

녹두 수량과 Flavonoid 함량에 대한 파종기, 피복 및 토양개량제 효과

전남농업기술원 : 김동관*, 정병준, 손동모, 이야성, 최형국

Effect of Sowing Date, Mulching and Soil Conditioners on Seed Yield and Flavonoid contents of Mungbean (*Vigna radiata* L.)

JARES : Dong-Kwan Kim*, Byung-Joon Jeong, Dong-Mo Son, Ya-Seong Lee, Hyoung-Koog Choi

실험목적

녹두 유래 주요 생리활성물질함량 증진기술 개발로 부가가치향상 및 수요촉진과 저가의 수입산에 대한 경쟁력 확보

재료 및 방법

- 시험품종 : 금성, 어울, 삼강
- 실험방법
 - 파종시기 : 5월 16일, 6월 5일, 6월 24일, 7월. 14일
 - 멀칭 : Black polyethylene film (6월 5일 파종)
 - 토양개량제 : 표준시비+유박(5ton/ha), 표준시비+붕사(0.3kg/ha), 표준시비+광석분말(1.2ton/ha), 표준시비+석회(1.5ton/ha), 표준시비 (6월 5일 파종)
 - Flavonoid 분석방법 (Kim 등, 2005)
 - 추출조건 : 70% Ethanol 80℃/90min
 - High-performance liquid chromatography(HPLC) 조건

| Flavonoid | Retention time | Condition |
|------------|----------------|---|
| Vitexin | 6.8min | Mobile phase : A(H ₂ O:EtOAc=92:8) : B(MeOH) = 85:15 Flow rate : 1ml/min Detector : Photo diode array 254nm Column : SunFire C18 5 μ m, 4.6×150mm Oven temp. : 40℃ |
| Isovitexin | 5.8min | " |

Used equipment : Chromatography used a Waters 2695 Alliance system, Waters 2996 photodiode array detector, and Empower software.

실험결과

- 녹두 수량과 비텍신, 이소비텍신 증진 측면에서의 파종적기는 6월 하순으로 판단됨
- 녹두 black polyethylene film 멀칭재배가 무멀칭보다 22% 증수되나 비텍신과 이소비텍신 함량에는 영향을 주지 않음
- 토양개량제중 유박이 녹두 수량과 비텍신과 이소비텍신 함량에 매우 좋음

연락처 : 김동관 E-mail : dkkim@jares.go.kr 전화 : 061-330-2664

Table 1. Agronomic characteristics by sowing date in Mungbean.

| Sowing date | 1st flowering date | 1st maturing date | Plant height (cm) | No. of branch per plant | Pod length (cm) | No. of pods per plant | 1,000-seed weight (g) | Seed yield (ton/ha) | Yield index |
|-------------|--------------------|-------------------|-------------------|-------------------------|-----------------|-----------------------|-----------------------|---------------------|-------------|
| May 16 | June 29 | July 21 | 67 | 2.7 | 9.9 | 20.7 | 53 | 1.74 | 100 |
| June 5 | July 17 | Aug. 3 | 72 | 0.7 | 8.4 | 20.5 | 51 | 2.18 | 125 |
| June 24 | Aug. 1 | Aug. 18 | 89 | 0.5 | 8.7 | 21.8 | 49 | 2.38 | 137 |
| July 14 | Aug. 17 | Sep. 5 | 90 | 0.4 | 8.4 | 13.7 | 55 | 1.74 | 100 |

Table 2. Vitexin and isovitexin contents by sowing date in Mungbean.

| Sowing date | Vitexin (mg/g) | | | Isovitexin (mg/g) | | |
|-------------|----------------------|--------|--------|-------------------|--------|--------|
| | 1st HT ¹⁾ | 2nd HT | 3rd HT | 1st HT | 2nd HT | 3rd HT |
| May 16 | 10.9 | 15.9 | 12.7 | 10.1 | 16.2 | 12.6 |
| June 5 | 9.9 | 11.2 | 8.6 | 10.2 | 11.0 | 8.9 |
| June 24 | 10.1 | 16.0 | 10.5 | 10.0 | 16.1 | 10.7 |
| July 14 | 9.8 | 14.4 | - | 10.0 | 13.0 | - |

¹⁾HT : Harvesting time.

Table 3. Agronomic characteristics and vitexin, isovitexin contents by black polyethylene film mulching in Mungbean.

| Treatment | Plant height (cm) | No. of pods per plant | 1,000-seed weight (g) | Seed yield (ton/ha) | Vitexin (mg/g) | | | Isovitexin (mg/g) | | |
|--------------|-------------------|-----------------------|-----------------------|---------------------|----------------------|--------|--------|-------------------|--------|--------|
| | | | | | 1st HT ¹⁾ | 2nd HT | 3rd HT | 1st HT | 2nd HT | 3rd HT |
| Mulching | 73 | 17.1 | 51 | 2.55 | 13.9 | 9.4 | 10.2 | 13.8 | 9.2 | 10.6 |
| Non-mulching | 69 | 15.7 | 50 | 2.09 | 13.1 | 9.1 | 11.9 | 13.2 | 9.1 | 12.2 |

¹⁾HT : Harvesting time.

Table 4. Agronomic characteristics and vitexin, isovitexin contents by soil conditioners in Mungbean.

| Treatment | Plant height (cm) | No. of branch per plant | No. of pods per plant | Seed yield (ton/ha) | Vitexin (mg/g) | | Isovitexin (mg/g) | |
|-----------------------|-------------------|-------------------------|-----------------------|---------------------|----------------------|--------|-------------------|--------|
| | | | | | 1st HT ¹⁾ | 2nd HT | 1st HT | 2nd HT |
| 3E ²⁾ | 51 | 0.6 | 16.0 | 1.54 | 13.1 | 8.6 | 11.8 | 10.3 |
| MOC ³⁾ +3E | 54 | 1.3 | 21.5 | 1.74 | 15.3 | 11.3 | 13.7 | 11.6 |
| Lime+3E | 53 | 0.7 | 17.3 | 1.62 | 13.3 | 11.3 | 12.6 | 11.4 |
| Borax+3E | 54 | 0.7 | 17.3 | 1.61 | 13.3 | 9.4 | 12.8 | 10.9 |
| GO ⁴⁾ +3E | 53 | 0.9 | 18.4 | 1.67 | 15.6 | 11.1 | 14.8 | 12.2 |

¹⁾HT : Harvesting time, ²⁾3E : 3 element(N, P, K), ³⁾MOC : Mixes oil cakes. ⁴⁾GO : Ground ore.