Seed Quality and Storage Potential of Five Large-Seeded Peanut Varieties

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The objective of this study was to find out the quality and storability of five large-seeded peanuts. Kaset 1, Kasetsart 50, Khon Kaen 60-3, KKU 72-1 and KKU 72-2 peanut were planted in dry and rainy season. Freshly hand harvested peanut pods were sun dried to 9% moisture content, put in the jute bags and stored at local ambient condition for nine months. Seed germination and seed vigor were tested at 0, 3, 6 and 9 months after storage. Seed quality and storage potential of Kaset 1 and Kasetsart 50 large-seeded peanuts were higher than KKU 72-1 and KKU 72-2 and Khon Kaen 60-3 was the lowest. It was also found that peanut seed quality from dry season was lower than those from rainy season planting, because of the higher relative humidity and higher temperature after harvesting during the sun drying period.

Introduction

Quality of peanut seed for planting is one of the major problem in local peanut production in Thailand. Recently, many new large-seeded peanut varieties have been recommended to the farmer. It is estimated that the demand of large-seeded peanut in local industry is more than 2,000 tons per year, but production of large-seeded peanut is very limited in some specific area. Shortage of good quality seeds of large-seeded peanut is the main problem. The objective of this study was to find out the quality and storability of five large-seeded peanuts, in order to provide information for peanut seed production especially the large-seeded peanut.

Kaset 1 | Kasetsart 50 | Khon Kaen 60-3 | KKU 72-1 | KKU 72-2

Materials and Methods

Five large-seeded peanut varieties namely Kaset 1, Kasetsart 50, Khon Kaen 60-3, KKU 72-1 and KKU 72-2 were planted in dry and rainy season at Suwan Wajokkasikit Field Crops Research Station, Kasetsart University. Freshly hand harvested peanut pods were sun dried to 9% moisture content, put in the jute bags and stored at local ambient condition for nine months. Seed germination and seed vigor as determine by accelerated aging at 42°C-100 RH for 96 hours, germination index, electrical conductivity and field emergence were tested at 0, 3, 6 and 9 months after storage. At 0 months (initial before storage), prior to the germination and vigor tests, peanut seeds were incubated in electrical hot air oven at 50 °C for 72 hours to overcoming seed dormancy.

Results and Discussion

Seed quality and storage potential of Kaset 1 and Kasetsart 50 large-seeded peanuts were higher than KKU 72-1 and KKU 72-2 and Khon Kaen 60-3 was the lowest as determine by germination and seed vigor tests (Table 1 to 5). These results confirmed that seed quality and storability of peanut were different among genotypic difference as those reported by Rao *et al.* (2002), Ketring (1992) and Duangpatra *et al.* (1986). It was also found that peanut seed quality from dry season planting was lower than those from rainy season planting, because of the higher relative humidity and higher temperature after harvesting and during the sun drying period.

Table 1. Germination (%) of five large-seeded peanuts produced in dry and rainy season after 9 months storage

Storage period (Months)	Varieties					
	Kaset 1	Kasetsart 50	Khon Kaen 60-3	KKU 72-1	KKU 72-2	Mean
			Dry season			
0	95.50	91.75	94.50	90.50	90.25	92.50
3	91.75	93.00	93.75	92.25	96.75	93.50
6	81.25 a	77.75 ab	69.75 b	68.00 b	70.25 b	73.40
9	53.00 a	41.50 ab	22.75 c	33.50 bc	51.50 a	40.45
			Rainy season			
0	95.25	93.50	88.75	91.25	89.50	91.65
3	92.25	91.00	77.00	82.75	88.00	86.20
6	94.75 ab	98.00 a	94.75 ab	95.00 ab	90.50 b	94.60
9	91.00	93.75	87.25	90.75	88.25	90.20

Within each row means followed by different small letter are significantly different at 5% level of probability

Table 2. Germination(%) after accelerated aging of five large-seeded peanuts produced in dry and rainy season after 9 months storage

Storage period (Months)	Varieties					
	Kaset 1	Kasetsart 50	Khon Kaen 60-3	KKU 72-1	KKU 72-2	Mean
			Dry season			
0	90.00	81.25	84.75	90.50	89.50	87.20
3	70.50	67.50	58.50	70.75	71.00	67.65
6	51.50 a	42.25 ab	26.50 c	29.75 bc	37.75 abc	37.55
9	22.75 a	15.50 ab	1.50 c	8.50 bc	8.25 bc	11.30
			Rainy season			
0	92.25	94.00	88.25	87.50	90.75	90.55
3	92.00	88.50	85.25	84.00	89.00	87.75
6	81.50 a	82.25 a	70.50 ab	68.00 b	80.75 a	76.60
9	61.00 a	56.00 a	37.00 b	31.50 b	43.75 b	45.85

Within each row means followed by different small letter are significantly different at 5% level of probability

Table 3. Germination index of five large-seeded peanuts produced in dry and rainy season after 9 months storage

Storage period (Months)	Varieties					
	Kaset 1	Kasetsart 50	Khon Kaen 60-3	KKU 72-1	KKU 72-2	Mean
			Dry season			
0	7.83	7.72	7.90	8.62	8.45	8.10
3	7.33	7.24	6.91	7.39	7.56	7.28
6	6.89 a	6.43 ab	5.37 c	5.76 bc	5.86 bc	6.06
9	4.70 a	3.94 ab	1.61 c	2.76 bc	4.11 ab	3.42
			Rainy season			
0	7.58	7.58	6.89	7.75	7.84	7.53
3	4.78	4.30	3.45	3.60	4.11	4.05
6	7.83 ab	8.04 a	7.30 c	7.60 abc	7.38 bc	7.63
9	6.87	7.12	6.12	6.80	6.40	6.64

Within each row means followed by different small letter are significantly different at 5% level of probability

Table 4. Electrical conductivity (uS/cm.g.) of five large-seeded peanuts produced in dry and rainy season after 9 months storage

Storage period (Months)	Varieties					
	Kaset 1	Kasetsart 50	Khon Kaen 60-3	KKU 72-1	KKU 72-2	Mean
			Dry season			
0	9.40	10.58	11.96	9.35	9.85	10.23
3	21.35	19.51	23.55	15.34	12.04	18.36
6	44.40 b	57.10 b	79.02 a	55.90 b	42.96 b	55.86
9	77.62 cd	101.98 b	131.40 a	95.23 bc	71.59 d	95.96
			Rainy season			
0	14.45	24.17	19.28	28.39	9.57	16.28
3	10.34 b	11.56 ab	17.67 a	8.37 b	7.74 b	11.14
6	15.11 a	11.99 abc	13.48 ab	9.37 bc	8.21 c	11.63
9	62.09 a	58.84 a	57.59 ab	47.56 bc	43.50 c	54.12

Within each row means followed by different small letter are significantly different at 5% level of probability

Table 5. Field emergence (%) at 21 days after planting of five large-seeded peanuts produced in dry and rainy season after 9 months storage

Storage period (Months)	Varieties					
	Kaset 1	Kasetsart 50	Khon Kaen 60-3	KKU 72-1	KKU 72-2	Mean
			Dry season			
0	80.25	81.75	76.75	87.00	79.50	81.05
3	88.00	94.75	90.25	91.00	93.25	91.45
6	79.00	67.25	73.75	76.75	80.25	74.40
9	41.75 ab	31.50 b	32.50 b	33.75 b	49.75 a	37.85
			Rainy season			
0	78.25 a	73.50 ab	73.50 ab	64.75 b	74.75 a	72.95
3	82.50	78.25	84.25	72.25	64.00	76.25
6	80.50	82.50	78.50	77.75	82.00	80.25
9	78.50	77.75	72.50	72.75	75.75	75.45

Within each row means followed by different small letter are significantly different at 5% level of probability

Conclusion

Peanut seed quality and storage potential were difference among peanut varieties. Kaset 1 and Kasetsart 50 large-seeded peanut were higher in seed quality and storability than KKU72-1, KKU72-2 and Khon Kaen 60-3 was the lowest. Peanut seed quality from dry season planting was lower than those from rainy season planting, because of the higher relative humidity and higher temperature after harvesting during the drying period.

References

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