has been developed, which significantly improves the flowering and fruit setting rate, solves the problem of unstable fruit setting, and the harvest time was 2-4 months ahead of schedule. Because it is harvested in winter and spring, the fruit is sold at a high price, and the grower has a good income.

The main technical points are shoot control by Paclobutrazol (PP333) and flower promotion by potassium nitrate. The main technical points include: ① shoot control: prune and release 2-3 shoots after harvest, before the last shoot maturing, Paclobutrazol was applied to soil and leaves in combination. In terms of soil application, For varieties that are easy to bloom, 10g of 15% Paclobutrazol powder shall be

applied per meter of crown diameter; 15% Paclobutrazol powder (15g) was applied to the soil per meter of crown diameter for the varieties that were difficult to bloom; For other varieties, 12g of 15% Paclobutrazol powder was applied per meter of crown diameter. The specific amount is also related to the soil fertility, the strength of the tree potential and the amount of leaves. In terms of leaf application, About 10 days after the application of Paclobutrazol in soil, the leaves of the last tip of the parent branch are completely ripe (dark green). After that, 50-100 g of 15% Paclobutrazol is dissolved in 15 kg of clear water and directly and evenly sprayed on the surface and back of the leaves. After the leaves are dark green and mature, use "ethephon + meperidol" to control the shoots on the leaf surface, generally spray once every 7-10 days. The interval and the number of spraying depend on the drug effect. Generally, it is appropriate to prevent the new shoots from sprouting during the shoot control period. ② flower promotion: After 2-4 months of shoot control, Spraying potassium nitrate and other chemicals on the leaves to promote

the growth of flower, for example, as mango variety Tainoung No.1, spraying 300-500g potassium nitrate, 150g borax and 15ml acetic acid, 6-8ml of ethephon, 3.33ml of atonik, 15kg of water; ③ promoting the flowering and fruit setting: cutting inflorescence short in bud stage, exogenous application of "spermine + polyaspartic acid + urea" to promote fruit setting. After the technology was applied in the early maturing area, the flowering rate of branches was increased to more than 80%, and the harvest period is 2-4 months ahead of the previous May to July, and from December to May.

Postponing Harvest Time

The technique of postponing the harvest time of mango in late maturing area was developed, which solved the serious problem of "Alternate Bearing" in traditional late maturing area and postponed the harvest time by 2 months.

In view of the serious problem of large temperature difference between day and night in autumn and winter under the natural growth of late maturing production area, the phenomenon of "Alternate Bearing" is easy to appear. The comprehensive technology of "Postponing flowering period + Pruning branches by rotation" was developed. By picking flowers in batches to avoid the influence of low temperature in early spring, about 50% of branches were reserved to hang fruit after the second physiological fruit fall, and the rest branches were cut short to promote summer and autumn

shoots, which were used for cultivating the fruiting branch of next year. The comprehensive application of the technology ensures high and stable yield, and the production period is extended from October to December.

Annual Harvest and Supply

According to the climatic characteristics, production status and development trend of mango in different production areas of China, the mango production in China can be divided into five maturing areas. The early maturing area includes the south-southwest of Hainan, the early-middle maturing area includes the Leizhou Peninsula of Guangdong, the Honghe River Basin of Yunnan and the south of Taiwan; the middle maturing area includes the Youjiang river valley of Guangxi, the Nujiang-Lancangjiang River Basin of Yunnan. The middle-late maturing area includes the southwest of Guizhou and the South of Fujian. The late maturing area includes Sichuan-Yunnan Jinsha River dry hot valley basin.

The harvest period of mango is from April to September only through variety, climate and natural growth before the technology "Moving the harvest time forward" and "Postponing harvest time". After the adjustment of the above two technologies and the perfect combination of varieties and climate, mango can be produced and supplied from January to December. China has been the only country in the world to achieve the annual supply of fresh mango fruits.

Advantage Area	Producing Area	Fruit Harvest Time (month)												
		1	2	3	4	5	6	7	8	9	10	11	12	
Early maturing	the south-southwest of Hainan,	█												█
Early-Middle maturing	the Leizhou Peninsula of Guangdong, the Honghe River Basin of Yunnan and the South of Taiwan						█							
Middle maturing	The Youjiang River valley of Guangxi, the Nujiang-Lancangjiang River Basin of Yunnan							█						
Middle-Late maturing	the Southwest of Guizhou, and the South of Fujian .								█					
Late maturing	Jinsha River dry hot Valley Basin (Sichuan, Yunnan)									█				

Table 4: Annual Supply System of Mango Fresh Fruit.

Quality Improvement

Fertilization and Irrigation

Soil fertility and water has a direct effect on all aspects of mango growth and development. In some cases, post-harvest disorders can be linked directly to the deficiency of a particular mineral, but often other environmental factors such as water stress are involved.

The circular ditch and strip ditch method are mainly used for soil fertilization. ① Circular ditch fertilization: dig a circular or semi-circular ditch outside the drip line of the tree crown, with a width and depth of 15-20cm.; ② Strip ditch fertilization: each year, two parallel strip ditches with width and depth of 20-30cm shall be excavated symmetrically on the outside of the tree crown drip, and the ditch depth shall be more than 60cm when the hole is expanded and the soil is changed.

Based on fertilizer, mainly in the following several times: ① promoting shoot fertilizer. It is based on nitrogen after harvest, there is balanced ternary compound fertilizer, or compound fertilizer plus urea, but also high-nitrogen fertilizer, generally 0.5kg fertilizer and 20kg organic per tree ② controlling shoot fertilizer: potassium chloride or potassium sulfate 0.5kg / per tree, plus calcium superphosphate 0.5 ~ 1 kg / per tree; ③ promoting flower fertilizer: At the stage of pre-flowering or flowering, mainly compound fertilizer, generally 0.5 ~ 1kg / per tree, mainly for abortion fruit promotion; ④ Strengthening fruit growth fertilizer: About 30 days after flowering, the period of rapid growth and development of fruits. Generally, 0.3-0.4 kg urea and 0.2-0.3 kg potassium chloride are applied per tree. Combined with foliar fertilization, 0.2% ~ 0.3% urea plus potassium dihydrogen phosphate solution can be sprayed for 2-3 times continuously, with an interval of 7-10 days.

The amount and frequency of irrigation depends on the soil type and local climatic conditions, especially rainfall and tree age at different times. The key period of irrigation is mainly flowering and fruit setting. The experiment of mango irrigation system showed that the yield and quality of mango were significantly improved by irrigation. The optimal irrigation quantity is 1500 m³ / hm², the best irrigation times are 6 times. The best irrigation time is 1 time in autumn shoot, 1 time in flower bud differentiation, 2 times in flowering and fruit setting, and 2 times in fruit expansion.

Pest and Disease Control

According to the investigation, more than 50 diseases and 140 pests have been found in mango, but only 20 of them have caused great losses to production. The main diseases are anthracnose (*Colletotrichum gloeosporioides*), bacterial black spot (*Xanthomonas campestris v. mangiferae indicae* Robbs), powdery mildew (*Oidium mangiferae* Berthet), and the main pests are scitothrips dorsalis (*Scirtothrips dorsalis* Hood), leaf gall Midge (*Erosomyia mangiferae* Felt), leaf cutting weevil (*Deporaus marginatus* Pascoe), chilumeta traversa (*Chlunetia*

transoersa Walker), etc. In production, pesticides should be used alternately to avoid resistance to diseases and insect pests. The usage and dosage of pesticide shall be in accordance with the instructions of the pesticide. Acid and alkaline pesticides cannot be mixed. The traditional pest and disease control is mainly chemical control. It is necessary to advocate the green prevention and control concept of "prevention first, prevention combined with treatment", strengthen the research on agricultural prevention and control, physical prevention and control, biological prevention and comprehensive prevention and control, and gradually reduce the frequency and dose of chemical agents.

Bagging

Mango bagging has the following advantages: ① to make fruit surface smooth and delicate, the color is uniform; ② to improve the internal quality of fruit; ③ to reduce the spraying frequency, to lower pesticide residues and production costs; ④ to improve fruit storability to extend the shelf-life. In general, Red mangoes are usually covered with a single layer of white bags, while yellow mangoes are usually covered with a double layer of bags, with yellow outside and black inside. Bagging is carried out when the young fruit size is about the same as that of the egg after the second physiological drop. Fruits are harvested 2-3 months after bagging. For varieties with red or purplish red peel, the fruit bags are usually removed 2-3 weeks before harvesting to promote color enhancement.

Intercropping

Orchard intercropping can reduce soil and water loss, improve soil physical and chemical properties, regulate soil temperature, increase soil microbial content, reduce the application of chemical fertilizers and pesticides, and improve the fruit quality of mango. After years of trial planting comparison, butterfly pea was selected as the most suitable grass species in mango orchard. Compared with the control, the yield increased by 6% and the soluble solid content increased by 2.3%. At present, the main intercropping crops are legumes.

Storage

Post-harvest fruit must be washed in the detergent within 24 hours, after drying followed by the hydrothermal (53 ± 1 °C) 50% bennomylor thiabendazole 1000~2000ppm soaking the fruits of 10 to 15 minutes, to prevent and control anthracnose, stem end rot. Fruit classification should firstly lies in their appearance, and then the size of fruits, and then they should be transported away after packaging. As for storage, Fruits should be stored in low-temperature. In the modified atmosphere storage context, Wang Jianli et al (1997) reported that effective storage of mango can be obtained at 11 ~ 12 °C under the conditions of use of 5% carbon dioxide and 5% oxygen. Chen Guoping et al (2005) reported that before marketing of fruits, fruits should be dealt with ethylene or

acetylene gas 24 hours in order to improve the quality of the fruit, and to make the fruits of the same yellow, bright color and so on. Fruit picking and packaging should be completed within 24-48 hours.

Top working

The technology of “Top working” is based on the original mango tree, through heavy pruning, part of the trunk and branches are retained, and the buds or branches of the new varieties are grafted onto the branches of the old varieties (stock -old variety as interstock-new variety) . It can be grafted the first year and bear fruits the following year. It can be harvested 2 years earlier than replanting seedlings.

Top working time is different in different Eco climatic regions of china. Generally, from April to May, the trees grow vigorously, rarely rain, and the temperature is appropriate, so the grafting survival rate is high.

A vigorous, healthy mature tree may be cut off 1-2 m above the ground and treated with pruning scissors and saws. 5-50 sprouts will grow out from the trunk, when new shoots get matured, most of them can be grafted into desired variety. Generally, the number of grafted branches or buds of trees with low positions is about 5-20; and the number of grafted branches of trees with high positions is about 20-50.

Part 4 Processing

Because the price of fresh mango in China is generally better, farmers mainly sell fresh fruits, and few enterprises or farmers sell fresh fruits to processing enterprises, unless they are inferior fruits or there is a large backlog of fruits. Therefore, the processing enterprises are faced with the difficulties in purchasing fresh fruits. At present, Chinese processing enterprises mainly import fresh mango or raw juice from southeast and South Asian countries such as Vietnam, Thailand, Peru, Philippine, Australia and India. The main processing products of mango are mango juice and mango meat. Other mango products include dried mango, jam, canned mango, syrup, fruit wine, fruit vinegar and puffed food etc.

In addition, mango branches, leaves, peel and seeds contain bioactive substances, which can be used for functional production and may be a good source of potential nutrients. For example, mango leaves have been used to produce cough tablets, and mango leaf extract can enhance the ability of aquatic animals to prevent diseases.

Part 5 Domestic and Foreign Markets

Although China is a major producer of mango in the world, it accounts for a low proportion in the international trade market. On the whole, China's sales are mainly domestic. China's international trade shows an upward trend. In 2020, according to the statistics of China Customs, 84139.6 tons of fresh mangoes were imported from Chinese Mainland alone,

accounting for 4.06% of the total output of mangoes in mainland China. China exported 44407.4 tons of mangoes. The import volume of mango is far greater than the export volume. The import volume is the largest from February to may, and the highest import volume occurs in April. The export volume is the largest from June to September, and the highest occurs in July. In addition, there is a certain mango border trade between China and Vietnam, but there is no statistical data.

Part 6 General Remarks and prospects

China has been the Second largest mango cultivation country and has made a great progress in Mango production in recent years, however , it is not yet the major mango exporting and importing countries. Through variety, technology and climate conditions, China has succeeded to realize the annual production and supply. The quality of fresh mango produced in China is getting better and better, and the quality of some fruits can exceed the quality of imported mangoes. China's mango cultivation technology is increasingly recognized by other countries. In the future, China will continue to strengthen research and promotion on mango breeding, cultivation technology and quality improvement and post-harvest preservation treatment and processing, and constantly expand domestic and international markets. With Chinese high-quality fresh mangoes and products gradually go to different countries in the world, mango growers and producers of processed products will gain more benefits, mango industry will be better in the future.

Breeding technology and expected results mainly involved in the following aspects:1) Establishing a national joint breeding mechanism that unites scientific and educational units of different provinces and regions to improve breeding efficiency;2)Sharing mechanism on mango genetic resource information ;3) New varieties should have the following characteristics: moderate size (about 500g), beautiful appearance, different maturity, strong disease and insect resistance, moderate sugar and acid, strong aroma, strong storage resistance, excellent quality and high yield;4)Cooperative demonstrating and rapid promoting new excellent varieties.

Cultivation technology and quality improvement mainly involved in the following aspects:1)Reducing the use and frequency of chemical fertilizers, pesticides and plant growth regulators;2)Carrying out integrated control and biological control of diseases and pests;3) Studying on the application of water and fertilizer together;4)Improving the regulation technology of mango production period, and focus on early and late ripening;5)Technique of intercropping in mango orchard;6)Low cost production technologies such as light simplification, small mechanization and labor saving.

Post-harvest preservation treatment and processing are mainly involved in the following aspects:1)Establishing a batch of standardized demonstration plants for mango

postharvest preservation treatment (Sterilization, air drying, size grading, automatic packaging, pre-cooling and refrigeration); 2) Establishing logistics warehousing and distribution centers in major mango producing areas (Sorting, packaging, transit storage, temporary preservation and ripening); 3) All long-distance fruits should be sterilized and kept fresh; 4) Developing a series of products such as mango juice, dried mango, mango pulp, dried mango and mango wine and so on to increase added value.

Supported by

① The Key R & D project of Hainan Province "Protection and utilization of core mango germplasm resources with excellent agronomic characters" (ZDYF2020052); ② National Key R & D project of the Ministry of science and technology "Accurate evaluation and gene discovery of Tropical Crop Germplasm Resources" (2019yfd1000500); ③ The earmarked fund for China Agriculture Research System (CARS-31); ④ Material resources protection project of the Ministry of Agriculture and Rural Affairs "Conservation of mango germplasm resources".

*Author for correspondence: E-mail: <aipingao@126.com>.

References

- ERS Online. Economic Research Service, United States Department of Agriculture, Washington, D.C.
- FAOSTAT. 2020. FAO Statistics, Food and Agriculture Organization of the United Nations, Rome, Italy.
- The Office of development to the Subtropical Crops, the Ministry of Agriculture and Rural Affairs of P.R.China, National Tropical subtropical crop production (2020).
- China Agricultural Reclamation economic development center, South Subtropical Crop center of the Ministry of Agriculture and Rural Affairs of P.R.China, Development Report of Tropical Crops Industry (2020) China Agricultural Science and Technology Press, 92-104.
- USDA Online. Foreign Agricultural Service, United States Department of Agriculture, Washington, D.C.
- Sauco V (2004). Mango production and world market: Current situation and future prospects. *Acta Horticulturae* 645:107-116.
- Richard J Campbell, Noris Ledesma, Carl W Campbell (2002). *Tropical Mangos; How to grow the world's most delicious fruit*.
- Richard E. Litz. *The mango Botany, Production and Uses*, 1997. CAB International.
- Gao Aiping, Luo ruixiong, Huang Jianfeng etc, the current situation of mango industry in South Asian countries. *Chinese Journal of Tropical Agriculture*, 2019, 86:19-21.
- He Meiyong, Zhao Ping, Lin Yiying (2018). An analysis of the border trade between Vietnam and China. *South China Fruits*. 47:153-157.
- Liu Fengyi, Zhou Jiabin, Jin Ming, etc, *Comprehensive Utilization of By-products in Mango Production*. The Food Industry. 2018. 39:263-265.
- Fu Guohua, Han Liyue, Xu Nengrui. Current situation of mango industry chain in China. *Tropical Agricultural Science & Technology*. 2018. 31:27-31.
- He Cuicui, Feng Huande, Wei Zhiyuan, etc. Evaluation of current fertilization status in Hainan Island mango orchard. *Soil and Fertilizer Sciences in China*. 2019 122-129.
- Guo Pan, Li Xinjian, Su Shihua, etc. Experimental Study on Mango Irrigation Regimes in Youjiang River Valley of Guangxi. *Water Saving Irrigation*. 2018(6):58-61.
- Xie Guogan, Xie Bingqiang, Lin Youhe, etc. The present Situation, Existing Problems, And Countermeasures of Hainan Mango Industry. *Natural Science Journal of Hainan University*, 2000, 18:293-297.
- Wang Yuanli, Qing Dakui, Li Guizhen, et al. (2004). Effects of Bagging on Fruit Quality of Mango. *Chinese Journal of Tropical Agriculture*, 24:9-12.
- He Xinhua, Li Yangrui, Guo Yongze, et al. (2005) Inter-simple sequence repeat (ISSR) analysis of different native mango cultivars in Guangxi. *Molecular Plant Breeding*, 6:829-834.
- Lei Xintao, Zhao Yanlong, Yao Quansheng, etc. (2006) Identification and analysis of the resistance of different mango cultivars to anthracnose (collectotrochum gloeosporioides). *Journal of Fruit Science*, 23:838-842.
- Huang Shenming, Liu Xiujuan, Zhang Kaiyun, et al. (1993). Application of plant growth regulators to induce mango flowering. *China Fruits*, (4):22-23, 25.
- Wang Jianrong, Yan Xiaoxia, Li Hongli (2006). Off-season cultivation techniques of mango "Tainong No.1". *China Tropical Agriculture*, (4):55-57.
- Li Guizhen, Qing Dakui, Li Guili (2006). Experiment on rotation fruit hanging technology of Keitt mango. *Tropical Agricultural Science & Technology*, 29:36-38.
- Gao Aiping, Chen Yeyuan, Luo Ruixiong, et al. Development status of Chinese mango industry in 2018. *Advances in Agriculture, Horticulture and Entomology: AAHE-104*. 2019(1):1-6.
- Zhan Rulin, He Yanbiao. *Diagnosis and control diagram of main diseases and pests of mango*. China Agricultural Press, 2018.

Citation: Gao A, Luo R, Huang J, Zhao Z, Chen Y, et al. (2022) *Mango Industry Development Status of China in 2020*. *Adv Agri Horti and Ento: AAHE-175*.