

# 澎湖農業改良

## 澎湖地區紅龍果品種選育及安全優質栽培技術之建立

朱堉君、施純堅

本研究之目的包括紅龍果種原蒐集、新品種選育及建立適合澎湖地區紅龍果的優質、安全栽培技術。本(100)年度共蒐集 6 個品系(種)，包括 *Hylocereus* 屬 4 種、*Selenicereus* 屬 1 種及 *Hylocereus* 與 *Selenicereus* 的雜交品種 1 種，均已種植在澎湖分場的種原圃。雜交育種目標為改善紅龍果多刺及紅肉自交不親合性，以利栽培省工化，並擬以雜交育成特殊果皮與果肉色系之新興品系以增加紅龍果多樣性。本試驗以短刺品系、越南白肉、雙色品系及帝龍等 4 個品系(種)為親本，進行雜交，獲得 6 個雜交組合，實生苗約有 3,000 株，已完成嫁接者有 400 株，其中 250 株已定植於選種圃內進行新品系(種)選育工作。為提高澎湖地區紅龍果品質，以灰色、藍色不織布及白色紙袋進行套袋試驗，目前已知以灰色不織布套袋的著色最佳，且不影響果實品質，本年度進一步比較套袋後，於不同花後天數採收之果實品質，結果顯示，在花後 33-37 天，各種套袋的著色、可溶性固形物及果肉率較佳，為最適採收期，可確保紅龍果之果實品質(表 1-6，圖 1)。

表 1. 澎湖地區不同採收天數對灰色不織布套袋之紅龍果果實品質之影響

Table 1. The influence of harvest day after bloom with grey non-woven fabric bag on fruit quality of pitaya in Penghu.

| Harvest season <sup>2</sup> | Harvest day after bloom | Individual fruit wt. (g) | Peel thick (mm) | Total soluble solid (average) (°Brix) | Total soluble solid (central) (°Brix) | Pulp wt. percentage of fruit (%) |
|-----------------------------|-------------------------|--------------------------|-----------------|---------------------------------------|---------------------------------------|----------------------------------|
| Summer                      | 28                      | 383.9 a <sup>1</sup>     | 5.5 a           | 13.9 b                                | 15.9 b                                | 51.4 c                           |
|                             | 30                      | 365.2 a                  | 4.9 a           | 14.8 a                                | 17.2 a                                | 55.8 bc                          |
|                             | 33                      | 391.9 a                  | 2.7 b           | 15.0 a                                | 17.5 a                                | 69.0 a                           |
|                             | 37                      | 344.5 a                  | 2.5 b           | 15.1 a                                | 17.3 a                                | 65.0 ab                          |
| Autumn                      | 28                      | 382.0 a                  | 2.3 a           | 13.8 b                                | 16.3 b                                | 69.1 a                           |
|                             | 30                      | 443.1 a                  | 3.4 a           | 13.8 b                                | 16.3 b                                | 66.1 a                           |
|                             | 33                      | 516.7 a                  | 2.5 a           | 15.3 a                                | 18.1 a                                | 72.0 a                           |
|                             | 37                      | 418.8 a                  | 2.7 a           | 14.6 ab                               | 17.5 ab                               | 72.0 a                           |

<sup>1</sup> Results within column followed by the same letter are not significantly different by LSD test at 0.05 level.

<sup>2</sup> summer : harvest at August 16; autumn : harvest at October 25.

表 2. 澎湖地區不同採收天數對灰色不織布套袋之紅龍果著色之影響

Table 2. The influence of harvest day after bloom with grey non-woven fabric bag on peel color of pitaya in Penghu.

| Harvest season <sup>2</sup> | Harvest day after bloom | Shading side         |         |         | Exposed side |         |        |
|-----------------------------|-------------------------|----------------------|---------|---------|--------------|---------|--------|
|                             |                         | L* <sup>3</sup>      | A*      | b*      | L*           | a*      | b*     |
| Summer                      | 28                      | 48.29 a <sup>1</sup> | 21.69 c | 7.60 a  | 34.75 a      | 16.07 a | 9.48 a |
|                             | 30                      | 48.75 a              | 29.08 b | 5.85 ab | 41.78 a      | 22.09 a | 9.59 a |
|                             | 33                      | 46.65 a              | 35.63 a | 3.66 b  | 40.28 a      | 21.83 a | 8.92 a |
|                             | 37                      | 45.08 a              | 37.04 a | 3.52 b  | 42.79 a      | 27.95 a | 7.56 a |

| Harvest season <sup>2</sup> | Harvest day after bloom | Shading side    |         |        | Exposed side |         |        |
|-----------------------------|-------------------------|-----------------|---------|--------|--------------|---------|--------|
|                             |                         | L* <sup>3</sup> | a*      | b*     | L*           | a*      | b*     |
| Autumn                      | 28                      | 46.28 a         | 32.08 a | 4.22 b | 41.95 a      | 27.36 a | 5.31 a |
|                             | 30                      | 37.01 b         | 19.76 b | 8.72 a | 46.62 a      | 29.51 a | 4.06 a |
|                             | 33                      | 47.03 a         | 33.79 a | 2.06 b | 38.83 a      | 26.11 a | 4.42 a |
|                             | 37                      | 46.55 a         | 33.82 a | 1.92 b | 41.43 a      | 24.55 a | 7.21 a |

<sup>1,2</sup> 同表一。

<sup>3</sup> L\*,a\*,b\* : measurement color of equatorial fruit with sphere spectrophotometer; L\*(brightness), a\*(red + -green -), b\*(yellow + -blue -) value.

表 3. 澎湖地區不同採收天數對藍色不織布套袋之紅龍果果實品質之影響

Table 3. The influence of harvest day after bloom with blue non-woven fabric bag on fruit quality of pitaya in Penghu.

| Harvest season <sup>2</sup> | Harvest day after bloom | Individual fruit wt. (g) | Peel thick (mm) | Total soluble solid (average) (°Brix) | Total soluble solid (central) (°Brix) | Pulp wt. percentage of fruit (%) |
|-----------------------------|-------------------------|--------------------------|-----------------|---------------------------------------|---------------------------------------|----------------------------------|
| Summer                      | 28                      | 259.2 a <sup>1</sup>     | 6.5 a           | 14.1 b                                | 16.9 a                                | 40.7 b                           |
|                             | 30                      | 315.6 a                  | 4.5 a           | 14.8 ab                               | 17.4 a                                | 46.7 b                           |
|                             | 33                      | 363.5 a                  | 2.9 c           | 15.4 a                                | 18.0 a                                | 69.3 a                           |
|                             | 37                      | 259.2 a                  | 3.6 bc          | 14.6 ab                               | 16.5 a                                | 56.2 ab                          |
| Autumn                      | 28                      | 387.6 a                  | 3.1 b           | 13.8 a                                | 16.2 a                                | 60.4 a                           |
|                             | 30                      | 393.3 a                  | 3.8 a           | 13.6 a                                | 15.9 a                                | 57.7 a                           |
|                             | 33                      | 473.2 a                  | 2.6 c           | 14.9 a                                | 17.1 a                                | 69.0 a                           |
|                             | 37                      | 456.9 a                  | 3.2 b           | 14.2 a                                | 16.1 a                                | 64.4 a                           |

<sup>1,2</sup> 同表一。

表 4. 澎湖地區不同採收天數對藍色不織布套袋之紅龍果著色之影響

Table 4. The influence of harvest day after bloom with blue non-woven fabric bag on peel color of pitaya in Penghu.

| Harvest season <sup>2</sup> | Harvest day after bloom | Shading side         |          |          | Exposed side |         |         |
|-----------------------------|-------------------------|----------------------|----------|----------|--------------|---------|---------|
|                             |                         | L* <sup>3</sup>      | a*       | b*       | L*           | a*      | b*      |
| Summer                      | 28                      | 37.38 a <sup>1</sup> | 10.05 b  | 14.66 a  | 33.21 bc     | 8.06 a  | 15.37 a |
|                             | 30                      | 39.17 a              | 20.23 ab | 11.51 ab | 31.55 c      | 7.67 a  | 14.54 a |
|                             | 33                      | 42.34 a              | 24.36 a  | 9.40 ab  | 39.76 a      | 17.12 a | 11.61 a |
|                             | 37                      | 41.60 a              | 29.19 a  | 7.15 b   | 38.05 b      | 16.93 a | 11.45 a |
| Autumn                      | 28                      | 40.09 a              | 27.71 a  | 5.86 b   | 33.08 b      | 24.25 a | 9.72 a  |
|                             | 30                      | 29.10 b              | 13.19 b  | 11.77 a  | 46.37 a      | 27.64 a | 9.01 a  |
|                             | 33                      | 43.90 a              | 31.53 a  | 5.36 b   | 38.32 b      | 25.01 a | 7.90 a  |
|                             | 37                      | 44.85 a              | 34.31 a  | 3.02 b   | 37.48 b      | 23.29 a | 6.93 a  |

<sup>1,2</sup> 同表一，<sup>3</sup> 同表二。

表 5. 澎湖地區不同採收天數對白色紙袋套袋之紅龍果果實品質之影響

Table 5. The influence of harvest day after bloom with white-paper bag on fruit quality of pitaya in Penghu.

| Harvest season <sup>2</sup> | Harvest day after bloom | Individual fruit wt. (g) | Peel thick (mm) | Total soluble solid (average) (°Brix) | Total soluble solid (central) (°Brix) | Pulp wt. percentage of fruit (%) |
|-----------------------------|-------------------------|--------------------------|-----------------|---------------------------------------|---------------------------------------|----------------------------------|
| Summer                      | 28                      | 290.1 a <sup>1</sup>     | 5.1 a           | 14.5 a                                | 16.4 a                                | 47.8 c                           |
|                             | 30                      | 348.9 a                  | 4.6 a           | 14.7 a                                | 17.3 a                                | 52.8 bc                          |
|                             | 33                      | 358.8 a                  | 2.9 b           | 15.4 a                                | 18.2 a                                | 67.4 a                           |
|                             | 37                      | 293.5 a                  | 2.7 b           | 15.4 a                                | 18.1 a                                | 64.5 ab                          |
| Autumn                      | 28                      | 374.1 a                  | 2.9 bc          | 13.6 a                                | 15.7 a                                | 65.5 a                           |
|                             | 30                      | 417.2 a                  | 3.3 ab          | 13.9 a                                | 16.6 a                                | 67.3 a                           |
|                             | 33                      | 458.6 a                  | 2.5 c           | 14.3 a                                | 17.4 a                                | 69.7 a                           |
|                             | 37                      | 464.3 a                  | 3.9 a           | 14.4 a                                | 16.1 a                                | 62.8 a                           |

<sup>1,2</sup> 同表一。

表 6. 澎湖地區不同採收天數對白色紙袋套袋之紅龍果著色之影響

Table 6. The influence of harvest day after bloom with white-paper fabric bag on peel color of pitaya in Penghu.

| Harvest season <sup>2</sup> | Harvest day after bloom | Shading side         |         |        | Exposed side |          |         |
|-----------------------------|-------------------------|----------------------|---------|--------|--------------|----------|---------|
|                             |                         | L* <sup>3</sup>      | a*      | b*     | L*           | a*       | b*      |
| Summer                      | 28                      | 39.22 a <sup>1</sup> | 23.92 a | 8.60 a | 34.50 bc     | 12.39 a  | 11.96 a |
|                             | 30                      | 40.38 a              | 28.12 a | 8.29 a | 32.63 bc     | 15.84 a  | 9.77 a  |
|                             | 33                      | 42.25 a              | 32.87 a | 5.40 a | 39.84 a      | 20.19 a  | 10.49 a |
|                             | 37                      | 40.99 a              | 31.18 a | 7.16 a | 38.14 ab     | 18.78 a  | 12.12 a |
| Autumn                      | 28                      | 43.43 a              | 31.87 a | 7.13 a | 36.65 a      | 22.49 b  | 9.67 a  |
|                             | 30                      | 37.76 a              | 22.04 a | 8.98 a | 42.73 a      | 32.02 a  | 6.40 b  |
|                             | 33                      | 43.23 a              | 31.11 a | 5.98 a | 39.99 a      | 21.49 bc | 11.22 a |
|                             | 37                      | 41.62 a              | 28.29 a | 5.09 a | 37.57 a      | 15.23 c  | 11.64 a |

<sup>1,2</sup> 同表一，<sup>3</sup> 同表二。



圖 1. 花後不同天數採收各種套袋之果實。Dab, 花後天數；G, 灰色不織布套袋；B, 藍色不織布套袋；P, 白色紙袋(美果袋)。

Fig 1. The bagging fruit which were harvested at 28, 30 33, 37 day after bloom (dab, day after bloom; G: grey non-woven fabric bag; B: blue non-woven fabric bag; P: white-paper bag).