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Postharvest Loss Assessment of Potato Genotypes under Ordinary Storage Condition in Dhading and Tanahun District of Nepal

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Abstract

This study was conducted at two different locations of Dhading and Tanahun district with the objective of assessing the postharvest losses of potato genotypes under ordinary room condition at farmer's household. Potato tubers of eight genotypes (one released variety Janakdev and other seven pipeline genotypes CIP 392025.7, CIP 392797.22, CIP 393371.159, Techno 304405.47, Techno 393371.58, Techno 304351.109 and Techno 303381.3) were stored after curing for 10 days and evaluated in Randomized Complete Block Design with three replications in each experimental site from January to May, 2021. Data were recorded in 30 days interval. Observations were recorded on average weight loss, damage by tuber moth, days to sprouting, sprout length and damage due to rotting. The results showed that at the end of the storage period, average weight loss percentage was recorded minimum in genotype Techno 304405.47 in Tanahun and CIP 392797.22 in Dhading (7.61% and 13.44% respectively). 50% sprouting was recorded late in genotype CIP 393371.159 (98.33 days and 91.67 days respectively in Tanahun and Dhading) and average sprout length was also recorded the lowest in same genotype CIP 393371.159 (1.09 cm and 2.3 cm respectively in Tanahun and Dhading). Overviewing all the parameters recorded, potato genotypes Techno 304405.47, CIP 392797.22, CIP 393371.159 were found promising for their storability in ordinary farmers' conditions at both experimental sites; which can be further recommended for release/registration process and later for commercial production in the mid-hill environment of Nepal.

Keywords: farmers, household, tubers, pipeline

Introduction

Among major food crops of the world, potato is ranked in 6th position in terms of production with approximately 370 million MT produced in 2019 where China was the major producer followed by India and Russian Federation (FAO, 2021). In Nepal, the area, production and productivity of potato was recorded 198,788 ha, 3,325,231 tons and 16.73 t/ha respectively in the year 2020/21. The production was increased by 6.2% than the previous year and it contributed 5.52% in agriculture GDP (MoALD, 2022).

In developing countries, minimum share of food losses occurs at consumer level whereas maximum losses occur during the field-to-market stages. In these countries, the major causes of higher food losses along the whole Food Supply Chain includes premature harvesting, poor storage facilities, insufficient infrastructure, lack of processing facilities and inadequate market facilities (Aulakh, Regmi, Fulton, & Alexander, 2013). Postharvest technologies cannot improve but rather can only maintain the product quality which develops during growing of the product (Tigist, Workneh, & Woldetsadik, 2013). An important issue observed in the Nepalese potato sector is the higher postharvest losses occurring at farm level (Upadhyay K. P., et al., 2020). As compared to the cereal crops and grains the moisture content of potato tuber is much higher resulting difficulty in the long term storage of this commodity. Higher water content leads to losses of around 30-40% in ordinary storage condition and 10-12% in cold storage in a period of around 7-8 months.

Potato growing farmers of Nepal, in order to fetch better price after harvest use indigenous methods of potato storage for short term such as: spreading tubers on floor, storing in bins and hanging in bamboo baskets etc.

However due to uncontrolled temperature, sprouting and weight loss occurs as the main problem in those indigenous storage (Gautam, Sharma, Khatri, Thapa, & Shrestha, 2012). Key factors affecting the storability of potato tubers includes sprouting, physical and biochemical changes within tubers, high respiration and evaporation rates (Gautam, 2016). Potato farmers lack postharvest value addition techniques and are unfamiliar with the biotic and abiotic factors responsible for postharvest losses (Upadhyay K. P., et al., 2021). Sprouting during room storage, infestation by Potato Tuber Moth (PTM) *Phthorimaea operculella* (Zeller) (Lepidoptera: Gelechiidae) in field and storage, weight loss due to respiration and evaporation and limited technical knowledge of the farmers are the possible causes of postharvest losses of potato in Nepal (NPRP, 2018). PTM alone can cause up to 100% infestation in untreated potato in local unrefrigerated stores (Aryal & Jung, IPM Tactics of Potato Tuber Moth, Phthorimaea operculella (Zeller) (Lepiodoptera: Gelechidae); Literature Study, 2015). Utilization of varieties having longer postharvest shelf-life may be one of the possible solution for minimizing the postharvest losses (Upadhyay K. P., et al., 2020). Finding and applying low cost technologies for minimizing postharvest losses at farmers' level is necessary. The present study explains how the different genotypes of potato performed in terms of their storage capabilities when stored at ordinary room condition at farmers' household without use of any chemicals and suppressants.

Materials and methods

Study area description

This study was conducted by National Potato Research Programme at two different locations representing the mid-hill environmental conditions: Dhunibesi Municipality-9, Kanakot of Dhading district and Abukhaireheni Rural municipality-1, Baradi of Tanahun district. Dhunibesi is situated at 27°25′48″ N, 85°5′24″ E with the altitude of 1452 masl. Baradi is situated at 27°56'4"N, 84°28'16"E with the altitude of 388masl which represents river basin area.

Potato genotypes used for the experiment and their arrangement

For selecting the best genotype of potato for better storage at farm/household level, farmers were participated in the experiment and the experimental setup was done at their houses in normal room condition in randomized complete block design. The experiment comprised of one reseased variety Janakdev and other remaining 7 promising genotypes of potato received from International Potato Center (CIP), Peru viz: CIP 392025.7, CIP 392797.22, CIP 393371.159, Techno 304405.47, Techno 393371.58, Techno 304351.109, Techno 303381.3. These genotypes are undergoing varietal field trials at different locations all over the country and are found promising. Detail of the varieties are presented in table 1:

Table 1. Potato genotypes used as the treatments in experiment

Genotypes	Source	Pedegree	Status	Skin color	Skin Type	Maturity	Tuber Shape	Eye depth	Yield (t/ha)
Janakdev	CIP	Atzimba x Desiree (Urgenta x Depesche)	Released	Light Red	Smooth	Late	Long	Shallow	20-25
CIP 392025.7	CIP	Linea 21 x 386614.16= (DXY.4)	Pipeline	Cream	Smooth	Medium	Long	Shallow	14-24
CIP 392797.22	CIP	387521.3 x APHRODITE	Pipeline	Dark Red	Smooth	Medium	Oval/ oblong	Shallow	18-30
CIP 393371.159	CIP	387170.16 x 389746.2	Pipeline	White with light red eye area	Smooth	Late	Oval	Shallow	12-25
Techno 304405.47	CIP	WA.018 x 676008	Pipeline	White	Smooth	Medium	Oval	Shallow	25-30
Techno 393371.58	CIP	387170.16 x 389746.2	Pipeline	White	Smooth	Medium	Oval	Deep	14-33
Techno 304351.109	CIP	CHIEFTAIN x I-1039	Pipeline	Dark Red	Smooth	Medium	Round	Medium	25-30
Techno 303381.3	CIP	C91.612 x I-1039	Pipeline	White	Smooth	Medium	Round	Deep	12-25

(CIP, 2013) (Luitel, Bhandari, & Thapa, 2020) (Giri, et al., 2021) (Thapa, Paudel, Subedi, Rana, & Poudel, 2022) (Upadhyay K. P., et al., 2021) (Gotame, Poudel, Thapa, & Neupane, 2021) (NPRP, 2022)

Potato tubers of all the genotypes were harvested in the 1st week of January, 2021 when they were mature. The tubers were cured in open shade space for 10 days immediately after harvesting then were transported to the experimental sites on the third week of January. Thirty tubers of each genotype were placed on the floor after spreading newspaper in each replication where each farmers were treated as a replica. Storage experiment were conducted for a period of 150 days. Genotypes were arranged randomly and separated with wooden stick or bricks.

Storage parameters

The temperature humidity records were taken with the digital thermohygrometer at the same time every day. Data were recorded on thirty days interval. Observations on average weight loss, infestation by tuber moth, days to sprouting, sprout length and damage due to rotting were recorded. Weight loss was calculated by deducting periodic weights of tubers from the initial weight at the time of storage and was expressed in percent using the following formula:

$$Weight\ loss\ \% = \frac{Initial\ weight\ at\ the\ time\ of\ storage - weight\ on\ the\ recorded\ date}{Initial\ weight\ at\ the\ time\ of\ storage}\ X\ 100$$

Tubers infested with PTM were recorded with the number of infested eyes in the tuber. Days to sprouting were counted when at least one sprout appeared in 50% of tubers. Sprout length was measured on last day of storage. Total sprout lengths of randomly selected 5 tubers were averaged. Number of rotted tubers was recorded at the time of each recording. Data were managed in spreadsheet and analyzed with Genstat version 18 software for windows (VSN International, 2015). Analysis of variance was used to determine statistically significant differences between means. Post hoc analysis was done by Duncan's Multiple Range Test and least significant differences were also determined.

Results

Temperature and relative humidity of the experimental sites

Temperature and relative humidity of the experimental sites were recorded using Digital Series company's digital thermohygrometer (product specification Temperature Measuring Range: 50^0C~+70^0C (-58^0F+158^0F, Temperature Measuring Accuracy: ± 1^0C (1.8^0F), Temperature Resolution: 0.1^0C (0.2^0F), Humidity Measuring Range: 10% RH-99% RH, Humidity Measuring Accuracy: ±5%RH, Humidity Resolution: 1%, Used Battery: AAA1.5V). During the experimental period, minimum temperature recorded was 12.9^0C and maximum was 30.4^0C with average relative humidity 80.36% at Baradi of Tanahun and at Kanakot of Dhading minimum and maximum temperature recorded were 9.2^0C and 28.4^0C respectively and average relative humidity was 68.36%.

Table 2. Temperature and Relative humidity of the experimental site at Tanahun

Fortnight	Temp max (^{0}C)	Temp min(^{0}C)	RH max %	RH min%
1	15.63	13.71	90.20	82.20
2	15.45	12.47	80.20	72.53
3	19.11	16.52	82.80	76.87
4	21.91	19.43	79.71	74.21
5	23.45	20.56	71.80	65.93
6	22.82	20.41	77.25	70.69
7	24.94	22.65	74.67	66.53
8	25.65	24.03	81.25	75.50
9	27.74	26.35	88.47	84.13
10	28.85	27.30	88.06	83.13

Table 3. Temperature and Relative humidity of the experimental site at Dhading

Fortnight	Temp max (^{0}C)	Temp min(^{0}C)	RH max %	RH min%
1	12.2	9.87	79.52	72.11
2	12.53	8.74	72.73	64.62
3	16.21	12.73	70.44	66.43
4	18.49	15.44	68.68	64.32
5	20.74	16.26	62.35	56.85
6	19.58	16.68	67.74	63.63
7	21.43	18.35	65.04	55.52
8	22.36	20.22	72.94	65.34
9	24.11	22.38	78.47	75.73
10	25.61	23.06	77.96	74.69

It was winter season in January during the experiment setup time and the experiment continued till summer season in May. Ideal room temperature for potato storage, should be between 42 and 50^{0}F (5.5-10^{0}C) (Upadhyay K. P., et al., 2020). The temperatures were higher and humidity was lower than the ideal requirement for potato storage.

Physiological loss in weight

Significant differences were recorded for the average weight loss between the tested varieties. The weight loss increased with the progress in storage duration. On 30 days after storage, average weight loss % between the tested genotypes was found non-sinificant at Tanahun but significant difference was observed in Dhading ranging from 1.96% to 3.9%. Pooled mean values for the average weight loss % at 30 days after storage was recorded minimum in genotype Techno 303371.58 (1.84%) which was statistically at par with CIP 392797.22 (2.12%) and Techno 304351.109 and was recorded maximum in genotype CIP 393371.159 (3.64) which was followed by Janakdev, Techno 303381.3 and CIP 392025.7 (3.24%, 2.81%, 2.65%) (Table 4).

Table 4. Performance of different potato genotypes on Average weight loss percentage at Baradi, Tanahun and Kanakot, Dhading at 30 days after storage in 2021

S.N.	Genotypes	Average weight loss % (@30 Days)		
		Tanahun	Dhading	Mean
1	Janakdev	2.69	3.79b	3.24ab
2	CIP 392025.7	2.42	2.87abc	2.65abc
3	CIP 392797.22	1.3	2.95abc	2.12c
4	CIP 393371.159	3.38	3.90a	3.64a
5	Techno 304405.47	1.77	3.11abc	2.44bc
6	Techno 393371.58	1.7	1.97c	1.84c
7	Techno 304351.109	2.43	1.96c	2.19c
8	Techno 303381.3	2.98	2.63bc	2.81abc
	LSD	**1.43**	**1.11**	**0.947**
	CV%	**35**	**21.9**	**31**
	Mean	**2.33**	**2.9**	**2.61**
	P value	**0.097**	**0.014**	**0.007**

On 90 days after storage, average weight loss % increased gradually and significant difference was observed among the tested genotypes ranging from 2.87% to 7.4% at Tanahun and 4.25% to 12.68% at Dhading. Pooled mean values for the average weight loss % at 90 days after storage was recorded minimum in genotype Techno 303371.58 (3.94%) which was statistically at par with Techno 304351.109 and CIP 392797.22 (4.13% and 4.18% respectively). Maximum weight loss was recorded in genotype CIP 393371.159 (10.04%) which was followed by Janakdev and Techno 303381.3 (7.46% and 7.33% respectively) (Table 5).

Table 5. Performance of different potato genotypes on Average weight loss percentage at Baradi, Tanahun and Kanakot, Dhading at 90 days after storage in 2021

S.N.	Genotypes	Average weight loss % (@90 Days)		
		Tanahun	Dhading	Mean
1	Janakdev	4.33b	10.59ab	7.46ab
2	CIP 392025.7	4.81b	6.43c	5.62bc
3	CIP 392797.22	2.87b	5.49c	4.18c
4	CIP 393371.159	7.40a	12.68a	10.04a
5	Techno 304405.47	3.2b	7.01bc	5.10bc
6	Techno 393371.58	3.45b	4.43c	3.94c
7	Techno 304351.109	4.02b	4.25c	4.13c
8	Techno 303381.3	7.00a	7.65bc	7.33ab
	LSD	1.89	3.74	2.85
	CV%	19.6	29.2	40.8
	Mean	4.64	7.32	5.98
	P value	<.001	0.003	<.001

On 150 days after storage, average weight loss % increased and significant difference was observed among the tested genotypes ranging from 7.61% to14.1% at Tanahun and 13.82% to 32.02% at Dhading. Pooled mean values for the average weight loss % at 150 days after storage was recorded minimum in genotype Techno 304405.47 (10.72%) which was statistically at par with CIP 392797.22 (10.93%) similarly maximum weight loss % was recorded in genotype CIP 393371.159 (23.06%) which was followed by Techno 303381.3 (19.52%) and CIP 392025.7 (16.81%) (Table 6).

Table 6. Performance of different potato genotypes on Average weight loss percentage at Baradi, Tanahun and Kanakot, Dhading at the end (150 days) of storage in 2021

S.N.	Genotypes	Average weight loss % (@150 Days)		
		Tanahun	Dhading	Mean
1	Janakdev	9.74bc	19.21c	14.47bc
2	CIP 392025.7	10.99b	22.63bc	16.81abc
3	CIP 392797.22	8.42c	13.44d	10.93c
4	CIP 393371.159	14.1a	32.02a	23.06a
5	Techno 304405.47	7.61c	13.82d	10.72c
6	Techno 393371.58	8.73bc	17.81cd	13.27bc
7	Techno 304351.109	9.01bc	18.98c	13.99bc
8	Techno 303381.3	13.29a	25.74b	19.52ab
	LSD	**2.099**	**4.79**	**7.48**
	CV%	**11.7**	**13.4**	**41.7**
	Mean	**10.23**	**20.46**	**15.35**
	P value	**<.001**	**<.001**	**0.024**

Days to 50% sprouting

The tested varieties showed significant differences for the days to 50% sprouting. Days to 50% sprouting ranged from 69.33 days to 91.67 days at Dhading and 73.33 days to 98.33 days at Tanahun. In both the locations, genotype CIP 393371.159 recorded later days to 50% sprouting and genotype CIP 392797.22 in Dhading and Techno 304351.109 in Tanahun recorded earlier days to 50% sprouting.Pooled mean values for the days to 50% sprouting was recorded minimum in genotype Techno 304351.109 (73.33 days) which was followed by genotype CIP 392797.22 (76 days) and was maximum of genotype CIP 393371.159 (95 days) which was statistically at par with Techno 304405.47 (92.5 days), Techno 393371.58 (87.67 days), CIP 392025.7 (87.67 days) and Janakdev (87.17 days) (Table 7).

Table 7. Days to 50% sprouting of different potato genotypes stored in ordinary room condition at Baradi, Tanahun and Kanakot, Dhading in 2021

S.N.	Genotypes	Days to 50% sprouting		
		Dhading	Tanahun	Mean
1	Janakdev	81abc	93.33ab	87.17a
2	CIP 392025.7	90a	85.33abc	87.67a
3	CIP 392797.22	69.33c	82.67bc	76bc
4	CIP 393371.159	91.67a	98.33a	95a
5	Techno 304405.47	90a	95ab	92.5a
6	Techno 393371.58	86.67ab	88.67ab	87.67a
7	Techno 304351.109	73.33bc	73.33c	73.33c
8	Techno 303381.3	80abc	91.67ab	85.83ab
	LSD	**14.87**	**12.85**	**9.9**
	CV%	**10.3**	**8.3**	**9.9**
	Mean	**82.8**	**88.5**	**85.6**
	P value	**0.045**	**0.021**	**<.001**

Sprout length

Significant differences were observed between the tested varieties for their average sprout length. The average sprout length ranged from 1.09 to 5.05 cm at Tanahun and 2.3 to 5.57 at Dhading at the end of storage period on 150 days. In both the locations, genotype CIP 393371.159 recorded the minimum sprout length (1.09 cm and 2.3 cm at Tanahun and Dhading respectively). Similarly, genotype Techno 304351.109 recorded the maximum sprout length in both experimental sites (5.05 cm and 5.57 cm at Tanahun and Dhading respectively). Pooled mean values of average sprout length was minimum of genotype CIP 393371.159 (1.7 cm) which was statistically at par with genotype Techno 304405.47 (2.33 cm) and was maximum of genotype Techno 304351.109 (5.31cm) which was followed by genotype CIP 392797.22 (4.19 cm) (Table 8).

Table 8. Average sprout length of different potato genotypes stored in ordinary room condition at the end of storage period at Baradi, Tanahun and Kanakot, Dhading in 2021

S.N.	Genotypes	Average sprout length (cm)		
		Tanahun	Dhading	Mean
1	Janakdev	1.97bc	3.08b	2.52bc
2	CIP 392025.7	2.59b	2.80b	2.69bc
3	CIP 392797.22	2.69b	5.68a	4.19ab
4	CIP 393371.159	1.09c	2.30b	1.7c
5	Techno 304405.47	1.78bc	2.89b	2.33c
6	Techno 393371.58	2.34b	3.07b	2.71bc
7	Techno 304351.109	5.05a	5.57a	5.31a
8	Techno 303381.3	2.11bc	3.2b	2.65bc
	LSD	**1.075**	**1.62**	**1.57**
	CV%	**25**	**25.8**	**44.6**
	Mean	**2.45**	**3.57**	**3.01**
	P value	**<.001**	**0.002**	**0.001**

Damage by PTM

Number of tubers infested by PTM were significantly different between the tested varieties at Tanahun but were found non-significant at Dhading. The average number of tubers infested by PTM ranged from 16.67 to 25 at Tanahun and 14.33 to 20.33 at Dhading at the end of storage period. In both the locations, genotype Techno 393371.58 recorded the maximum number of tubers infested (25 and 21 at Tanahun and Dhading respectively). Pooled mean values was found minimum of genotype CIP 393371.159 (1.7 cm) which was statistically at par with

genotype Techno 304405.47 (15.17) and was maximum of genotype Techno 393371.58 (23) which was followed by genotype Techno 303381.3 (20.67), CIP 393371.159 (20) and Janakdev (19.33) (Table 9).

Table 9. Average number of tubers infested by PTM stored in ordinary room condition at the end of storage period at Baradi, Tanahun and Kanakot, Dhading in 2021

S.N.	Genotypes	No. of tubers infested by PTM		
		Tanahun	Dhading	Mean
1	Janakdev	22.67ab	16	19.33abc
2	CIP 392025.7	18.33c	17.33	17.83bcd
3	CIP 392797.22	17.33c	14.33	15.83cd
4	CIP 393371.159	19.67bc	20.33	20ab
5	Techno 304405.47	16.67c	13.67	15.17d
6	Techno 393371.58	25a	21	23a
7	Techno 304351.109	17.67c	16.33	17bcd
8	Techno 303381.3	22.67ab	18.67	20.67ab
	LSD	**3.8**	**4.9**	**3.43**
	CV%	**10.8**	**16.2**	**15.8**
	Mean	**20**	**17.21**	**18.6**
	P value	**0.002**	**0.054**	**<.001**

Loss due to rotting

During the experimental period, no loss of tubers was observed at Kanakot, Dhading due to rotting but a non-significant loss was observed at Baradi of Tanahun. One tuber each of genotypes Techno-303381.3 and Janakdev were observed rotten at Baradi. Tubers of the genotypes were free from bruising and other damages before storage. They were well dried, free of soil dust and matured with compact periderm after harvest by curing. The environment of storage room contributes to losses such as rotting. Rooms were well ventilated and there was abundant space to place the genotypes in single layer on floor which contributed to enough aeration between tubers.

Discussions

This experiment conducted to access the postharvest losses of different potato genotypes in ordinary storage condition showed highly significant differences among the stored potato genotypes which indicated the presence of genetic variation for storability. Tested genotypes differed significantly in average weight loss, infestation by tuber moth, days to sprouting and sprout length. The variation in postharvest parameters of the potato genotypes was reported by previous researchers too (Upadhyay K. P., et al., 2020) (Upadhyay K. P., et al., 2021). Selection of genotypes with better keeping quality when harvested at optimum maturity leads to attainment of better product quality (Tigist, Workneh, & Woldetsadik, 2013).

Along with the postharvest factors, the pre-harvest factors such as: growing condition, weather variation, planting time, management practices, maturity days, physiological age of tuber, tuber size, etc. affects the postharvest characteristics of genotypes (Subedi, et al., 2022). The sprouting of potato itself and intensive evaporation of water from the sprout surface causes great weight loss, which exhibits softening and shrinkage (Gautam, Sharma, Khatri, Thapa, & Shrestha, 2012). The genotype CIP 393371.159 had large sized tubers which may have aided in higher weight loss because of higher surface area available for transpiration and respiration losses.

According to various studies, varieties are characterized by different sprouting behavior which agreed to the results of this study (Upadhyay K. P., et al., 2020) (Upadhyay K. P., et al., 2021); (Mani & Hannacha, 2015). According to a review study sprouting phase is a complex process which depends mainly on the genetic background, tuber development stage, environmental and management conditions during tuber growth and storage and also on mother tuber. The environmental factors that governs tuber sprouting includes: temperature, humidity, water supply, photoperiod during plant growth, etc. (Mani & Hannacha, 2015). Techno 304351.109 was the earliest to achieve 50% tuber sprouting and due to earlier sprout initiation, the sprout length at the end of storage period was also recorded higher in this genotype.

According to (Yathom, 1986), PTM favours high temperature and drought and the variation between potato varieties in terms of the infestation may be attributed to different levels of sugar or glycoalkaloid and amino acid contents. The environmental factor may be the reason behind no infestation during earlier phases of storage and infestation seen at the later phases due to increase in temperature. Resistance of potato varieties to potato tuber moth have been studied which showed variable level of resistance among diferent varieties or genotypes to oviposition and larval damage (Aryal & Simkhada, 2020). The mechanism of resistance of varieties to potato tuber moth was most probably antibiosis (Ojero & Mueke, 1985). The glycoalkaloids, amino acids and digestible carbohydrate were not tested in the present study. Factors such as physical, nutritional, chemical or genetical which may be involved inducing resistance mechanism should also be studied and verified.

Dry rot, soft rot and other fungal diseases are the major causes of rotting in stored potatoes. Diseases mainly occurs after host-pathogen interaction is influenced by the environment on either the potato or the pathogen or on both (Masum, Islam, Islam, & Kabir, 2011). Loss due to rotting was very less. Curing done for 10 days before placing in the experimental trial may be a reason behind very minimum loss as curing aids in periderm formation and healing of the wounds. The storage rooms were well-ventilated and tubers were spread on the floor in a single layer and were free from bruising or other damages which may be the possible reason behind minimal damage due to rotting. Yield losses attributed to dry rot in storage ranged from 6 to 25% in some cases. Similarly, the average loss of potato due to bacterial soft rot was recorded at about 4.9% at farmer's level in Bangladesh (Rahman, Khan, Khan, & Rahman, 2010).

Conclusion

Seven pipeline varieties and one released variety of potato were tested under farmers ordinary room condition at two locations. Among the tested genotypes, analyzing the results of weight loss, damage by tuber moth, days to sprouting, sprout length and damage due to rotting, potato genotypes Techno 304405.47, CIP 392797.22 and CIP 393371.159 were found promising for their storability. As these genotypes are still in testing phase for their plant and yield characteristics on the research trials being conducted at different agro-ecologies, the appropriate ones found from those research trials should again be placed for storage trials at more diverse locations to confirm the results of this experiment then later they can be recommended for variety release/registration process.

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Declaration of conflict of interest

Neela Paudel actively led the activity, designed and managed the experiment and was involved in experimentation process and data recording, Kalika Prasad Upadhyay developed the project activity, Giridhari Subedi led the project as project leader, Sunil Aryal and Resona Simkhada were mainly involved in entomological scoring part and also helped in whole experimentation process and Anuja Rijal and Bihani Thapa guided the research treatments, assisted in data recording and manuscript writing.

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