

## 十字花科 作物種子 選別을 위한 Sinapine 吸着 種子코팅법 開發

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Seed Coating System to Upgrade Brassicaceae Seed Quality by Exploiting Sinapine Leakage

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### (실험목적)

십자화과 작물종자에서 퇴화된 종자와 건전한 종자를 쉽고 효과적으로 선별하기 위하여 퇴화된 종자에서 누출되는 Sinapine 을 흡착할 수 있는 종자코팅법 개발

### (재료 및 방법)

6종의 십자화과 작물종자를 공시하여 인위적으로 퇴화 종자를 만든후 퇴화 종자와 건전종자의 Sinapine 누출을 조사하였다. 누출된 Sinapine 을 쉽게 검정하기 위하여 종자에 Cellulose 분말을 코팅하여 누출된 Sinapine 이 흡착되도록 하였으며 따라서 UV 광 하에서 형광종자와 무형광종자를 선별하였다. 선별된 종자를 온실에서 파종하여 발아 및 생육을 조사하였다.

### (실험결과 및 고찰)

1. 수분흡수 양상은 모든품종 공히 4-6시간 후에 최대 흡수상태를 나타내었고 퇴화종자와 건전종자가 비슷한 양상이었다.

2. 최대흡수 상태가 되었을 때부터 Sinapine 이 누출되기 시작하였다.

3. 4시간 수분흡수후 Sinapine 누출은 퇴화종자에서 42 - 300 % 까지 건전종자 보다 높았다.

4. Sinapine 을 검정하기 위한 종자 코팅방법은 -- 물에 종자침지(4시간)--> Cellulose 분말로 코팅-->건조(상온)--> UV 광 하에서 형광종자와 무형광종자 선별-->로 쉽게 구별 되었다.

5. 형광종자를 파종한 결과 대부분 발아하지 않거나 비정상적인 유묘가 출현되었으며 무형광종자에서는 발아율이 높음은 물론 대부분 건전한 유묘가 출현 되었다.

Table 1 Six seedlots studied on sinapine leakage

Genus Species	Crop	Cultivar	Seed Source
<i>B. napus</i> var. <i>maritima</i>	Cabbage	Danish Ballhead	Harris-Moran
<i>B. napus</i> var. <i>capitata</i>	Cabbage	King Cole	Ferry-Morse
<i>B. napus</i> var. <i>botrytis</i>	Cauliflower	Snowball	Harris-Moran
<i>B. napus</i> var. <i>italica</i>	Broccoli	Citation	Harris-Moran
<i>B. napus</i>	Canola	Westar	Agro-King
<i>Ervum hirsutifolium</i>	Wallflower	Orange Bodder	Harris-Moran

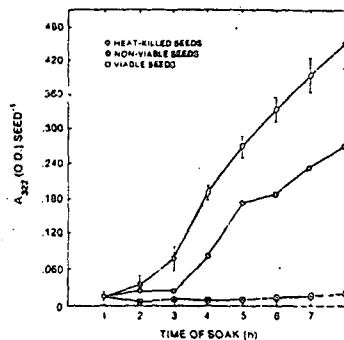


Table 2. The germination of non-deteriorated and deteriorated seeds from different seedlots.

Cultivar	Percentage					
	Non-deteriorated			Deteriorated*		
	Normal	Abnormal	Dead	Normal	Abnormal	Dead
Danish Ballhead	74	17	9	0	0	100
King Cole	95	2	3	3	27	70
Snowball	98	1	1	4	8	88
Citation	94	5	1	47	21	32
Westar	76	5	21	0	3	97
Orange Bodder	79	5	16	0	0	100

\* Seeds were incubated for 48hrs at 4°C with 20% moisture content.

Table 3. The comparison of total normal (normal + weak normal) seedlings of non-coated seeds with coated and non-fluorescent seeds from 6 seedlots.

Cultivar	Total normal seedlings (%)		
	Non-coated	Coated non-sorted	Coated non-FL
Danish Ballhead	73 c	84 b	94 a
King Cole	89 b	94 a	96 a
Snowball	89 b	86 b	95 a
Citation	88 b	87 b	96 a
Westar	60 b	58 b	83 a
Orange Bodder	68 b	55 b	87 a

y = non-FL = Non-fluorescent

z Mean separation: within rows by LSD (5%).

Table 3. The percentage of seeds exhibiting fluorescence from different seedlots and hydration treatments. The means plus standard errors are presented.

Cultivar	Fluorescence (%)	
	Inhibited	Primed
Danish Ballhead	11.0 ± 0.1	-
King Cole	11.3 ± 0.7	10.8 ± 0.6
Snowball	2.2 ± 0.2	-
Citation	9.8 ± 0.3	5.5 ± 0.3
Westar	21.3 ± 1.1	-
Orange Bodder	32.9 ± 1.2	-

Table 4. The percent normal, weak normal and abnormal seedlings and dead seeds from non-coated, coated, non-fluorescent and fluorescent from 6 seedlots.

Danish Ballhead	Percent			
	Normal	Weak normal	Abnormal	Dead
Treatment				
Non-coated	72	21	15	12
Coated non-sorted	67	21	10	6
Coated Non-FL	83	11	4	2
Coated FL	7	3	27	69
King Cole	Percent			
	Normal	Weak normal	Abnormal	Dead
Treatment				
Non-coated	73	16	8	3
Coated non-sorted	80	14	4	2
Coated Non-FL	91	5	3	1
Coated FL	5	38	42	15
Snowball	Percent			
	Normal	Weak normal	Abnormal	Dead
Treatment				
Non-coated	72	17	9	2
Coated non-sorted	69	17	10	4
Coated Non-FL	66	9	3	2
Coated FL	1	10	39	50
Citation	Percent			
	Normal	Weak normal	Abnormal	Dead
Treatment				
Non-coated	73	15	7	4
Coated non-sorted	73	14	6	5
Coated Non-FL	90	6	4	0
Coated FL	1	15	71	33
Westar	Percent			
	Normal	Weak normal	Abnormal	Dead
Treatment				
Non-coated	49	11	9	31
Coated non-sorted	47	11	10	32
Coated Non-FL	72	11	7	10
Coated FL	4	8	4	84
Orange Bodder	Percent			
	Normal	Weak normal	Abnormal	Dead
Treatment				
Non-coated	51	17	10	22
Coated non-sorted	44	11	11	29
Coated Non-FL	70	17	11	3
Coated FL	5	14	16	64

\*Non-FL = non-fluorescent, FL = fluorescent