BIBLIOGRAPHY

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ABSTRACT

The study was conducted at Semi-temperate Vegetable Research and Development Center (STVRDC) greenhouse at Balili, La Trinidad, Benguet from August to December 2012 to; evaluate the ability of the different potato accessions as planting material using the rapid multiplication technique (RMT); identify the best potato accession/s suited for rapid multiplication technique under organic production and determine the profitability of the different potato accessions for rooted stem cutting production.

Potato accessions 303224 and 305786 significantly produced the highest number of roots and leaves, plant survival, plant vigor and high resistance to late blight and leaf miner and highest return on cash expense.

Potato accessions 303224 and 305786 including 303203, 304416, 307251, 307521 and Tawid are recommended for stem cutting production under organic management systems.

INTRODUCTION

Potato (*Solanum tuberosum* L.) is one of the most important dicotyledonous source of human food. It is a well-known source of energy and provides negligible amount of proteins, vitamins, and minerals. It ranks as the fifth major food crop of the world, exceeded by grasses, wheat, rice, corn, and barley (Woolfe (1987).

Among the root crops in the Philippines, potato is considered as a major cash crop especially in the highlands. Benguet province is the major potato producer contributing 62% of the total volume produced in the country (BAS, 2007). Production however, is affected by many factors such as insect pest, diseases, unfavorable environmental conditions and lack of planting materials. Potatoes are traditionally grown from tubers. However, with continuous planting of the seed tubers, many problems occur. One of the problems is the occurrence of diseases such as virus which results in low quality tubers. Farmers also have low yielding seed. Due to the problem, an alternative system of producing planting materials is the rapid multiplication technique (RMT).

RMT technology can help farmers produce an adequate yield, increase the profit and increase the food production that will cope up with the increasing population of our country. In the developing countries of Asia, cuttings are used as a source of good quality planting materials and a promising tool to low-cost potato production in enabling the rapid and timely increase of new cultivars and preventing possible occurrence of diseases (Escobar and Zaag, 1985).

Furthermore, stem cutting production is an alternative way to produce clean, affordable planting materials that can produce 20-60 cuttings from each mother plant. Using stem cutting breaks the contact of tuber with soil-borne pathogens.

The lack of planting materials coupled with the use of synthetic inputs contributes to low production of potato in the highlands. One solution to this problem may be the use of RMT under organic production. Planting new varieties would be better if farmers would shift to alternative ways of production rather than the conventional way. Briones (1997) stated that organic farming practices the use of organic fertilizer and diverse cropping system, without the use of any chemical pesticides.

Organic production is long term and environmentally safe means of limiting damage from the attack of pest and diseases (Wang *et al*., 2001). An important practice in organic farming is the use of variety that performs well and resistant to pest and diseases.

It is important to use rapid multiplication technique because this technique results in the fast production of clean, affordable and low-cost planting materials for farmers. The ability of different accessions of potato produce stem cuttings should be evaluated since not all accessions root vigorously. Once a potato accession with good rooting ability is identified, then the rooted stem cuttings as planting materials can be planted under organic production.

The study aimed to

1. evaluate the ability of different potato accessions using the rapid multiplication technique (RMT);
2. identify the best potato accession/s suited for rapid multiplication technique under organic production and;
3. Determine the profitability of the different potato accessions for rooted stem cutting production.

The study was conducted at Semi-temperate Vegetable Research and Development Center (STVRDC) greenhouse at the Benguet State University (BSU) experimental station, Balili, La Trinidad, Benguet from August 2012 to December 2012.

REVIEW OF LITERATURE

The Use of Rapid Multiplication Technique (RMT)

According to Escobar and Zaag (1985) the use of cuttings in developing countries like Asia is a very promising tool for low-cost production enabling the rapid and timely increase of new cultivar and preventing possible occurrence of tuber-borne diseases.

The use of stem cutting as a planting material, as an alternative to seed tubers can reduce the cost of seeds by as much as 40% (NPRCRTC, 1996). Furthermore, Dalang *et al*., (1986) reported that investment can be reduced to one half by using a cheaper alternative way of producing clean planting material like stem cutting.

Stem cutting technique requires planting tubers which serves as a mother plant. Tuber brachlets, usually cut from 2-3 inches long, permit the production of strong roof system 15 days after cutting. One mother plant gives 20-60 additional plants from each of which more branches can be excised. This technique also requires great labor and takes a long time before the desired tubers are obtained (Carpio, 1982). Dalang *et al*., (1986) stated that a mother plant can produce 20-100 stem cuttings and having 1/2 to 1 kg tubers per plant.

According to Marcelo (2005) 703309, 720071, IP84007.67, Igorota, Alpha, Astra and FJ1 were the best for rooted stem cutting production in La Trinidad. More stems cutting can be produced at 60 days after planting.

The technique such as single node and sprout cutting and leaf bud cutting have been developed for the use in screening germplasm, disease elimination, and seed program. These techniques have been adopted for rapid production using local materials available in developing countries in need innovative techniques to shorten the multiplication cycle.

RMT combines the use of sprout, single-node and stem cuttings to produce large number of cuttings transplanted to the field for further multiplication (CIP, 1984).

Organic Production

Organic production is a holistic system that aims to increase the productivity and fitness of diverse communities within the agro-ecosystem, including soil organism, plant livestock and people.

Organic farming conserves and maintains the ecological balance of the environment. It avoids the contamination of the air, soil, water and the crop itself. Organic farming preserves and enhances top soil and it increases the chances that future generation can continue growing food (Balfour, 2000).

According to PCARRD (2000) organic farming is used on farm manures in crop production which includes incorporation of crop residues, animal manures, green manures, or compost. Organic fertilizers generally provide many advantages to organic growers, to soil properties and to crop yields. An organic fertilizer provides some essential elements for proper plant growth. It assures farmers of lower stable fertilizer cost and reliable local raw materials.

Evaluation of Potato Accessions under Organic Production

According to Lem-ew (2007) among the potato entries evaluated in La Trinidad, 96-06, 13.1.1, and 5.19.2.2 are recommended for profitable production of organic potato. In Buguias, potato entries MLUSA 5 and MLUSA 8 produced the highest marketable tubers and were resistant to late blight under organic production (Sawac, 2010). In another study

on tuberlet production, potato accessions 380679.3, 8.20.41, and P3 performed the best (Loque, 2007).

Montes (2006) found that potato genotypes IP 84007.67, 676089 and Ganza had high yield and were resistant to late blight in La Trinidad. Likewise, Delfin (2012) found that potato progenies 306522, 307249, 307251, 307256, 307258 were potential accessions for organic production in the same locality.

MATERIALS AND METHODS

Preparation of Potting Media

The soil that was used as a potting media was collected from the mountain in Atok, Benguet. Soil was sieved to remove stones and big particles. The soil was mixed with vermicast compost with a ratio of 3:1 using a pail (16 liters) as a measuring tool. Three pails of soil were mixed with 1 pail of vermicast. After mixing, the substrate was placed in the each pot measuring 7" x 11".

Growing of Mother Plants

Mother plants were from the stem cutting mother plants, tubers or sprouts. Cutting of the sprouts and tubers as mother plants was done using Lysol (1 tbsp/li of water) as disinfectant. After cutting each accession, blades were dipped in Lysol.

Rapid Multiplication Technique

There were 120 stem cuttings per accession, thus a total of 30 per replication. After 2-3 weeks, first cutting was done. Like the cutting of the mother plants, blades were dipped in Lysol before and after cutting every accession. Stem cuttings were planted in seed trays with 104 hills. Mist irrigation was done once a day for at least five days a week.

Potato accessions and their sources:

Accession	Source
303203	CIP, Peru
303223	CIP, Peru
303224	CIP, Peru
303405	NPRCRTC
304416	CIP, Peru
305180	CIP, Peru
305786	CIP, Peru
306468	CIP, Peru
306521	CIP, Peru
306522	CIP, Peru
307251	CIP, Peru
307521	CIP, Peru
Tawid	NPRCRTC
Watwat	NPRCRTC
Granola Selection	Mankayan, Benguet

Experimental Design

The study was laid out using Complete Randomized Design (CRD) with four replications inside the greenhouse.

Stem Cutting Production (NPRCRTC, 1998)

Materials in disinfecting. Sanitation was done to prevent the spread of diseases and viruses. The other materials such as plastic trays were dipped in disinfecting solutions. Knives/blades were dipped in a disinfecting solution (Lysol at 1 tbsp/li of water or 10% sodium hypochlorite (10 ml/li).

Plant parts. The apical shoots were cut when mother plants have three to four simple leaves. These shoots were cut just above the node using a sterilized sharp scalpel or blade. Blades were dipped in soap or Lysol solution before cutting the next plant. Removal of the apical shoots stimulates the growth of axillary lateral shoots. The lateral shoots are then

cut after 12 to 14 days. Harvesting of stem cutting was done continuously at weekly intervals.

The data gathered were the following:

1. Percent survival (%). This was recorded by counting the number of plants that survived expressed in percentage.

$$\% \text{ Plant Survival} = \frac{\text{Number of plants survived}}{\text{Number of plants planted}} \times 100$$

2. Plant vigor of stem cutting. This was recorded at 14, 21and 28 DAP per accession using the following scale (CIP, 2001):

Scale	Description	Reaction
1	Plants are strong with robust stem and leaves.	Highly Vigorous
2	Plants are moderately strong with robust stem and leaves are light green in color	Moderately Vigorous
3	Better than less vigorous	Vigorous
4	Plants are weak with few thin stems and leaves are pale.	Less Vigorous
5	Plants are weak with few stem and leaves are very pale.	Poor Vigorous

3. Leaf miner incidence. The appearance of pest was observed 14, 21 and 28 DAP the cuttings per accession by following the scale (CIP, 2001):

Scale	Description	Remarks
1	Less infested (1-20%)	High resistant
2	Moderately infested (21-40%)	Moderately resistant

Scale	Description	Remarks
3	41-60% of the plant per plot is infested	Susceptible
4	Severely infested (61-80%)	Moderately susceptible
5	Most serious (81-100%)	Very susceptible

4. Reaction to late blight. Ratings were done at 14, 21 and 28 DAP using CIP (Henfling, 1987) ratings as follows.

CIP Scale Value	Blight		Symptom
	Mean	Limits	
1	0		No late blight observation.
2	2.5	Traces-<5	Late blight present maximum ten lesion per plant.
3	10	5-<15	Plants look healthy but lesions are easily seen at closer distance maximum foliage are affected by or destroyed correspond to more than 20 leaflet.
4	25	15-<35	Late blight easily seen on most plants about 25% of foliage are covered with lesions.
5	50	35-<65	Plots look green, however, all plants are affected. Lower leaves are dead. About half the area is destroyed.
6	75	65-<85	Plots look green with brown flecks. About 75% of each plant is affected. Leaves of the lower half of the plants are destroyed.
7	90	85-<95	Plots neither predominantly green nor brown. Only top leaves are green. Any stems have large lesions.

CIP Scale Value	Mean	Blight Limits	Symptom
8	97.5	95-<100	Plot is brown colored. Few top leaves have some green areas most stem are lesions or are dead. All leaves have lesions or are dead.
9	100		All leaves and stem are dead.

6. Number of days from planting up to the first cutting. This was taken by counting the number of days from planting to the first cutting per accession.

7. Height (cm) of the stem cutting. Stem cuttings were measured 14, 21 and 28 days after transplanting. Plants were measured from the base up to the tip of the tallest shoot.

8. Number of leaves. This was taken by counting the number of leaves at 14, 21 and 28 days after planting of the stem cutting. Ten samples was used in the gathering the data per replication.

9. Number of roots. This was taken by counting the no. of roots of stem cutting at 14, 21 and 28 days after planting. Three samples was used in the gathering the data per replication.

10. Number and weight of tuberlets produced. This was taken by counting the number and weighing the tuberlets produced per accession.

11. Return on cash expense (ROCE). This was the actual expenses during the conduct of the study and computed using the following formula:

$$\text{ROCE} = \frac{\text{Gross income - Production cost}}{\text{Production cost}} \text{ x } 100$$

RESULTS AND DISCUSSION

Agro-Climatic Data

The temperature, light intensity, amount of rainfall and relative humidity during the conduct of the study from August 2012 to December 2012 are shown in Table 1. The temperature range during the conduct of the study is from 13.1^{o} C to 24.2^{o} C. The highest relative humidity was 91% and the lowest relative humidity is 86%, the total amount of rainfall ranges from 0.01 to 1.44. The sunshine duration was high in the month of October and low at August. Zaag *et.al* (1985) cited that the best temperature range for stem cutting production is 12 ^{o}C- 28 ^{o}C. The conditions during the study are therefore, favorable for stem cutting production.

Table 1. The temperature, light intensity, amount of rainfall and relative humidity from August 2012 to December 2012

MONTH	TEMPERATURE (^{0}C)		SUNSHINE DURATION (minutes)	RELATIVE HUMIDITY (%)	RAINFALL (mm)
	Min	Max			
August	16.6	21.9	80.5	91	66.4
September	18.5	22.5	253.6	86	144.3
October	13.1	23.7	315.5	87	0.21
November	15.2	24.2	408.6	89.5	1.41
December	14.5	24.2	377.7	89	0.01

Percent Survival

Table 2 shows the percent survival of the potato accessions taken at 14 and 21 DAP. Significant differences among the accessions were observed. Accessions Tawid, 307521, 305786, 303224, 303203, 307251, 304416 and 303405 had the highest percent survival at 14 days after planting having a means ranging from 95.83 – 100%.

Significant differences were also obtained at 21 DAP as shown in Table 2. Accessions 305786, 303224, and 304416 maintained their survival at 21 DAP with a means ranging from 96.67 to 100%. Accession 303224, 305786, 307251, 307521 and Tawid consistently had 100% survival which may indicate good performance for rooted stem cutting production.

Table 2. Percent survival of 15 potato accessions for RMT under organic production at 14 and 21 DAP

ACCESSION	PLANT SURVIVAL	
	14 DAP	21 DAP
303203	96.67^{a}	91.67^{ab}
303223	91.67^{ab}	65.83^{cde}
303224	100.00^{a}	100.00^{a}
303405	95.83^{a}	73.34^{bcd}
304416	98.33^{a}	96.67^{a}
305180	67.50^{c}	50.84^{e}
305786	100.00^{a}	100.00^{a}
306468	79.17^{bc}	77.50^{abcd}
306521	89.17^{ab}	60.83^{de}
306522	85.00^{ab}	60.00^{de}
307251	100.00^{a}	90.83^{ab}
307521	100.00^{a}	84.17^{abc}
Tawid	100.00^{a}	86.67^{abc}
Watwat	83.33^{b}	60.83^{de}
Granola Selection	91.67^{ab}	74.17^{bcd}
CV%	10.67	17.48

Means with common letter are not significantly different at 5% level by DMRT.

Vigor of Stem Cuttings

All potato accessions at 14 DAP were all highly vigorous. At 21 DAP, accessions 304416, 306468, 307251, 305786, 303203, and Watwat were highly vigorous while the rest of the accessions were moderately vigorous.

Reaction to Leaf Miner

All of the potato accessions were highly resistant to leaf miner incidence at 14, 21 and 28 DAP.

Reaction to Late Blight

All of the 15 potato accessions at 14 days after planting were highly resistant to late blight. At 21 DAP, accessions 303405, 305180 and 306468 were moderately resistant while the rest of the accessions were resistant.

At 28 DAP, potato accession 303405 was moderately resistant while accessions 303223, 304416, 306522, 307251, 303224, 305786, 303203, 307521, Watwat, Tawid, and Granola were highly resistant.

Number of Days From Planting
up to the First Cutting

All accessions were planted at the same time, however, potato accession 306522 was the latest to be cut at 40 DAP. Tawid was first cut at 30 DAP while the rest of the accessions were cut at 28 DAP. Accessions were not cut at the same time due to some factors such as different source of mother plants, lengths of sprouts and ability to grow at a desired length.

Height of Stem Cuttings

Highly significant differences were noted with regards to the height at 14, 21 and 28 DAP (Table 3 and Figure 1). Potato accession 305786 produced the tallest cuttings at 14 DAP. Potato accessions 303224 and 306468 that reached a height of 5.99 cm after 21 DAP. The shortest plants were obtained from potato accession 306521.

At 28 DAP, significant differences on the stem cutting height were observed. Potato accessions 303224 and 305786 obtained the tallest stem cutting. The shortest cuttings were obtained from 306521 with a mean of 5.30 cm. These differences may be due to the genetic characteristics of the potato accessions.

Table 3. Height of 15 potato accessions for rapid multiplication technique under organic production at 14, 21 and 28 DAP
Means with common letter are not significantly different at 5% level by DMRT.

ACCESSION	HEIGHT (cm)		
	14 DAP	21 DAP	28 DAP
303203	1.86^{bc}	3.90^{de}	9.97^{abc}
303223	1.34^{bc}	2.56^{ef}	5.62^{g}
303224	2.25^{b}	5.99^{ab}	10.66^{ab}
303405	2.15^{b}	5.32^{bc}	7.48^{ef}
304416	1.88^{b}	4.17^{cd}	6.20fg
305180	1.38^{bc}	5.78^{ab}	9.15^{bcd}
305786	3.56^{a}	6.93^{a}	10.73a
306468	1.49^{bc}	5.99^{bc}	9.22^{bcd}
306521	0.92^{c}	2.51^{f}	5.30^{g}
306522	1.78^{bc}	3.69^{def}	8.79^{cde}
307251	1.44^{bc}	5.69^{ab}	9.47^{abcd}
307521	2.16^{b}	5.90^{ab}	9.35^{abcd}
Tawid	1.61^{bc}	5.83^{ab}	9.30^{abcd}
Watwat	1.61^{bc}	5.60^{ab}	9.34^{abcd}
Granola selection	1.63^{bc}	5.32^{bc}	8.17^{de}
CV%	37.35	19.74	13.16

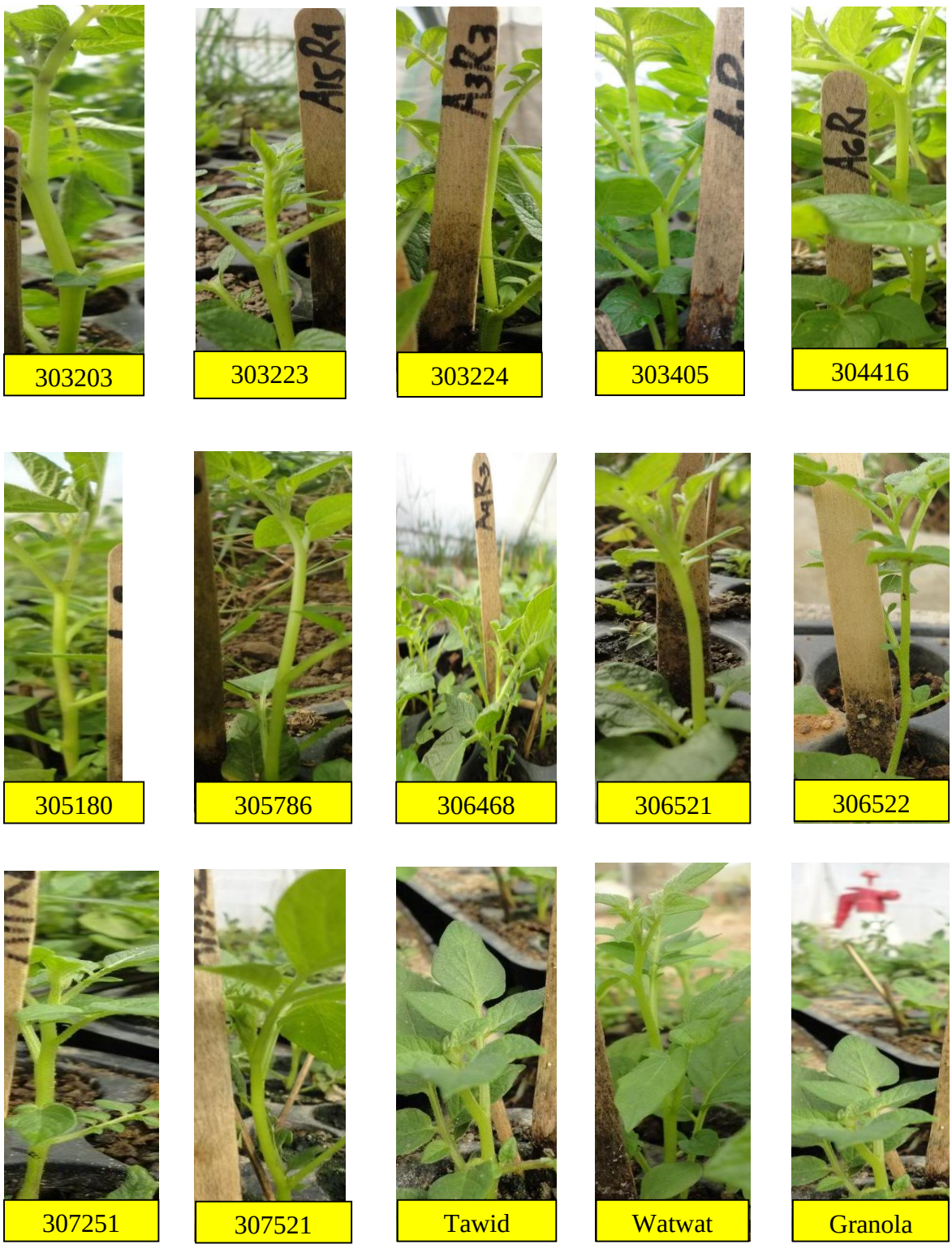

Figure 1. The 15 potato accessions at 28 DAP

Number of Leaves

The different accessions significantly differed on the number of leaves (Table 4). The highest number of leaves at 14 DAP were obtained from potato accession 303224 with a mean of 6.00. This was comparable with the leaves produced by accessions 303203, 303223, 303405, 304416, 305180, 305786, 306468, 306522, 307251, 307521, Tawid and Watwat. Other potato accessions produced few leaves at 14 DAP.

Significant differences were also obtained on the number of leaves at 21 DAP as shown in Table 4. Accessions 303224, 305786 and 306468 produced the highest numbers

Table 4. Number of leaves of 15 potato accessions for rapid multiplication technique under organic production at 14, 21 and 28 DAP

ACCESSION	NUMBER OF LEAVES		
	14 DAP	21 DAP	28 DAP
303203	5 ^{ab}	6^{ab}	8^{b}
303223	5 ^{ab}	6 ^{ab}	7^{bc}
303224	6^{a}	7^{a}	9^{a}
303405	5 ^{ab}	6 ^{ab}	7^{bc}
304416	5 ^{ab}	6 ^{ab}	7^{bc}
305180	5 ^{ab}	6 ^{ab}	7 ^{bc}
305786	5^{ab}	7^{a}	9^{a}
306468	5 ^{ab}	7^{a}	7^{bc}
306521	4^{bc}	5^{b}	7 ^{bc}
306522	5^{ab}	6 ^{ab}	7 ^{bc}
307251	5 ^{ab}	6^{ab}	7 ^{bc}
307521	5 ^{ab}	6 ^{ab}	7 ^{bc}
Tawid	5^{ab}	6 ^{ab}	7 ^{bc}
Watwat	5 ^{ab}	6^{ab}	7 ^{bc}
Granola Selection	4^{bc}	6 ^{ab}	7 ^{bc}
CV%	9.81	8.50	8.68

Means with common letter are not significantly different at 5% level by DMRT.

of leaves at 21 DAP with 7 leaves while the rest of the potato accessions produced 6 leaves. At 28 DAP, highly significant differences were noted with regards to the number of leaves as shown in Table 4. Accessions 303224 and 305786 significantly produced the highest number of leaves at 28 DAP but comparable with accession 303203 with a mean of 9 and 8, respectively, while the rest of the potato accessions produced 7 leaves. The cuttings that are tall were observed to have higher number of leaves.

Number of Roots at 14 and 21 DAP

Significant differences were noted on the number of roots at 14 DAP (Table 5). Potato accessions 303405, 305786 and 307251 significantly produced the highest number of roots at 14 DAP while the rest of the potato accessions produced roots ranging from 7 to 11.

At 21 DAP, potato accessions, 305786 and 303405 significantly produced the highest number of roots while the lowest number of roots was obtained from 303203, 305180 and 306521. Such results may be due to its varietal characteristics and few roots are caused by poor contact with the soil (Bryan, 1981).

Number and Weight of Tuberlet Produced

Only accession 307521 produced one tuberlet among the potato accessions. Tuberization occurs when the environment condition is favorable (Okozawa, 1967).

Table 5. Number of roots of 15 potato accessions for rapid multiplication technique under organic production at 14 and 21 DAP

ACCESSION	NUMBER OF ROOTS	
	14 DAP	21 DAP
303203	8[c]	18[c]
303223	9[b]	21[b]
303224	9[b]	21[b]
303405	13[a]	30[ab]
304416	9[b]	21[b]
305180	7[c]	18[c]
305786	13[a]	32[a]
306468	8[c]	21[b]
306521	8[c]	18[c]
306522	11[ab]	24[b]
307251	13[a]	28[b]
307521	8[c]	21[b]
Tawid	10[b]	25[b]
Watwat	8[c]	20[b]
Granola selection	8[c]	22[b]
CV (%)	25.16	18.55

Means with common letter are not significantly different at 5% level by DMRT.

Return on Cash Expenses (ROCE)

Table 6 shows the return on cash expense of the potato accessions evaluated and screened for rapid multiplication technique under organic production.

All potato accessions showed positive ROCE. The highest ROCE were obtained from 303224 and 305786 with 130.88% followed by 304416, 303203 and 306522 with 123.18%, 111.64% and 109.71%, respectively. The lowest ROCE was obtained from Watwat (40.45%). The positive ROCE implies that the production of these accessions is profitable for stem cutting production.

Table 6. Return on Cash Expense (ROCE) of 15 potato accessions under organic production

ACCESSION	COST OF PRODUCTION (PhP)	NUMBER OF STEM CUTTINGS	GROSS SALE (PhP)	NET INCOME (PhP)	ROCE (%)
303203	64.97	110	137.5	72.03	110.87
303223	64.97	79	98.75	33.03	50.84
303224	64.97	120	150.00	85.03	130.88
303405	64.97	88	110.00	45.03	69.31
304416	64.97	116	145.00	80.03	123.18
305180	64.97	61	76.25	11.28	17.36
305786	64.97	120	150.00	85.03	130.88
306468	64.97	94	117.50	52.53	80.85
306521	64.97	79	98.75	33.78	51.99
306522	64.97	72	90.00	25.03	38.53
307251	64.97	109	136.25	71.03	109.33
307521	64.97	101	126.25	61.03	93.94
Tawid	64.97	104	130.00	65.03	100.09
Watwat	64.97	73	91.25	26.03	40.06
Granola Selection	64.97	89	111.25	46.28	71.23

[1] price of rooted stem cutting is 1 peso/ cutting
[2] total expenses include labor, blades, Lysol, pots and pop sickle stick

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The study was conducted to: evaluate the ability of different potato accessions multiplied using the rapid multiplication technique (RMT); identify the best potato accession/s suited for rapid multiplication technique under organic production and determine the profitability of different potato accessions for rooted stem cutting. The study was conducted at the greenhouse at Balili, La Trinidad, Benguet from August 2012 to December 2012.

Among the potato accessions, 303224, 305786, 307251 and 307521 obtained the highest percent survival at 14 and 21 DAP while the lowest percent survival was recorded from 305180.

All potato accessions at 14 DAP were all highly vigorous. At 21 DAP, accessions 304416, 306468, 307251, 305786, 303203 and Watwat were highly vigorous while the rest of the accessions were moderately vigorous.

For the leaf miner incidence, all of the potato accessions were highly resistant to leaf miner infestation at 14, 21 and 28 DAP.

For late blight infection, accessions 303405, 305180 and 306468 were moderately resistant while the rest of the accessions were resistant at 21 DAP. At 28 DAP, potato accession 303405 was moderately resistant while accessions 304416, 306522, 307251, 303224, 305786, 303203, 307521, Watwat, Tawid, Granola and 303223 were highly resistant.

All accessions were planted at the same time, however, potato accession 306522 was the latest to be cut at 40 DAP. Tawid was first cut at 30 DAP while the rest of the accessions were cut at 28 DAP.

Potato accession 305786 significantly produced the tallest cuttings at 14 DAP and accessions 303224 and 306468 at 21 DAP. The shortest plants were obtained from potato accession 306521. At 28 DAP, potato accessions 303224 and 305786 obtained the tallest plants while the shortest cuttings were obtained from 306521.

Significantly differences were observed on the number of leaves at 14, 21 and 28 DAP. Potato accession 303224 produced the highest number of leaves at 14, 21 and 28 DAP.

For the number of roots, potato accessions 303405, 305786 and 307251 significantly produced the highest number of roots at 14 DAP while the rest of the potato accessions produced roots ranging from 7 to 11. At 21 DAP, potato accessions 305786 and 303405 produced the highest number of roots while the lowest number of roots were obtained from 303203, 305180 and 306521. Among the potato accessions, 307521 was the only one that produced one tuberlet.

All potato accessions showed positive ROCE. The highest ROCE were obtained from 303224 and 305786 with 130.88% followed by 304416, 303203 and 306522 with 123.18%, 111.64% and 109.71%, respectively. The lowest ROCE was obtained by Watwat (40.45%).

Conclusions

Based on the evaluation and screening of the 15 potato accessions, 305786 and 303224 are the best for rooted stem cutting production based on the plant survival, late blight resistance, height, number of leaves and roots and leaf miner resistance.

The most profitable for stem cutting production are the potato accessions 303203, 303224, 304416, 305786, 307251, 307521 and Tawid.

Recommendations

Potato accessions 305786, 303224, 304416, 307251, 303224, 305786, 303203, 307521 and Tawid are recommended for rooted stem cutting production.

These accessions can be multiplied using rapid multiplication technique under organic production systems.

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