BIBLIOGRAPHY

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ABSTRACT

The study was conducted to evaluate the growth and yield of different potato entries, to determine the entries that are best adapted in terms of growth and yield under Sagpat, Kibungan condition and, to determine the profitability of growing potato under Sagpat, Kibungan.

Potato entries CIP 380241.17, PHIL 2.21.6.2, PHIL 5.19.2.2 and CIP 676070 produced highly vigorous plants at 30 to 60 days after planting and registered the widest canopy cover at 45 to 75 days after planting. These entries also were highly resistant to late blight. All the potato entries evaluated had comparable harvest index including the check varieties Ganza, Granola and Igorota.

CIP 380241.17 produced the highest total yield, highest and heaviest super extra large tubers while PHIL 2.21.6.2 and PHIL 5.19.2.2 produced the heaviest extra big, big and super extra large tubers.

For tuber production, CIP 380241.17 produced the highest return on cash expense.

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INTRODUCTION

Potato (*Solanum tuberosum L.*) is one of the most intensively cultivated crops in the country and widely grown here in the Cordillera particularly in Benguet and Mountain Province. The production of this crop is more profitable as compared to other vegetables in the highland. Most farmers in Benguet Province are engaged in potato production not because of its adaptability to local growing conditions but also its non-perishable characteristics after harvest. It ranks first among the annually grown vegetables and one of the farmers source of income here in Benguet and some parts of Mountain Province.

Potato production in the Philippines is a highly profitable activity, producers in Benguet are among the wealthier small farmers in the country as reported by Waibel (1981). Among the BPI seed potato cooperators, it was found out that net returns for seed potato production triple those of table potatoes and are nearly ten times greater than those of cabbage or carrots.

According to the Highland Agriculture and Resources Research and Development Consortium (HARRDEC, 1996), the first decision in planting potato is to know the best variety to plant. To achieve maximum production, the best variety that is adapted to the locality must be selected, and even excellent cultural management practices will not compensate for a poor choice of variety. Using the right variety ensures high yield and better quality of produced. Inorder to determine the best suited variety, a series of varietal evaluation must be conducted to determine the performance of a previous untried variety in several locations of different elevations.

In addition, Rasco and Amante (1994) stated that the success in varietal evaluation is ultimately measured in terms of the acceptability of the variety that passed the evaluation process by the end users. A farmer may initially accept a new variety because it suits his farming practice and he finds it to be better yielding than his traditional variety but may stop growing it if the consumers and traders are not willing to buy it. Thus, the study was conducted to evaluate the growth and yield of different potato entries and determine the entries best adapted under Sagpat, Kibungan, Benguet condition and to determine the highest return on cash expense (ROCE).

The study was conducted in Sagpat, Kibungan, Benguet from July 2008 to September 2008.

REVIEW OF LITERATURE

Varietal Evaluation and Selection

Sunil (1990) stated that the first decision in planting is to know the best variety suited to the locality. Using the right variety ensures a high yield and better quality of produce. Trial planting is done to test new varieties suitable for a certain locality before planting in a wide scale. Furthermore, he reported that varietal evaluation is a process in crop breeding which provides comparison of promising cultivars developed by breeders. Through varietal evaluation, the breeder selects the best performing variety among the developed cultivars in terms of yield, quality, adaptability and resistant to pest and diseases.

Environmental Requirements of Potato Production

Simongo (2007) cited that the environment for growing potatoes markedly affects the yield. Aside from production technology, the highlands obtained high yields due to favorable temperature. Likewise, she reported that the major potato production in the Philippines is concentrated in high elevations with a temperature below 21^{o}C, which is suitable for growth and development of quality potato tubers. The potato has a wide range of soil adaptation. For optimum, yields, a deep well drained loam and sandy loam with a pH of 5.5 to 6.0 is required for potato cultivars, maximum yields are normally obtained when the average temperature through out the growing season ranges between 15-18oC. A cool night temperature appears to be more important than a cool day time temperature. High temperature during the day reduces yield (PCARRD, 1985).

According to Tad-awan, *et al*. (2008), the agro ecological zones are classified according to elevation such as: low mountain zone (1001 – 1500 masl), mid mountain zone (1501 – 2000 masl) and high mountain zone (above 2000 masl). These three agro ecological zones are all suited for potato production. Moreover, Gonzales, *et al*., (2006) reported that before a clone will be released for variety, it should be conducted in three or more locations representing the low, mid and high elevation for wet and dry in order to obtain stable growth, yield and processing qualities.

As cited by Gayao, (1989) higher yields were obtained during the dry seasons due to great solar radiation and canopy cover and lower late blight infection. Likewise, Simongo, (2007) cited that the potato grow best with temperatures ranging from 17 to 22^{o}C and with an average relative humidity requirement of 86%.

Assimilation depends on the light available and the light intercepted by the green leaves (Beukema and Vander Zaag, 1979). Furthermore, findings of Sano (1980) revealed that if large foliage developed before the tuber initiation, the ultimate potential yield will be higher. Conversely, if small foliage has developed before the tuber production, this results to lower tuber yields.

In the highlands, BSU P03 (Igorota) and BSU P04 (Solibao) are the potato varieties recommended by the Northern Philippine Root Crops Research and Training Center (NPRCRTC, 1985). Because of their yield, resistance to blight and acceptable traits, the varieties are used for potato chips and french fries.

On the average, approximately 20,000 clones are evaluated annually in various tests. From ten years of testing, several of these have shown outstanding performance (HARRDEC, 1977).

New varieties have greater yield potential than old varieties even under the best conditions. Use of fertilizers and improved farming practices will increase yield more in new varieties than in the old ones (Vergara, 1992).

Montes and Tad-awan (2006) reported that at low elevation, genotypes 676089 produced the heaviest tubers and IP84007.67, and 13.1.1 were resistant to blight at 60 and 75 DAP. Although, genotype 380251.17 produced the highest return on cash expense.

Dagdag and Tandang (2005) found that Agria and Igorota significantly produced the highest number and weight of marketable tuber per plot and total yield per hectare when planted at Abra. These varieties produced a total yield of 22.88 t/ha and 20.53 t/ha giving more than 121% and 109% return on cash expense. Raniag had the significantly highest dry matter content (DMC) of 26% which was statistically similar with Granola, Donald, Signal and Baraka with 23-25%.

Findings also showed that Igorota, Signal and Donald were the most preferred varieties by the farmers because of their good growth and yield. Farmers preferred potatoes that have uniform robust stems, good vigor and resistant to late blight, high yield and high quality that are marketable.

Gonzales *et. al.*, (2006) conducted trials across locations and different elevations in Benguet and found out that clones 13.8.1 and 13.1.1 consistently produced high yields across locations under different elevations and under dry and wet seasons. The said clones were resistant to blight and their performance was comparable to Igorota variety. Likewise, their dry matter content and chipping quality were comparable with those check varieties.

Bolislis (2005) found out that potato accession 2.21.6.1 had the highest percent survival, the most vigorous, highest canopy, highest haulm weight and produced the highest number and weight of marketable tubers in Madaymen, Kibungan.

In a study conducted by Boguiles (2002) at Bano-oy, Buguias, Benguet he found out that clone IP8400.7 produced the highest yield, significantly outyielding the check variety, Igorota. Findings indicate that clones IP84004.7 and check variety Igorota were the best performing clones in terms of yield.

MATERIALS AND METHODS

An area of 140 square meters was thoroughly prepared and divided into three blocks (Figure 1). Each block was composed of eight plots measuring 1 m x 5 m.

After land preparation one can of chicken manure per plot was applied basally. Triple 14 inorganic fertilizer as supplemental was applied during hilling-up at the recommended of 140-140-140-N-P_20_5-K_20 T/ha. One pre-sprouted potato tuberlet was planted per hill at a distance of 25 cm x 30 cm between hills and rows. All the necessary cultural practices such as weeding, pest control, irrigation and hilling-up were strictly and equally employed to all the treatments. The experiment was laid out following the Randomized Complete Block Design (RCBD) with three replications.

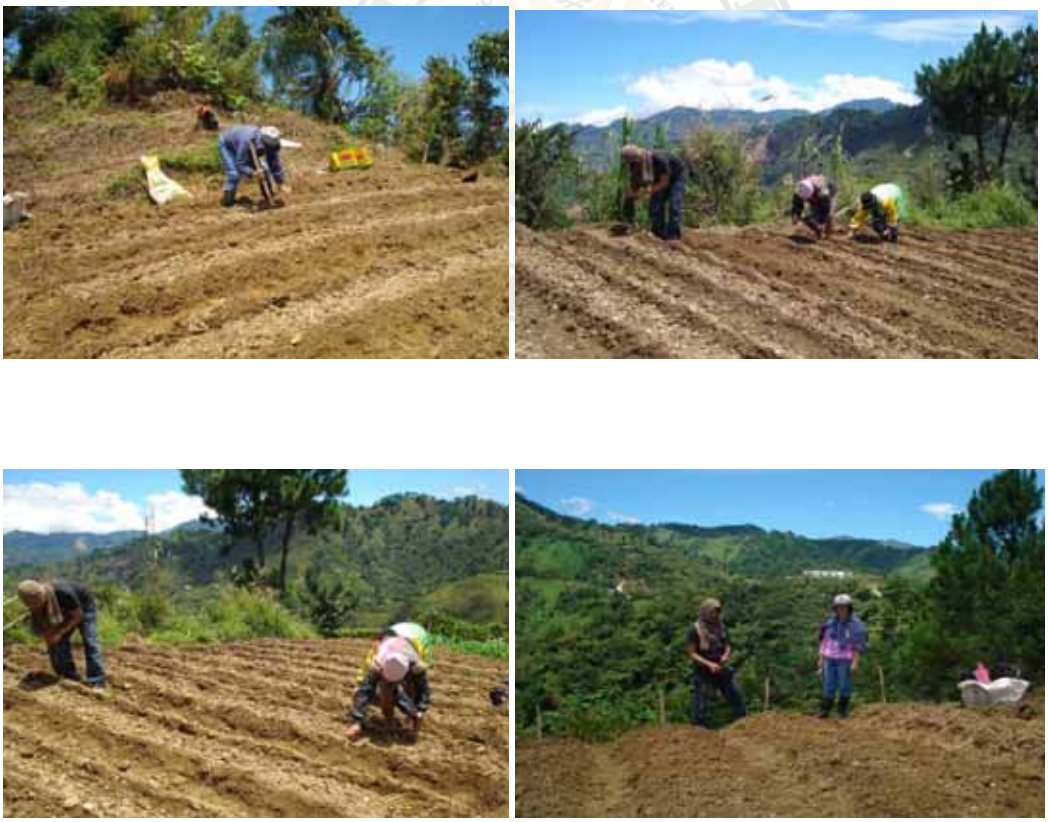

Figure 1. Land preparation and planting

The different potato entries that served as treatments were as follows:

Treatment	Entry	Source
T_1	380241.17	CIP, Peru
T_2	5.19.2.2	NPRCRTC
T_3	2.21.6.2	NPRCRTC
T_4	573275	CIP, Peru
T_5	676070	CIP, Peru
T_6	Igorota (check)	NPRCRTC
T_7	Granola (check)	CIP, Peru
T_8	Ganza (check)	CIP, Peru

Data Gathered

1. Plant survival (%). This was the number of plants that survived at 30 days after planting (DAP).

$$\% \text{ survival} = \frac{\text{Number of plants survived}}{\text{Total of number of plants planted}} \times 100$$

2. Plant vigor. This was gathered at 30, 45 and 60 DAP using CIP rating scale (CIP, 2004).

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

3. Canopy cover. This was gathered at 30, 45, 60 and 75 DAP using a wooden frame having equal sized grids of 12 x 6. Done by holding the grid over the foliage of four previously marked plants and the grids covered with effective leaves was counted.

4. Initial height (cm). This was measured using ten sample plants selected at random per plot at 30 DAP from the base to the tip of the longest shoots.

5. Final height (cm). This was measured using the ten sample plants used in getting the initial height. Plants were measured from the base up to the two of the tallest shoot one week before harvesting.

6. Reaction to leaf miner and late blight.

a. Leaf miner. The reaction to leaf miner was observed at 45, 60 and 75 DAP using the following rating scale (CIP, 2001).

Scale	Description	Reaction
1	Less than 20% of plants per plot infested	Highly resistant
2	21 – 40% of the plants per plot infested	Moderately resistant
3	41 – 60% of the plants per plot infested	Susceptible
4	61 – 80% of the plants per plot infested	Moderately susceptible
5	81 – 100% of the plants per plot infested	Very susceptible

b. Late blight. This was gathered at 45, 60 and 75 DAP using the CIP Scale (Henfling, 1982).

Blight (%)	CIP Scale	Description Symptoms
	1	No late blight observe.
Traces - <	2	Late blight present. Maximum 10 lesions per plant.
5 - < 13	3	Plants look healthy but lesions are easily seen at closer distance. Maximum foliage are affected by lesions or destroyed corresponds to no more than 20 leaflets.
15 - < 35	4	Late blight easily seen on most plants. About 25% of foliage is covered with lesions or destroyed.
35 - < 65	5	Plot look green; however, all plants are affected lower leaves are dead. About half the foliage are destroyed.
65 - < 85	6	Plot looks green with brown flecks. At about 75% of each plant is affected. Leaves of the lower-half of the plants are destroyed.
85 - < 95	7	Plot neither predominantly green nor brown. Only top leaves are green. Many stems have large lesions.
95 - < 100	8	Plot is brown colored. A few top leaves still have green areas. Most stems have lesions of are dead.
100	9	All leaves and stems dead.

Description: 1 = highly resistant; 2 – 3 = resistant; 4 – 5 = moderately resistant; 6 – 7 = moderately susceptible; 8 – 9 = susceptible

7. Yield and Yield Components.

a. Number and weight of marketable tubers per plot. All tubers free from insects and diseases damage and with less than 10% greening of total surface area was considered. The tuber was classified and weighed base on the following grades:

Size	Grams
Extra large tubers	96 g and above
Large tubers	66 to 65 g
Medium tubers	46 to 65 g
Small tubers	25 to 45 g
Marble tubers	Less than 25 g

b. Number and weight of non-marketable tubers/plot (kg). This was the tubers which are malformed, damaged by pest and diseases and marble are with 10% greening and weighing less than 20 grams was considered non-marketable. The non-marketable tubers were classified and weighed based on the following grades: XL, large, medium, and marbles.

c. Total yield per plot (kg). This was the weight of marketable and non-marketable tubers per plot.

d. Computed yield per hectare. This was computed using the formula:

$$\text{Yield (tons/ha)} = \frac{\text{Total yield/plot}}{\text{Plot size (m2)}} \times 10{,}000$$

e. Dry matter content (DMC). This was taken by slicing thinly and weighing 50 grams of tubers of assorted sizes. The samples were oven dried at 60oC for 72 hours. The dry matter was computed using the formula:

% Dry Matter Content (DMC) = 100% - % MC

Where:

$$\% \text{ Moisture Content (MC)} = \frac{\text{Fresh weight – Oven dry weight}}{\text{Fresh weight}} \times 100$$

f. Harvest index. This was obtained from the different entries using the formula:

$$\text{HI} = \frac{\text{Economic yield}}{\text{Biological yield}}$$

8. Return on Cash Expense. The cost of production, gross sales, net profit and return on cash expense was determined using the following formula:

$$\text{ROCE} = \frac{\text{Net Profit}}{\text{Total cost production}} \times 100$$

g. Cost of Production

h. Selling price

i. Gross income = total production volume x price

j. Net income = gross income – expenses

Cost and return analysis. This was obtained using the formula:

$$\text{ROCE} = \frac{\text{Gross sales – total expenses}}{\text{Total expenses}} \times 100$$

9. Meteorological Data. The temperature and relative humidity was taken using the psychrometer. Rainfall was measured by putting a pail or can in the field and measured by using graduated cylinder.

Analysis of Data

All quantitative data was analyzed using the Analysis of Variance (ANOVA) for Randomized Complete Block Design (RCBD) with three replications, the significance off

differences among the treatment means was tested using the Duncan's Multiple Range Test (DMRT).

RESULTS AND DISCUSSION

Meteorological data

Table 1 shows the meteorological data from July to September 2008 at Sagpat, Kibungan, Benguet. At the time of the study, the temperature ranged from 17 to 20 ^{0}C. The highest relative humidity was recorded in the month of July while the lowest relative humidity was recorded in the month of September with 84 and 80%, respectively. Rainfall was noted from the months of July to September and the highest was recorded in July (1.500 L) while the lowest reading was during the month of September with a rainfall amount of 1.079 Liters

Simongo (2007) cited that potato grows best with temperatures ranging from 17 to 22 ^{0}C and with an average relative humidity of 86%. Therefore, the temperature and relative humidity during the conduct of the study is favorable for potato production in Sagpat, Kibungan, Benguet.

Plant survival (%)

Percent survival of different potato entries revealed significant differences at 75 DAP. One hundred percent plant survival was obtained from entries CIP 380241.17, CIP 573275, and Granola while Igorota had the lowest percent plant survival of 61%. All the potato entries were able to withstand the erratic rainfall pattern.

Table 1. Meteorological data from July 2008 to September 2008 at Sagpat, Kibungan

MONTH	AIR TEMPERATURE (^{o}C)	RELATIVE HUMIDITY (%)	RAINFALL AMT. L
July	20	84	1.500
August	17	81	1.217
September	18	80	1.079

Table 2. Plant survival of potato the eight potato entries grown in Sagpat, Kibungan

ENTRY	PLANT SURVIVAL (%)
CIP 380241.17	100[a]
PHIL 2.21.6.2	95[ab]
PHIL 5.19.2.2	89[ab]
CIP 573275	100[a]
CIP 676070	99[a]
Igorota (check variety)	74[bc]
Ganza (check variety)	98[a]
Granola (check variety)	100[a]
CV (%)	9.95

For each column, treatment means with different letter are significantly different at 5% probability levels (DMRT)

Rating Scale:
5 = Highly vigorous 4 = Moderately vigorous 3 = Vigorous
2 = Less vigorous 1 = Poor vigor

Plant vigor

All the entries except CIP 5.19.2.2 had high vigor at 30 days after planting (DAP) which is comparable with check varieties Granola and Ganza. Most of the potato entries were highly vigorous even at 30 up to 60 days after planting.

Plant height (cm)

The potato entries showed significant differences on the initial and final plant height taken at 30 and 75 DAP (Table 3). CIP 380241.17 significantly produced the tallest plants of 35.9 cm at 30 DAP but comparable with the check variety Ganza and Granola with an initial plant height of 26.3 cm and 24.5 cm respectively.

At 75 DAP, 5.19.2.2 significantly registered the tallest plants (93.8 cm), outranking the check varieties Ganza, Igorota and Granola.

Table 3. Plant height at 30 and 75 DAP of eight the potato entries grown at Sagpat, Kibungan

ENTRY	PLANT HEIGHT	
	INITIAL (cm)	FINAL (cm)
CIP 380241.17	35.9[a]	89.2[a]
PHIL 2.21.6.2	27.2[b]	82.2[a]
PHIL 5.19.2.2	8.20[d]	93.8[a]
CIP 573275	23.8[b]	89.2[c]
CIP 676070	17.3[c]	80.6[a]
Igorota (check variety)	7.2[d]	79.7[bc]
Ganza (check variety)	26.3[b]	82.9[ab]
Granola (check variety)	24.5[b]	45.00[a]
CV (%)	17.36	11.00

For each column, treatment means with different letter are significantly different at 5% probability levels (DMRT)

It was observed that most of the potato entries are all tall at 75 DAP except for granola indicating that the entries were affected by the long photoperiods. Simongo and Gayao (2006) reported that this growth pattern in most of the entries validated the observations of some farmers that during the wet season, varieties Igorota and Raniag had tall vegetative growth and longer maturity (120 days).

Canopy Cover

Canopy cover of different potato entries shows significant differences at 30, 45, and 60 days after planting (DAP) as shown in Table 4 and Figure 2. An increasing canopy cover was noted from 30 to 75 DAP in all of the entries including the check varieties Igorota, Ganza and Granola. At 75 DAP, all the potato entries including the check varieties attained full canopy cover of 100% at 75 DAP. The high canopy cover might indicate favorable environmental condition for potato production.

Table 4. Canopy cover of the eight potato entries grown at Sagpat, Kibungan

ENTRY	CANOPY COVER (%)
	30 DAP
CIP 380241.17	62[a]
PHIL 2.21.6.2	64[a]
PHIL 5.19.2.2	31[b]
CIP 573275	65[a]
CIP 676070	36[b]
Igorota (check variety)	26[b]
Ganza (check variety)	66[a]
Granola (check variety)	77[a]
CV (%)	24.29

For each column, treatment means with different letter are significantly different at 5% probability levels (DMRT)

380241.17 573275 5.19.2.2 676070

2.21.2.6 Igorota Ganza Granola

Figure 2. The eight potato entries at vegetative stage

Reaction to Leaf Miner and Late Blight

Leaf miner incidence was not observed during the conduct of the study. In addition, the potato entries were recorded to be highly resistant to late blight at 30 to 75 DAP except for Granola variety which showed moderate resistance at 75 DAP. The occurrence of pest and disease was not observed, may be because the area planted was newly planted and surrounded with trees. Furthermore, this might be due to continuous rainfall during the conduct of study which is not favorable to leaf miner.

Number of Marketable and Non-Marketable Tubers

Table 5 shows that CIP 380241.17 produced the highest number of super extra-large tubers (130) followed by entry 676070 (102) significantly outnumbering the check varieties Granola (98), Ganza (97) and Igorota (22). However, the rest of the entries produced a super extra large size tuber, ranging from 54 to 79 outnumbering Igorota that produced 22 super xl tubers.

Significant differences were noted on the number of extra big and big tubers. PHIL 2.21.6.2 produced the highest number of extra big, big, and marble tubers. Igorota produced significantly the lowest number of tubers in all sizes.

Non-Marketable Tubers

No significant differences were observed on the number of non-marketable tubers on the different entries evaluated. The variability on the number of tubers could be associated with the genetic characteristics of the different potato entries.

Table 5. Number of marketable and non-marketable tubers of the eight potato entries grown at Sagpat, Kibungan

ENTRY	MARKETABLE				TOTAL	NON-MARKETABLE
	Super Extra-large	Extra Big	Big	Marble		
CIP 380241.17	130[a]	58[bc]	36[c]	27[b]	251	51
PHIL 2.21.6.2	54b[c]	94[a]	113[a]	88[a]	349	54
PHIL 5.19.2.2	79[ab]	45[bc]	28[c]	17[b]	169	21
CIP 573275	68[bc]	94[a]	50[bc]	46[b]	258	46
CIP 676070	102[ab]	63[b]	75[b]	38[b]	278	33
Igorota (check variety)	22[c]	29[c]	32[c]	23[b]	106	46
Ganza (check variety)	97[ab]	60[b]	47[bc]	47[b]	251	53
Granola (check variety)	98[ab]	53b[c]	47[bc]	23[b]	221	30
CV (%)	18.06	26.22	13.55	22.35	24.92	21.77

For each column, treatment means with different letter are significantly different at 5% probability levels (DMRT)

Weight of Marketable and Non-Marketable Tubers

Results showed significant differences on the marketable weight of super extra-large and extra big for the different potato entries (Table 6 and Figure 3). Entry 380241.17 produced the heaviest super xl tuber with a weight of 13.0 kg outranking the check varieties Ganza (9.90 kg), Granola (9.10 kg) and Igorota (2.38 kg). Entry 5.19.2.2 (10.30 kg) had the second heaviest harvested tubers significantly outyielding Igorota (check) (2.88 kg) but comparable with check varieties Ganza (9.90 kg) and Granola (9.10 kg).

Entry 2.21.6.2 produced the heaviest extra big tuber weight of 4.20 kg outranking the check varieties Ganza and Igorota with extra big tuber weighing 2.43 kg and 1.42 kg, respectively but comparable with Granola with extra big tuber of 3.27 kg. No significant differences were observed among the potato entries evaluated on the weight of non-marketable tubers produced.

Table 6. Weight of marketable and non-marketable tubers of the eight potato entries grown at Sagpat, Kibungan

ENTRY	MARKETABLE (15m^2)				TOTAL	NON-MARKETABLE
	Super Extra-large	Extra Large	Big	Marble		
CIP 380241.17	13.00^{a}	2.57^{abcd}	1.30	0.43	17.3	1.02
PHIL 2.21.6.2	4.54^{cd}	4.20^{a}	2.73	1.28	12.75	0.77
PHIL 5.19.2.2	10.30^{a}	1.88^{cd}	0.67	0.17	13.02	0.64
CIP 573275	5.30^{bcd}	3.63^{ab}	1.03	0.57	10.53	0.77
CIP 676070	9.37^{ab}	2.15^{bcd}	2.25	0.48	14.25	0.93
Igorota (check variety)	2.38^{d}	1.42^{d}	1.28	0.37	5.45	0.57
Ganza (check variety)	9.90^{ab}	2.43^{bcd}	1.13	0.37	13.83	2.03
Granola (check variety)	9.10^{abc}	3.27^{abc}	0.82	0.35	13.54	1.08
CV (%)	17.54	14.16	17.33	14.12	24.52	21.08

For each column, treatment means with different letter are significantly different at 5% probability levels (DMRT)

380241.17 573275 676070 2.21.2.2

573275 Ganza Igorota Granola

Figure 3. Harvested potato tubers at 90 DAP

The variation observed among the size classification of the different entries was greatly affected by the genetic characteristics associated with the environmental factors. Earlier results showed that the potato entries with good vegetative growth as to height and canopy cover had the highest number and weight of harvested tubers.

Total and Computed Yield

Table 7 showed significant differences on the total and computed yield of the eight potato entries evaluated. Potato entry 380241.17 had the highest total and computed yield of 18.32 kg per $5m^2$ and 36.64 tons per hectare significantly outyielding the check variety Igorota (12.04 Tha^{-1}), although comparable with Ganza (31.72 Tha^{-1}) and Granola (29.24 Tha^{-1}). The rest of the entries had a total yield ranging from 22.60 to 30.36 Tha^{-1} which is either comparable or outyielding the check varieties Ganza (31.72 T/ha), Granola (29.24 T/ha) and Igorota (12.04 T/ha). As an affect of the wet season planting, some of the tubers during harvesting were not fully matured thus, affecting the yield. Vander Zaag and Burton (1978) reported that in most countries with high average yield, the increases in yield during the last decades in potato were probably obtained by prolonged growth period but delayed harvesting.

Table 7. Total yield (kg) and computed yield T ha^{-1} of the eight potato entries grown at Sagpat, Kibungan

ENTRY	TOTAL YIELD (kg/5m^2)	COMPUTED YIELD (T/ha)
CIP 380241.17	18.32	36.64
PHIL 2.21.6.2	13.52	27.04
PHIL 5.19.2.2	13.66	27.32
CIP 573275	11.30	22.60
CIP 676070	15.18	30.36
Igorota (check variety)	6.02	12.54
Ganza (check variety)	15.86	31.72
Granola (check variety)	14.62	29.24
CV (%)	18.49	18.53

For each column, treatment means with different letter are significantly different at 5% probability levels (DMRT)

Harvest Index

Significant differences on the harvest index were observed among the eight potato entries as shown in Table 8. Granola (check) had the highest harvest index but comparable with CIP 573275, CIP 67670. PHIL 5.19.2.2, on the other hand, had the lowest harvest index. Low harvest indices of the potato entries evaluated is due to the high herbage yield or biological yield.

Dry Matter Content (%)

Results showed no significant differences on the dry matter content of the potato entries grown at Sagpat, Kibungan condition.

The dry matter content of the eight potato entries was not affected by the adverse climatic conditions, as the dry matter content is attributed to its genetic characteristics. Results validated the findings of Rastovski (1981) that dry matter content which is a very important factor in processing potatoes is mainly determined genetically and thus, depends on the variety.

Table 8. Harvest index and dry matter content (%) of the eight potato entries grown at Sagpat, Kibungan

ENTRY	HARVEST INDEX	DRY MATTER CONTENT
CIP 380241.17	0.77[ab]	19
PHIL 2.21.6.2	0.74[bc]	23
PHIL 5.19.2.2	0.64[c]	19
CIP 573275	0.88[a]	20
CIP 676070	0.87[ab]	19
Igorota (check variety)	0.82[ab]	21
Ganza (check variety)	0.77[ab]	20
Granola (check variety)	0.90[a]	18
CV (%)	8.78	8.24

For each column, treatment means with different letter are significantly different at 5% probability levels (DMRT)

Return on cash expenses (ROCE)

Profitability of the eight potato entries is shown in Table 9. CIP 380241.17 obtained the highest return on cash expense followed by CIP 676070 while Igorota (check) had the lowest return on cash expense. The high return on cash expense is attributed to the high yield. On the other hand, the vegetative growth of most entries may have contributed to the increase cost of production. Simongo and Gayao (2006) stated that the very tall vegetative growth of potato plants may results in enhanced stem rot and breakage and entailed higher labor and pesticide cost (Table 9).

Table 9. Cost analysis of potato production at Sagpat, Kibungan

ENTRY	COST OF PRODUCTION (Php/5m^2)	MARKETABLE TUBERS (kg/5m^2)	GROSS SALE	NET INCOME (Php)	ROCE %
CIP 380241.17	136.70	18.32	549.62	268.9	302.04
PHIL 2.21.6.2	136.70	13.53	405.6	273.1	196.70
PHIL 5.19.2.2	136.70	13.66	409.8	202.3	199.78
CIP 573275	136.70	11.30	339	318.7	147.48
CIP 676070	136.70	15.18	455.4	43	233.13
Igorota (cv)	136.70	6.02	180.6	339.1	31.45
Ganza (cv)	136.70	15.86	475.8	316.3	248.06
Granola (cv)	136.70	14.62	438.6	301.9	231.38

For each column, treatment means with different letter are significantly different at 5 % probability levels (DMRT)

= Potato tubers was sold at PhP 30.00 per kilo
= Total cost of production includes planting materials, insecticides, fertilizers and labor

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The study was conducted to evaluate the growth and yield of the different potato entries and to determine the potato entries that are best adapted in terms of growth and yield at Sagpat, Kibungan, Benguet and to determine the profitability of growing potato at Sagpat, Kibungan, Benguet. The study was conducted from July to September 2008.

Significant differences among the potato entries evaluated were noted on plant survival, vigor, height, canopy cover, number and weight of marketable tuber, total yield and harvest index.

Among the potato entries, CIP 380241.17 had a hundred percent survival, tallest initial plant height, highest and heaviest super extra large tubers, comparable harvest index, highest total and computed yield, and the highest return on cash expense.

PHIL 5.19.2.2 was the tallest at maturity, had the highest dry matter content, highest number of extra big tubers, comparable highest total and computed yield. PHIL 2.21.6.2 produced the highest number of big and marble sized potato tubers and the heaviest extra big tubers. CIP 676070 had comparable total and computed yield.

On the reaction to leaf miner and late blight, all of the potato entries evaluated showed high resistance.

As to the performance of the check varieties, comparable total yield was noted in Ganza and Granola. Igorota was the lowest yielder.

Conclusions

The best performing potato entries are CIP 380241.17, PHIL 2.21.6.2, and PHIL 5.19.2.2 and CIP 676070 based on yield and resistance to late blight.

CIP 380241.17, PHIL 2.21.6.2, PHIL 5.19.2.2 and 676070 are best adapted at Sagpat, Kibungan.

CIP 380241.17 is more profitable to grow at Sagpat, Kibungan, Benguet.

Recommendations

CIP 380241.17, PHIL 2.21.6.2, PHIL 5.19.2.2 and CIP 676070 could be recommended for potato production at Sagpat, Kibungan condition.

There should be continuous evaluation and selection of potato entries until a variety with stable performance will be recommended at Sagpat, Kibungan condition in various planting seasons.

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APPENDICES

Appendix Table 1. Plant survival

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	100	100	100	300	100
2.21.6.2	100	97	87	284	95
5.19.2.2	100	95	72	267	89
573275	100	100	100	300	100
676070	100	97	100	297	99
Igorota	100	55	67	222	74
Ganza	100	100	95	295	98
Granola	100	100	100	300	100
TOTAL	800	744	721	2265	94

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	432.083	215.042			
Treatment	7	1706.958	243.851	2.70^{ns}	2.77	4.28
Error	14	1219.917	87.137			
TOTAL	23	3356.958				

^{ns} =Not significant Coefficient of Variation (%) = 9.95

Appendix Table 2. Plant vigor at 30 DAP

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	5	5	5	15	5
2.21.6.2	5	5	4	14	5
5.19.2.2	4	3	2	9	3
573275	5	5	5	15	5
676070	5	5	5	15	5
Igorota	3	2	2	7	2
Ganza	5	5	5	15	5
Granola	5	5	4	14	5
TOTAL	37	35	32	104	4

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	1.583	0.792			
Treatment	7	23.333	3.333	19.31**	2.77	4.28
Error	14	2.417	0.173			
TOTAL	23	27.333				

** =Highly significant Coefficient of Variation (%) = 9.59

Appendix Table 3. Plant vigor at 45 DAP

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	5	5	5	15	5
2.21.6.2	5	5	5	15	5
5.19.2.2	5	5	5	15	5
573275	5	5	3	13	4
676070	5	5	5	15	5
Igorota	4	5	5	14	5
Ganza	5	5	5	15	5
Granola	5	5	5	15	5
TOTAL	39	40	38	117	5

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	0.250	0.125			
Treatment	7	1.292	0.185	0.84^{ns}	2.77	4.28
Error	14	3.083	0.220			
TOTAL	23	4.625				

^{ns} = Not significant Coefficient of Variation (%) = 9.63

Appendix Table 4. Plant vigor at 60 DAP

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	5	5	5	15	5
2.21.6.2	5	5	5	15	5
5.19.2.2	5	5	5	15	5
573275	5	5	3	13	4
676070	5	5	5	15	5
Igorota	4	5	5	14	5
Ganza	5	5	5	15	5
Granola	5	5	5	15	5
TOTAL	39	40	38	117	5

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	0.083	0.042			
Treatment	7	0.292	0.042	1.0^{ns}	2.77	4.28
Error	14	0.583	0.042			
TOTAL	23	0.958				

^{ns} = Not significant Coefficient of Variation (%) = 4.12

Appendix Table 5. Canopy cover at 30 DAP

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	85	61	39	185	62
2.21.6.2	93	61	38	192	64
5.19.2.2	47	28	19	94	31
573275	76	76	44	196	65
676070	46	27	35	108	36
Igorota	21	35	23	79	26
Ganza	90	70	39	199	66
Granola	87	73	42	202	67
TOTAL	545	431	279	1255	52

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	4452.333	2226.167			
Treatment	7	6590.958	941.565	6.93**	2.77	4.28
Error	14	1901.667	135.833			
TOTAL	23	12944.958				

** =Highly significant Coefficient of Variation (%) = 22.29

Appendix Table 6. Canopy cover 45 DAP

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	100	100	100	300	100
2.21.6.2	100	100	100	300	100
5.19.2.2	100	100	100	300	100
573275	100	100	100	300	100
676070	100	100	100	300	100
Igorota	100	100	100	300	100
Ganza	100	100	100	300	100
Granola	94	95	100	289	96
TOTAL	794	795	800	2389	100

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	2.583	1.292			
Treatment	7	35.292	5.042	3.90*	2.77	4.28
Error	14	18.083	1.292			
TOTAL	23	55.958				

* = Significant Coefficient of Variation (%) = 1.14

Appendix Table 7. Canopy cover at 60 DAP

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	100	100	100	300	100
2.21.6.2	100	100	100	300	100
5.19.2.2	100	100	100	300	100
573275	100	100	100	300	100
676070	100	100	100	300	100
Igorota	100	100	100	300	100
Ganza	100	100	100	300	100
Granola	97	98	100	295	98
TOTAL	797	798	800	2395	100

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	0.583	0.292			
Treatment	7	7.292	1.042	3.57*	2.77	4.28
Error	14	4.083	0.292			
TOTAL	23	11.958				

* = Significant Coefficient of Variation (%) = 0.54

Appendix Table 8. Canopy cover at 75 DAP

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	100	100	100	300	100
2.21.6.2	100	100	100	300	100
5.19.2.2	100	100	100	300	100
573275	100	100	100	300	100
676070	100	100	100	300	100
Igorota	100	100	100	300	100
Ganza	100	100	100	300	100
Granola	100	100	99	299	100
TOTAL	800	800	799	2399	100

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	0.083	0.042			
Treatment	7	0.292	0.042	1.0	2.77	4.28
Error	14	0.583	0.042			
TOTAL	23	0.958				

^{ns} = Not significant Coefficient of Variation (%) = 0.20

Appendix Table 9. Late blight at 30 DAP

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	1	1	1	3	1
2.21.6.2	1	1	1	3	1
5.19.2.2	1	1	1	3	1
573275	1	1	1	3	1
676070	1	1	1	3	1
Igorota	1	1	1	3	1
Ganza	1	1	1	3	1
Granola	1	1	1	3	1
TOTAL	8	8	8	24	1

Appendix Table 10. Late blight at 45 DAP

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	1	1	1	3	1
2.21.6.2	1	1	1	3	1
5.19.2.2	1	1	1	3	1
573275	1	1	1	3	1
676070	1	1	1	3	1
Igorota	1	1	1	3	1
Ganza	1	1	1	3	1
Granola	1	1	1	3	1
TOTAL	8	8	8	24	1

Appendix Table 11. Late blight at 60 DAP

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	1	1	1	3	1
2.21.6.2	1	1	1	3	1
5.19.2.2	1	1	1	3	1
573275	1	1	1	3	1
676070	1	1	1	3	1
Igorota	1	1	1	3	1
Ganza	1	1	1	3	1
Granola	1	1	1	3	1
TOTAL	8	8	8	24	1

Appendix Table 12. Late blight at 75 DAP

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	1	1	1	3	1
2.21.6.2	1	1	1	3	1
5.19.2.2	1	1	1	3	1
573275	1	1	2	4	1
676070	2	1	1	4	1
Igorota	2	1	1	4	1
Ganza	1	1	1	3	1
Granola	3	4	3	10	3
TOTAL	12	11	11	34	1

Appendix Table 13. Initial Plant height

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	29.7	27.1	16.8	73.6	24.5
2.21.6.2	32.7	23.3	25.6	81.6	27.2
5.19.2.2	12.0	8.7	3.9	24.6	8.2
573275	30.7	22.6	18.2	71.5	23.8
676070	15.8	18.0	18.0	51.8	17.3
Igorota	3.85	8.9	8.9	21.65	7.2
Ganza	30.6	24.1	24.1	78.8	26.3
Granola	38.8	34.5	34.5	107.8	35.9
TOTAL	194.15	167.2	150	511.35	21.3

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	124.319	62.159			
Treatment	7	2027.184	289.598	21.18**	2.77	4.28
Error	14	191.389	13.671			
TOTAL	23	2342.892				

** = Highly significant Coefficient of Variation (%) = 17.36

Appendix Table 14. Final Plant height

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	56.3	35.5	43.2	135.0	45.0
2.21.6.2	86.4	84.6	75.6	246.6	82.2
5.19.2.2	94.1	103.7	83.6	281.4	93.8
573275	85.5	97.3	84.8	267.6	89.2
676070	72.4	98.5	71.0	241.9	80.6
Igorota	74.7	78.0	86.3	239	79.7
Ganza	73.9	98.5	76.3	248.7	82.9
Granola	86.6	93.5	87.4	267.5	89.2
TOTAL	629.9	689.6	608.2	1927.7	80.3

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	444.206	222.103			
Treatment	7	4791.140	684.449	8.77**	2.77	4.28
Error	14	1092.394	78.028			
TOTAL	23	6327.740				

** = Highly significant Coefficient of Variation (%) = 11.00

Appendix Table 15 .SXL number

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	148	131	110	389	130
2.21.6.2	86	41	34	161	54
5.19.2.2	116	75	47	238	79
573275	87	61	56	204	68
676070	109	80	117	306	102
Igorota	17	33	17	67	22
Ganza	136	75	80	291	97
Granola	182	91	21	294	98
TOTAL	881	587	482	1950	81

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	10694.250	5347.125			
Treatment	7	23143.833	3306.262	4.27*	2.77	4.28
Error	14	10842.417	774.458			
TOTAL	23	11680.500				

* = Significant Coefficient of Variation (%) = 18.06

Appendix Table 16. Extra big number

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	47	66	62	175	58
2.21.6.2	106	104	72	282	94
5.19.2.2	35	63	36	134	45
573275	115	81	85	281	94
676070	81	67	42	190	63
Igorota	15	44	27	86	29
Ganza	62	45	72	179	60
Granola	38	62	60	160	53
TOTAL	499	532	456	1487	62

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	363.083	181.542			
Treatment	7	10602.292	1514.613	5.74**	2.77	4.28
Error	14	3693.583	263.827			
TOTAL	23	14658.958				

** =Highly significant Coefficient of Variation (%) = 26.22

Appendix Table 17 . Big number

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	43	39	26	108	36
2.21.6.2	95	101	143	339	113
5.19.2.2	26	34	25	85	28
573275	52	67	32	151	50
676070	56	115	54	225	75
Igorota	36	33	26	95	32
Ganza	38	49	53	140	47
Granola	48	46	46	140	47
TOTAL	394	484	405	1283	53

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	602.583	301.292			
Treatment	7	16566.625	2366.661	7.95**	2.77	4.28
Error	14	4166.750	297.625			
TOTAL	23	21335.958				

** =Highly significant Coefficient of Variation (%) = 13.55

Appendix Table 18. Marble number

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	37	26	18	81	27
2.21.6.2	90	57	118	265	88
5.19.2.2	10	28	12	50	17
573275	48	43	48	139	46
676070	45	54	16	115	38
Igorota	15	35	18	68	23
Ganza	25	78	38	141	47
Granola	13	40	15	68	23
TOTAL	283	361	283	927	39

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	507.000	253.500			
Treatment	7	11181.625	1597.375	4.71**	2.77	4.28
Error	14	4751.000	339.357			
TOTAL	23	16439.625				

** =Highly significant Coefficient of Variation (%) = 22.35

Appendix Table 19. Non-marketable number

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	75	68	9	152	51
2.21.6.2	70	58	35	163	54
5.19.2.2	32	21	11	64	21
573275	55	55	28	138	46
676070	25	45	30	100	33
Igorota	26	36	22	84	28
Ganza	96	45	18	159	53
Granola	32	24	34	90	30
TOTAL	411	352	187	950	40

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	3370.083	1685.042			
Treatment	7	3479.167	497.024	1.69^{ns}	2.77	4.28
Error	14	4112.583	293.756			
TOTAL	23	10961.833				

^{ns} = Not significant Coefficient of Variation (%) = 21.77

Appendix Table 20. Total marketable number

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	275	262	216	753	251
2.21.6.2	377	303	367	1047	349
5.19.2.2	187	200	120	507	169
573275	302	252	221	775	258
676070	291	318	229	838	279
Igorota	83	145	88	316	105
Ganza	259	317	243	819	273
Granola	281	239	142	662	221
TOTAL	2055	2036	1626	5717	238

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	14687.583	7343.792			
Treatment	7	115495.292	16499.327	13.41**	2.77	4.28
Error	14	17219.083	1229.935			
TOTAL	23	147401.958				

** =Highly significant Coefficient of Variation (%) = 14.72

Appendix Table 21. Sxl weight

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	15.8	11.7	11.5	39	13.00
2.21.6.2	6.2	4.51	2.9	13.61	4.54
5.19.2.2	13.25	9.15	8.5	30.9	10.30
573275	7.25	5.15	3.5	15.9	5.30
676070	9.7	6.7	11.7	28.1	9.37
Igorota	1.6	3.9	1.65	7.15	2.38
Ganza	13.15	10.3	6.25	29.7	9.90
Granola	16.4	8.2	2.7	27.3	9.10
TOTAL	83.35	59.61	48.7	191.66	7.99

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	78.468	39.234			
Treatment	7	263.423	37.632	5.57**	2.77	4.28
Error	14	94.311	6.737			
TOTAL	23	436.203				

** =Highly significant Coefficient of Variation (%) = 17.54

Appendix Table 22.Extra big weight

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	2.0	2.5	3.2	7.7	2.57
2.21.6.2	4.4	4.5	3.7	12.6	4.20
5.19.2.2	1.7	2.95	1.0	5.65	1.88
573275	4.7	3.2	3.0	10.9	3.63
676070	3.4	1.45	1.6	6.45	2.15
Igorota	0.9	1.7	1.65	4.25	1.42
Ganza	2.2	2.4	2.7	7.3	2.43
Granola	1.6	4.7	3.5	9.8	3.27
TOTAL	20.9	23.4	20.35	64.65	2.69

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	0.661	0.330			
Treatment	7	18.442	2.635	3.10*	2.77	4.28
Error	14	11.894	0.850			
TOTAL	23	30.997				

* = Not significant Coefficient of Variation (%) = 14.16

Appendix Table 23. Big weight

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	1.30	1.2	1.4	3.90	1.30
2.21.6.2	2.3	2.1	3.8	8.20	2.73
5.19.2.2	0.7	0.9	0.4	2.00	0.67
573275	1	1.3	1.1	3.40	1.13
676070	1.2	4.55	1	6.75	2.25
Igorota	1.2	0.85	1.8	3.85	1.28
Ganza	1.3	1.3	0.5	3.10	1.03
Granola	1	0.75	0.7	2.45	0.82
TOTAL	10.00	12.95	10.7	33.65	1.40

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	0.594	0.297			
Treatment	7	10.822	1.546	2.12^{ns}	2.77	4.28
Error	14	10.221	0.730			
TOTAL	23	21.637				

^{ns} = Not significant Coefficient of Variation (%) = 17.33

Appendix Table 24. Marble weight

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	0.55	0.45	0.3	1.3	0.43
2.21.6.2	1.15	2.5	0.2	3.85	1.28
5.19.2.2	0.1	0.3	0.1	0.5	0.17
573275	0.6	0.6	0.5	1.7	0.57
676070	0.5	0.55	0.4	1.45	0.48
Igorota	0.2	0.5	0.4	1.1	0.37
Ganza	0.3	0.4	0.4	1.1	0.37
Granola	0.4	0.45	0.2	1.05	0.35
TOTAL	3.80	5.75	2.5	12.05	0.50

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	0.669	0.334			
Treatment	7	2.376	0.339	2.19^{ns}	2.77	4.28
Error	14	2.168	0.155			
TOTAL	23	5.212				

^{ns} =Not significant Coefficient of Variation (%) = 14.12

Appendix Table 25. non-marketable weight

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	1.35	1.05	0.65	3.05	1.02
2.21.6.2	1.45	0.65	0.2	2.3	0.77
5.19.2.2	1.15	0.625	0.15	1.925	0.64
573275	1.15	0.65	0.5	2.3	0.77
676070	1.00	1.2	0.6	2.8	0.93
Igorota	0.35	0.7	0.65	1.7	0.57
Ganza	4.5	1.4	0.2	6.1	2.03
Granola	1.1	0.85	1.3	3.25	1.08
TOTAL	12.05	7.125	4.25	23.425	0.98

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	3.890	1.945			
Treatment	7	4.500	0.643	1.11^{ns}	2.77	4.28
Error	14	8.097	0.578			
TOTAL	23	16.487				

^{ns} = Not significant Coefficient of Variation (%) = 21.10

Appendix Table 26. Total weight

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	21.00	16.90	17.05	54.95	18.32
2.21.6.2	15.50	14.26	10.80	40.56	13.52
5.19.2.2	16.90	13.92	10.15	40.97	13.66
573275	14.70	10.90	8.60	34.20	11.40
676070	15.80	14.45	15.30	45.55	15.18
Igorota	4.25	7.65	6.15	18.05	6.02
Ganza	21.45	15.80	10.50	47.30	15.77
Granola	20.50	14.95	8.40	43.85	14.62
TOTAL	130.10	108.83	86.95	325.43	13.56

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	116.378	5.189			
Treatment	7	280.522	40.075	6.36**	2.77	4.28
Error	14	88.247	6.303			
TOTAL	23	485.147				

* * = Highly significant Coefficient of Variation (%) = 18.49

Appendix Table 27. Computed yield

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	42.00	33.80	34.10	109.90	36.63
2.21.6.2	31.00	38.52	21.60	81.12	27.04
5.19.2.2	33.80	27.84	20.30	81.94	27.32
573275	29.40	21.80	16.40	67.60	22.53
676070	31.60	28.90	30.60	91.10	30.36
Igorota	8.50	15.30	12.30	36.10	12.04
Ganza	42.90	31.60	21.00	95.50	31.83
Granola	41.00	29.90	16.80	87.70	29.24
TOTAL	260.20	217.66	173.10	650.96	27.12

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	474.236	237.118			
Treatment	7	1128.244	161.321	6.39**	2.77	4.28
Error	14	353.651	25.26			
TOTAL	23	1957.131				

**= Highly significant Coefficient of Variation (%) = 18.59

Appendix Table 28. Harvest Index

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	0.83	0.65	0.82	2.3	0.77
2.21.6.2	0.68	0.77	0.76	2.21	0.74
5.19.2.2	0.73	0.48	0.72	1.93	0.64
573275	0.89	0.89	0.87	2.65	0.88
676070	0.86	0.83	0.91	2.6	0.87
Igorota	0.79	0.83	0.83	2.45	0.82
Ganza	0.72	0.76	0.84	2.32	0.77
Granola	0.93	0.92	0.84	2.69	0.90
TOTAL	6.43	6.13	6.59	19.15	0.80

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	0.014	0.007			
Treatment	7	0.154	0.003	4.48**	2.77	4.28
Error	14	0.069	0.005			
TOTAL	23	0.236				

** =Highly significant Coefficient of Variation (%) = 8.78

Appendix Table 29.Dry matter content

Entries	BLOCK			TOTAL	MEAN
	I	II	III		
380241.17	20	19	18	57	19
2.21.6.2	21	25	22	68	23
5.19.2.2	17	19	22	58	19
573275	20	19	21	60	20
676070	18	20	19	57	19
Igorota	20	20	23	63	21
Ganza	21	21	18	60	20
Granola	18	17	18	53	18
TOTAL	155	160	161	476	20

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	2.583	1.292			
Treatment	7	47.333	6.762	2.53^{ns}	2.77	4.28
Error	14	37.417	2.673			
TOTAL	23	87.333				

^{ns} = Not significant Coefficient of Variation (%) = 8.24

CA-UR Form 9

Benguet State University
COLLEGE OF AGRICULTURE
La Trinidad, Benguet

Date: March 2009

APPLICATION FOR THESIS MANUSCRIPT ORAL DEFENSE

Name: JULIUS BAG-AYAN
Degree (Major Field): BACHELOR OF SCIENCE IN AGRICULTURE (Agronomy)
Title of Research: EVALUATION OF POTATO ENTRIES IN SAGPAT, KIBUNGAN, BENGUET CONDITION.
Date and time of Defense: October 21 2009
Place of Defense: College of Agriculture (Room 201)

Endorsed: JANET P.PABLO
Adviser and Chairperson, Advisory Committee

Approved: ESTHER JOSEPHINE D. SAGALLA
Member, advisory committee and
Department Chairman

RESULT OF ORAL DEFENSE

Name and Signature	Remarks (Passed/Failed)
GUERZON A. PAYANGDO Member, Advisory Committee	_____
DANILO P. PADUA Member, Advisory Committee	_____
JANET P. PABLO Adviser and Chairperson, Advisory Committee	_____
ESTHER JOSEPHINE D. SAGALLA Member, Advisory Committee and Department Chairman	_____