記入日　2020 年　6 月 18 日

会社・団体名	JNC株式会社 英文名：JNC CORPORATION			
技術・設備名	Soilless 栽培システム			
分類		（1）省エネルギー	○	（5）水処理
		（2）新エネルギー	○	（6）土壌汚染防止・土壌改良
		（3）大気汚染対策		（7）スマートシティ
		（4）循環経済	○	（8）その他
特徴（PRポイント）	土を利用せず、栽培の培地には杉バーク（樹皮）やココピート（ヤシ柄）を利用している（破棄物の積極利用）。また、樹の成長に必要な最低限の液肥（水と肥料）しか与えないので、水資源が有効に利用され、余剰肥料による土壌汚染がゼロである。加えて土壌由来の病気に感染しないので、農薬も最小限で良い（減農薬）。また、栽培に特殊なフィルムなどを用いないので、廃棄物も少ない。			
具体的な省エネ・環境効果、経済性	露地栽培、養液土耕栽培に比べて、液肥（水と肥料）の使用量が少なく、土壌汚染もない。 かん水の使用量は養液土耕に比べて約 1/3、農薬の量は 1/2 から 1/3 となり、しかも栽培ベッドは土壌と隔離されているので、流出はしない。			
概要・原理				
実績	熊本県で 2010 年から、大分県で 2016 年から栽培、販売を実施している。			

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JNC's Agriculture Business

Development of Soilless Cultivation System

April 5, 2019

Corporate Research and Development Division
JNC CORPORATION

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Milestones in JNC's Soilless Cultivation System Development

2010 - Started research and development of Soilless Cultivation System at Minamata Research Center
(Experimental greenhouse: 4a=400m^2)

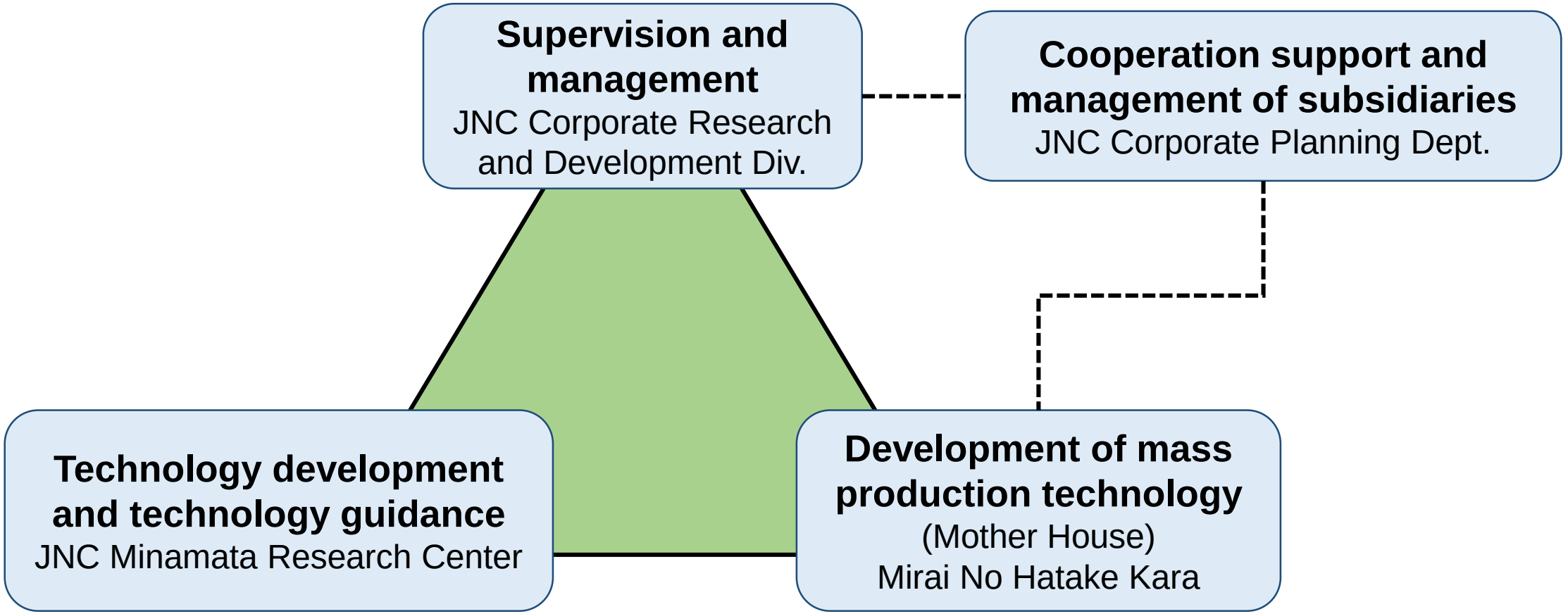
2012 - Started cultivation of tomatoes with high sugar content in a small-scale greenhouse of 12a (1,200m^2) and conducted test marketing

2015 - Studied scaling-up of Soilless Cultivation System in a high-wire greenhouse of 30a (3,000m^2) for stable yield and quality

2016 - Constructed full-scale cultivation facilities (1ha=10,000m^2) in Kusu town, Oita to verify feasibility of commercialization, and started full-scale cultivation and year-round marketing of tomatoes with high sugar content using Soilless Cultivation System. Currently marketed to high-class vegetable shops, supermarkets, restaurants, etc.

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JNC's Team Organization



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Issues Surrounding Agriculture and Food



Increase in needs for foodstuffs as a result of diversification of diets (taste, visual perception, etc.) (middle/upper-class consumers)



Increase in food security and safety consciousness (middle/upper-class consumers)



Stable supply of foodstuffs not affected by climate change and know-how (tacit knowledge)



Environmental issues (pollution) and shortage of water resources as a result of rapid economic development

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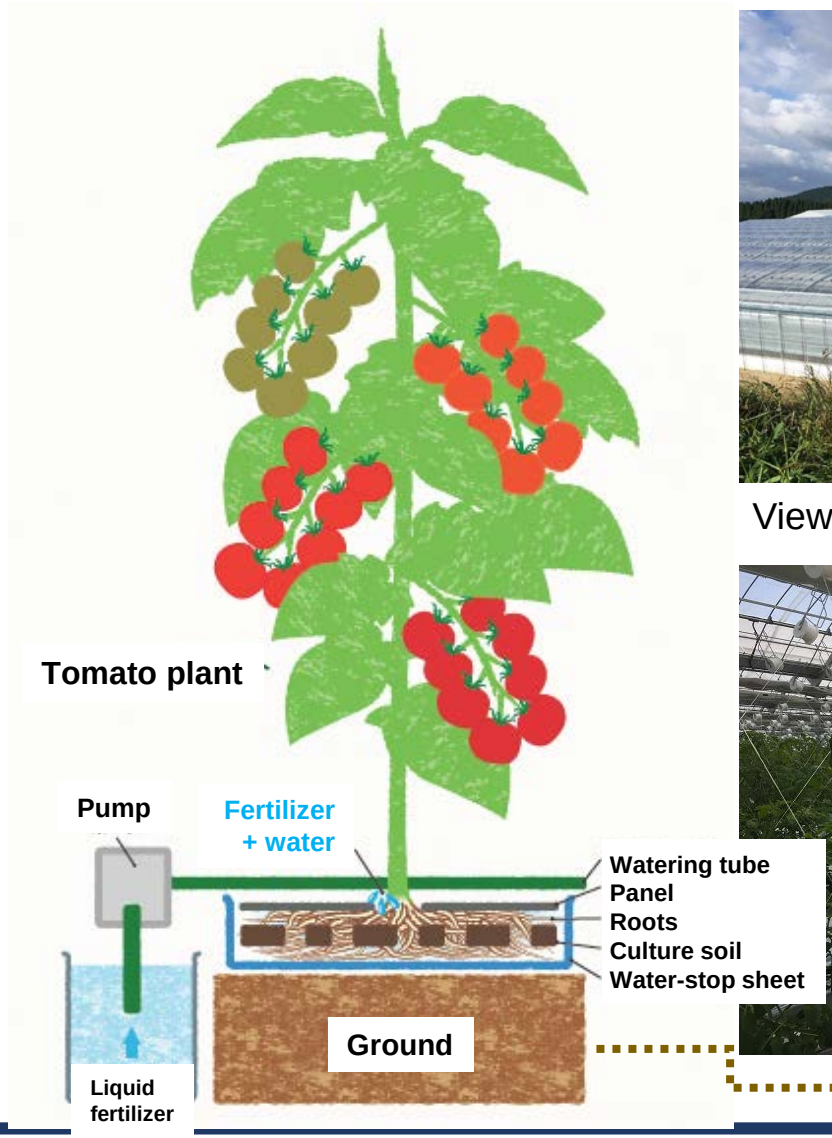
JNC's Approach to Resolving Issues

JNC Soilless Cultivation System is used in solar-powered plant factories (Smart Greenhouses) that use environmental control and manufacturing technology to satisfy customer needs (quality, timing of supply, etc.).

● Stable production	Implementation of environmental control and cultivation management by sensors and IoT
● Security, safety, reduction of environmental load	Management of minimum required cultivation fluid (water and fertilizer) Reduction in use of agrochemicals as a result of soil sterilization being unnecessary
● High (stable) quality (good taste)	Quality management by non-destructive measurement of sugar content and size

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Overview of JNC Soilless Cultivation System

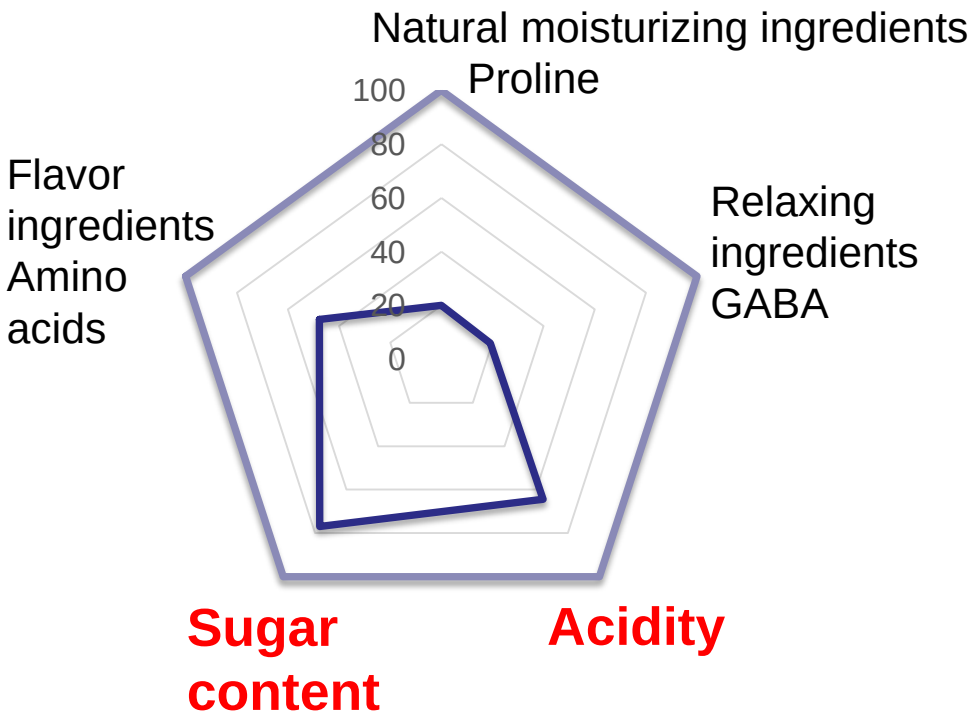




View of full-scale greenhouses in Oita



Cultivation in raised beds in Oita

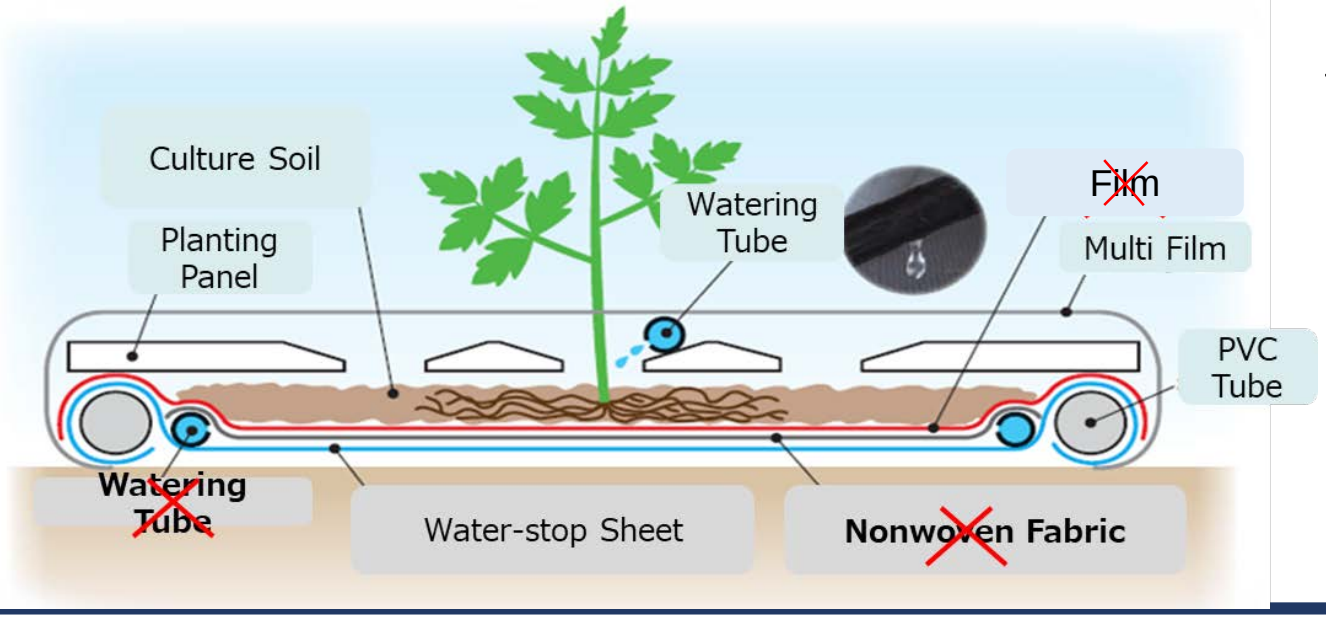


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Comparison with Competing Technologies

Cultivation technologies for tomatoes with high sugar content successful in Japan

	Initial cost	Cultiva-tion cost	Labor cost	Yield	Taste	Weatherp roof	Environ-ment proof	Pest resistance	Profit-ability
JNC soilless	○	○	○	△	◎	○	○	○	○
Soil culture	○	◎	○	○	○	△	×	×	△
Hydroponics	○	○	○	○	○	○	△	○	△
Film culture	△	△	○	△	◎	○	○	○	○



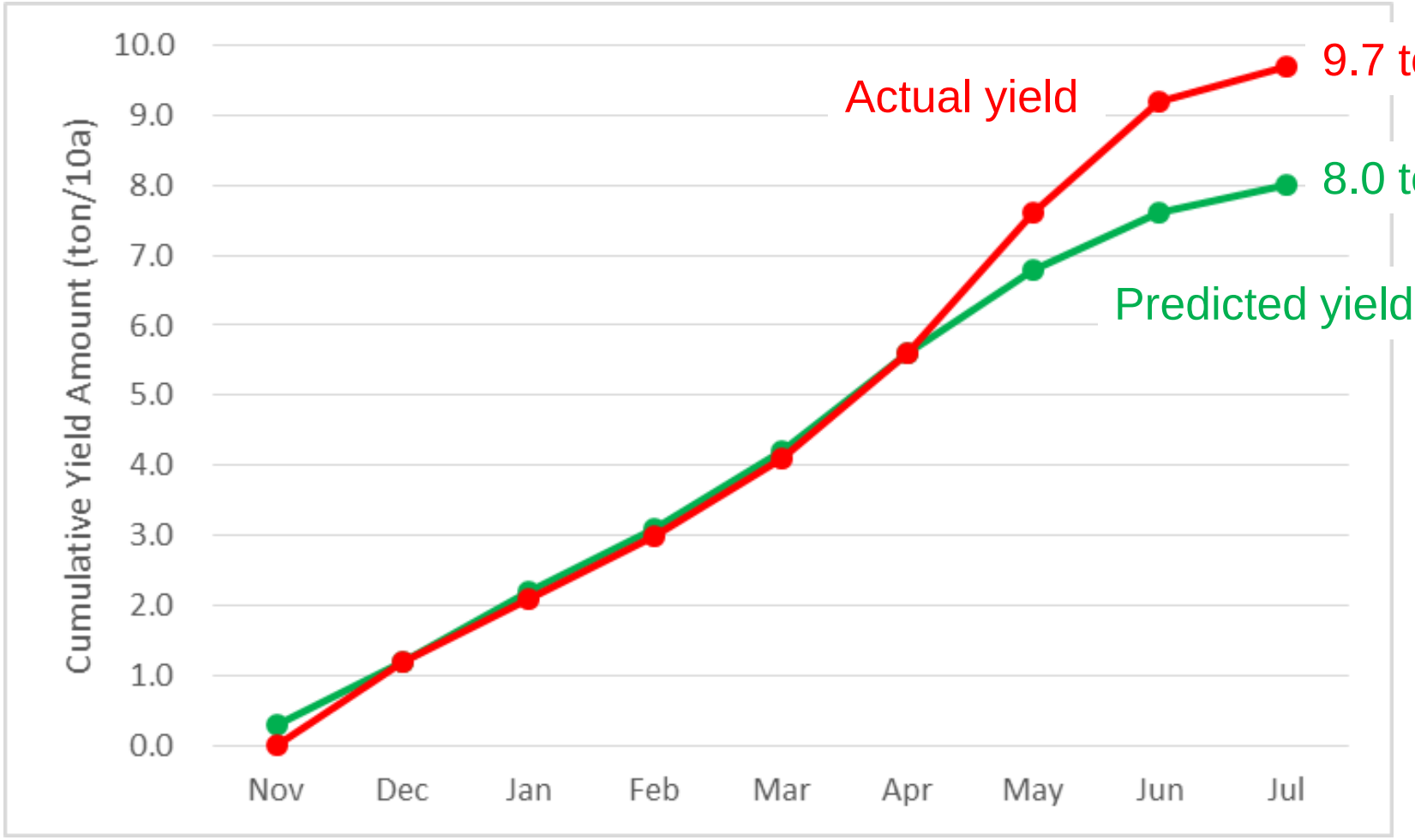
Advantages of Soilless Cultivation System

- Inexpensive initial facility cost compared to hydroponics and film cultivation (1/2~1/4 of hydroponics)
- Simple structure of cultivation beds compared to film system
- Achievement of high sugar content simply by controlling cultivation fluid

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Success of JNC Soilless Cultivation System Technology

Yield per 10a at Minamata in 2016/2017

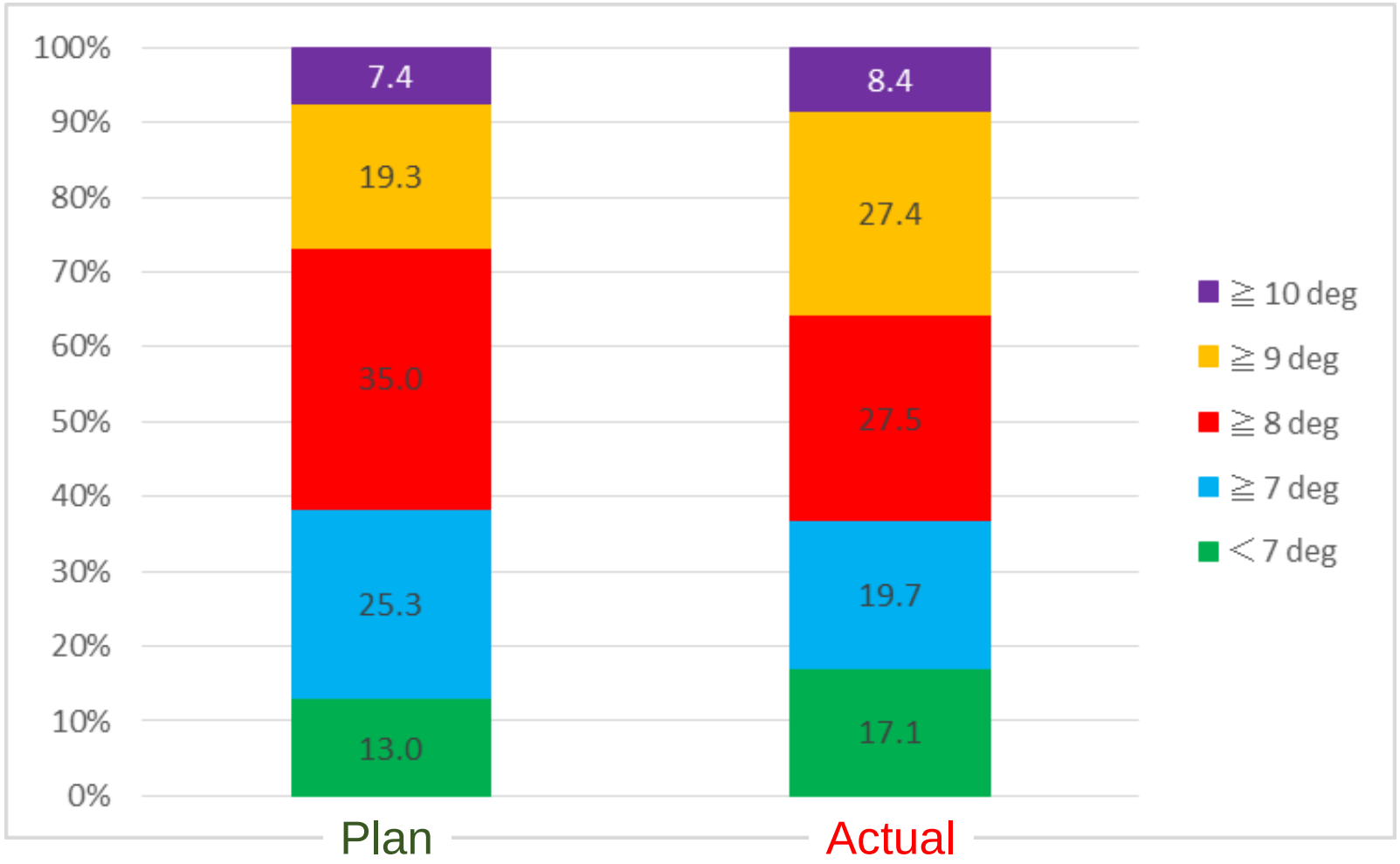


* Actual yield fit the predicted yield, resulting in satisfaction of customer purchase plan

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Success of JNC Soilless Cultivation System Technology

Sugar content distribution at Minamata in 2016/2017



*Ratio of sugar content of 8 degrees Brix or higher was approximately as planned.
The actual average sales unit price exceeded the planned price.

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Sellers of Tomatoes with High Sugar Content

High-class vegetable shops in department stores



High-class restaurants



High-class supermarkets



Roadside rest stops





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Summary 1

JNC aims to realize smart agriculture to provide:

High quality	⇒	“stable” quality
High productivity	⇒	“stable” productivity
High price	⇒	“stable” price

in order to meet the needs of customers (society).