

### **AP3.**

## **PROTECTED CULTURE FOR YIELD STABILITY AND HIGH QUALITY OF TOMATO UNDER DIFFERENT WEATHER AND AGRO-CLIMATIC CONDITIONS**

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Protected (indoor) culture is renowned for high yield, quality and production stability of crops in a range of undesirable environments. Therefore, the applicability of protected culture to Sri Lankan vegetable cultivation was investigated in two steps. In the first step, indoor structures and few improved technologies were compared with the conventional open-field culture in two seasons. In the second step, the treatments were further modified and tested under different farmer situations and agro-ecological conditions.

In the first step, the highest yield was reported by the polythene house under rainy conditions (during *Yala*) and the shed house under dry conditions (during *Maha*). The effect of indoor culture on marketable fruit number, fruit damages and locular materials varied with the weather. Improved technology produced high quality fruits under rainy conditions. Improvements in the yield and fruit quality indicated a potential increase in farmer income despite the high cost of protected culture. In the second step, protected culture (modified) and the location, Rahangala assured enhanced yield components, fruit size and damage-free fruits. In addition, the interactions gave rise to higher yield components and fruit size at Rahangala and high acidity and locular material content at Peradeniya under protected culture. The fruits at Peradeniya had the highest Brix value. High and stable farmer income was reported due to high fruit quality, and yield assurance at Rahangala during extremely high rainy season.

The polythene house with improved technology was more productive and economical for the agro-ecological conditions at Rahangala in terms of yield and external fruit quality of tomato while it was more suitable for Peradeniya in terms of internal fruit quality of tomato.