Quality and Storability of Peanut Seed Produced by Local Farmer in Rainfed Area

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The study on quality and storability of peanut seed produced by local farmer in rainfed area was conducted in four large-seeded peanut varieties, Kaset 1, KU 50, KK 60-3 and KKU 72-2 and medium-seeded variety, Tainan 9. Peanuts were planted in the experiment station under irrigated condition and in the farmer field under rainfed condition. Pods of the five peanut varieties were stored under ambient condition at the experiment station and farmer house for 6 months. Germination, vigor and field emergence were determined at both before storage and every 3 months through out the storage period. Results revealed that peanut seeds produced under both condition were high in quality. Field emergence were at satisfactional level after 6 months storage. Quality and storability of peanuts seeds produced in experiment station were higher than those produced in farmer field. Among the five peanut varieties Kaset 1, KKU 72-2, Tainan 9 and KU 50 were higher in seed quality and storability than KK 60-3.

Introduction

Lack of high quality peanut seeds was one of the major problems of peanut production. Approximately 90% of peanut seeds used by farmers were supplied by pedlars who bought peanuts from farmers or peanut shelling plants which were low quality especially in terms of germination and varietal purity. These problems could be solved if farmer produced and stored their own seed for the next planting. More than that, genotypic difference were found between peanut cultivars in term of seed quality and deterioration (Duangpatra *et al*., 1986). It was essential to get more information concerning seed quality and storability of peanut seeds produced by local farmer in rainfed area. The objectives of this research were to find out and compare seed quality and storability of the large-seeded peanut: Kaset 1, KU 50, KK60-3 and KKU 72-2 and the medium-seeded peanut: Tainan 9 grown under rainfed condition in farmer field and experiment station.

KASET 1 KU 50 KK 60-3 KKU 72-2 TAINAN 9

Materials and Methods

Four large-seeds peanut varieties, Kaset 1, KU 50, KK60-3 and KKU 72-2 and medium seed size variety, Tainan 9 were planted in the experiment station at Suwan Wajokkasikit Field Crops Research Station, Nakhon Ratchasima province under irrigated condition and in the farmer field in Saraburi province under rainfed condition during August-January, 2002.

Farmer Field

Experiment Station

Harvesting & Depoding

Harvesting were done at maturity which were about 120 DAP for large-seeded peanut and 100 DAP for medium-seeded peanut. A randomized complete block design with 4 replications was used. Hand harvested peanuts were sun-dried to 4-7% moisture content. Dried pods were put in the jute bags and stored under ambient condition at experiment station (25.6-27.8ºC, 67-77% RH) and farmer house (28.7-30.9ºC, 80-87% RH) for 6 months during February-July 2003. Seed moisture content, germination, and seed vigor (accelerated aging and electrical conductivity: EC) were determined at The Seed Technology Laboratory, Department of Agronomy, Faculty of Agriculture, Kasetsart University. The field emergence test was carried out at Suwan Wajokkasikit Field Crops Research Station.

Results and discussion

Peanut seeds produced from both experiment station and farmer field were high quality. They were >90% of germination and >70% of germination after accelerated aging at 42ºC-100%RH for 96 hour (Table 1). After 6 months of storage, germination, germination after accelerated aging and field emergence of those produced and stored at experiment station (Table 2) were higher than those produced and stored at farmer field (Table 3). It was also found that EC of those produced and stored at experiment station were lower than farmer environment. The EC suggested that deterioration of peanut seeds of those from farmer field were higher than the experiment station. These results proved that quality and storability of peanut seeds produced in experiment station were higher than those produced in farmer field. The effect of high relative humidity also was a cause. However, field emergence of the five varieties peanut seeds produced from both locations were still high (>70%) after 6 months storage. Among the five varieties, Kaset 1, KKU 72-2, Tainan 9 and KU 50 were higher in seed quality and storability than KK 60-3 (Table 2 and 3). Interaction was found between varieties and locations, in experiment station, Kaset 1, KU 50, KK 72-2 and Tainan 9 were higher than KK 60-3 but under farmer storage, Kaset 1, KK 72-2 and Tainan 9 were higher than KU 50 and KK 60-3.

Germination after 6 months storage at experiment station

Germination after 6 months storage at farmer field

Field emergence after 6 months storage

Conclusion

Quality and storability of peanut seed produced in experiment station were higher than those produced in farmer field under rainfed condition but peanut seed produced from both experiment station and farmer field showed high field emergence (>70%) after 6 months storage under ambient condition. Kaset 1, KKU 72-2, Tainan 9 and KU 50 were higher in seed quality and storability than KK 60-3.

Table 1. Quality of peanut seeds produced in experiment station and farmer field after 6 months storage at ambient condition.

Storage period(month)	Location	Moisture content (%)	Germination (%)	Germination after accelerated aging (%)	Electro-conductivity (us/cm/gm)	Field emergence (%)
0	Experiment station	5.27 b	96.40 a	96.30 a	13.54 b	82.70 a
	Farmer field	6.52 a	93.60 b	85.90 b	20.96 a	91.30 a
3	Experiment station	5.34 b	91.50 a	85.60 a	13.82 b	98.90 a
	Farmer field	6.15 a	91.10 a	81.40 b	17.06 a	96.30 b
6	Experiment station	5.14 b	83.10 a	66.60 a	18.43 b	94.70 a
	Farmer field	6.29 a	53.80 b	32.80 b	26.75 a	75.50 b

Within a column in each storage period, means followed by the same small letter are not significantly different at P< 0.05 by DMRT.

Table 2. Seed quality of five peanut varieties produced in experiment station and stored at ambient condition for 6 months.

Variety	Moisture content (%)	Germination (%)	Germination after accelerated aging (%)	Electro-conductivity (us/cm/gm)	Field emergence (%)
			0 month		
Kaset 1	5.10 b	96.50 a	96.50 a	14.92 b	75.50 b
KU 50	5.10 b	97.00 a	93.00 a	14.08 bc	85.50 ab
KK 60-3	5.43 a	95.00 a	97.00 a	18.00 a	81.00 ab
KKU 72-2	5.35 ab	98.00 a	96.50 a	12.47 c	79.00 b
Tainan 9	5.37 ab	95.50 a	98.50 a	8.23 d	93.50 a
			3 months		
Kaset 1	5.23 c	92.00 ab	84.00 b	12.84 a	98.50 a
KU 50	5.08 d	95.50 a	85.50 b	15.64 a	99.50 a
KK 60-3	5.52 a	84.50 b	83.00 b	19.10 a	98.00 a
KKU 72-2	5.51 a	91.00 ab	81.50 b	12.19 a	99.00 a
Tainan 9	5.34 b	95.50 a	97.00 a	9.30 a	99.50 a
			6 months		
Kaset 1	5.01 a	88.50 ab	68.50 ab	16.75 b	93.00 a
KU 50	4.94 a	84.50 ab	70.50 ab	20.86 ab	93.50 a
KK 60-3	5.33 a	67.50 c	41.50 c	24.91 a	96.00 a
KKU 72-2	5.30 a	82.00 b	62.00 bc	15.13 b	95.50 a
Tainan 9	5.12 a	93.00 a	90.50 a	14.49 b	95.50 a

Within a column in each storage period, means followed by the same small letter are not significantly different at P< 0.05 by DMRT.

Table 3. Seed quality of five peanut varieties produced in farmer field and stored at ambient condition for 6 months.

Variety	Moisture content (%)	Germination (%)	Germination after accelerated aging (%)	Electro-conductivity (us/cm/gm)	Field emergence (%)
			0 month		
Kaset 1	6.51 ab	91.50 a	78.00 a	21.71 b	77.50 a
KU 50	6.59 ab	90.50 a	80.00 a	37.86 a	78.50 a
KK 60-3	6.36 b	91.00 a	91.50 a	20.06 b	71.50 a
KKU 72-2	6.86 a	97.00 a	87.00 a	13.65 b	82.00 a
Tainan 9	6.28 b	98.00 a	93.00 a	11.54 b	97.00 a
			3 months		
Kaset 1	6.25 a	91.50 a	78.50 a	18.10 b	98.00 a
KU 50	6.12 a	89.50 a	71.00 a	26.14 a	96.50 a
KK 60-3	6.04 a	93.00 a	78.00 a	12.02 b	94.50 a
KKU 72-2	6.37 a	93.50 a	86.50 a	11.07 b	99.50 a
Tainan 9	5.99 a	88.00 a	88.00 a	17.99 b	93.00 a
			6 months		
Kaset 1	6.33 a	64.50 a	50.00 a	24.21 a	83.00 a
KU 50	6.29 a	45.00 a	18.50 c	34.08 a	72.00 a
KK 60-3	6.18 a	41.00 a	26.50 bc	23.52 a	76.50 a
KKU 72-2	6.57 a	66.00 a	43.00 ab	24.46 a	76.00 a
Tainan 9	6.10 a	52.50 a	26.00 bc	31.48 a	69.00 a

Within a column in each storage period, means followed by the same small letter are not significantly different at P< 0.05 by DMRT.

References

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