BIBLIOGRAPHY

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ABSTRACT

The study was conducted to identify the best performing potato entry based on yield and resistance to late blight during the wet season; identify the potato entries which are best adapted during the wet season at Madaymen, Kibungan, and to determine the profitability of growing the different potato entries during the wet season at Madaymen, Kibungan.

Phil 2.21.6.2 had the highest percent survival, highly vigorous, and produced the highest number and heaviest weight of marketable and non-marketable tubers. Furthermore, Phil 2.21.6.2 was resistant to late blight despite the adverse climatic condition.

Phil 2.21.6.2, however had a negative return on cash expense but may still be recommended for wet season planting at Madaymen, Kibungan if provided with proper management practices.

TABLE OF CONTENTS

INTRODUCTION

Potato *(Solanum tuberosum* L.) is one of the tuber crops grown in the Philippines particularly in Benguet and Mountain Province (PCARRD, 1982).

Potato production in these areas has not yet reached its maximum production. One reason for the low potato production is the lack of potato varieties that are adapted to the wet season to ensure year-round supply. Potatoes during the wet season are prone to rotting and low yield. Another reason is the use of potato varieties that are low yielding and did not undergo the evaluation process. Still other reason might be the early occurrence of diseases such as late blight and bacterial wilt. These diseases affect the growth of plants and may lead to unsuccessful production. The unsuitableness of some potato varieties to their growing environment may also contribute to the low production (PCARRD, 1982).

In order to have a continuous supply of better quality potatoes, selection of potato varieties that have shown good yields and resistance to pests and disease during the wet season should be continuously employed.

Using the right variety ensures a high yield and better quality of produce. Thus, introduction of different potato varieties that are high yielding, not susceptible to pests and disease, and maybe grown during the wet season will help the potato growers to increase their production.

The outcome of this study, will serve as a guide to the farmer in selecting and growing potato varieties for better production at Madaymen, Kibungan.

The study aimed to:

1. identify the best performing potato entry based on yield and resistance to pests and disease during the wet season;

2. identify the potato entry that is best adapted during the wet season at Madaymen, Kibungan; and

3. determine the profitability of growing the different potato entries during the wet season at Madaymen, Kibungan.

The study was conducted from June to September 2008 at Madaymen, Kibungan, Benguet.

REVIEW OF LITERATURE

Potato Production in the Philippines

Potato is one of the major root crops cultivated in Benguet and Mountain Province. At present potato production has not yet reached the maximum production (Gayao, ., 1989). In the Philippines, the demand of the potatoes continues to increase because of the growing population rise in the number of fast food chains, hotels, restaurants and pre-service of local potato based snack food manufacturers (PCARRD, 1985).

One major problem in potato production is the poor quality of potato varieties which are low yielding, susceptible to pests and diseases, and not adapted to the locality. To address this problem research institution look for high yielding varieties, resistant to pests and diseases, and best adapted under different locations and conditions (PCARRD, 1985). Likewise, according to Ganga, *et al*.,(1987) chemical control with fungicides in the Philippines ensued because almost all commercial potato cultivars lack sufficient resistance to late blight.

Tad-awan, *et al*., (2008), cited that the potato growing area in the Philippines is represented by a variety of agro-ecological conditions that favors the production of high value vegetables crops that are globally competitive. It has the unique cool climate favoring the production of temperate vegetables such as cabbage and potato.

Soil and Temperature Requirement

The environment for growing potatoes markedly affects the yield. Aside from production technology, the highlands obtained high yields due to favorable temperature. Simongo, (2007) 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 wide range of soil adaptation. For optimum, yields, a deep well drained loam or sandy loam with a soil pH of 5.5 to 6.0 is required for temperate cultivars, maximum yields are normally obtained when the average temperature through out the growing season ranges between 15-18^{0} C. A cool night temperature appears to be more important than a cool daytime temperature. High temperature during the day reduces yield (PCARRD, 1985).

Principles of Varietal Evaluation

Varietal evaluation is the process in crop breeding programs that provides comparison developed by the cultivars such as yield, adaptability to different locations, insect pest's resistance and growth performance (HARRDEC, 1996).

Rasco and Amante (1990) stated that success in varietal evaluation is ultimately measured in terms of acceptability of the variety that undergoes evaluation process to users of the variety. The farmers may initially accept a new variety because it suits his farming practices and he finds it to be better yielding than his traditional variety but may stop if he finds out that the traders are not willing to buy it.

Sunil (1990) stated 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 pests and diseases.

Bautista and Mabesa (1977) suggested that cultivars to be selected should be high yielding, insect pests, disease resistant, and early maturing variety so that growing of crops entails less expenses and hence ensures more profit. The use of high yielding varieties is the cheapest means of increasing yield. On the other hand Gonzales, *et al*., (2006) stated that evaluation of advance potato entries should be conducted in three location or more representing low, mid and high elevation during wet and dry season to obtain stable growth, yield and processing qualities under varying conditions.

Importance of Varietal Evaluation

High yielding and improved varieties are known to play an important role in production. Large numbers of indigenous accession of variable plant species and numbers of cultivars are selected and recommended for multiple production (HARRDEC, 1996).

The importance of varietal evaluation is to observed the performance of characters and traits of a crop such as yield, adaptability, growth and resistant to pest and diseases (Work, et al, 1975).

The first decision in planting is to know the best variety that is suited to the locality. Using the right variety ensures a high yield and better quality of produce. Trial planting will be done to test new varieties suitable for a certain locality before planting in a wide scale (HARRDEC, 1996).

Varietal Adaptation and Selection

Dacwag (1981) stated that climate is the summation of condition which includes three factors such as temperature, moisture and light. These three factors determine where, when, and what plant should be planted.

Some varieties of potato are adaptable and thus profitable and other varieties which are non adaptable to the area's condition are relatively unprofitable to the farmer's need (Bang-as, 1999).

During the 1990s potato producers in Benguet and Mountain Province preferred the old cultivar because of their resistance to pests (PCARRD, 1982).

Yield is usually the main consideration in selecting cultivars. Many farmers plant the same cultivars during the next season, if they obtained very high yields in the previous season.

Cultivars also differ in yield stability over location even within the same general area. To avoid unexpected yield, cultivars that have been tested over many location and have shown good yield and disease pests resistant in such trials (PCARRD, 1982). Furthermore, Ganga, *et al.*, *(*1987) stated that most of the existing varieties have low yield and susceptible to late blight, the use of resistant varieties is the best and most economical control against late blight infection.

Gonzales, *et, al.*, (2006) reported that their decade evaluation resulted to the new released of two potato variety for the highland named: Gloria and Bengueta Patatas, these were evaluated across location and season, before it was finally recommended.

MATERIALS AND METHODS

Description of the site

Madaymen is located at the northern part of the municipality. It has a land area of 1,260 m^2 of which 89 % are devoted to agriculture and 5.36% forests land with an elevation of more than 2,500 feet above sea level and has topography of mountainous with inland valleys. The place has a very cold temperature ranging from 10 ^{0}C to 16^{0}C during wet season and 20 ^{o}C at dry season. Its cold temperature is favorable for vegetable production such as cabbage, potatoes, radish and other upland vegetable. (Salacza, 2008).

Field Preparation

An area measuring 135 square meters was cleaned and thoroughly prepared. The area was divided into three blocks containing eight plots measuring 1 x 5 m^2 each to accommodate the eight potato entries. Chicken manure at the rate of 5 t ha^{-1} were basally applied before planting and the recommended rate of T-14 (14-140-140 kg NPK ha^{-1}) were side dressed 30 days after planting. Crop protection like spraying of fungicides and pesticides was uniformly employed at 5 days interval. Other cultural practices such as weeding were also employed as recommended to ensure good growth and yield of the plants.

The eight entries were acquired at NPRCRTC and were planted at a distance of 25 cm x 30 cm between hills and rows.

The different treatments were replicated three times and laid out in randomized completely block design (RCBD).

Treatment

The potato entries evaluated were:

Code	Entry	Locality of Collection
E_1	Phil. 2.21.6.2	NPRCRTC
E_2	Phil. 5.19.2.2	NPRCRTC
E_3	CIP 380241.17	CIP, Peru
E_4	CIP 676070	CIP, Peru
E_5	CIP 573275	CIP, Peru
E_6	Igorota (cv)	NPRCRTC
E_7	Ganza (cv)	CIP, Peru
E_8	Granola (cv)	CIP, Peru

Data gathered:

1. Meteorological data. Temperature and relative humidity were taken using a compact hygrometer. Rainfall was taken by placing cans in the field to collect water when precipitation occurs. The volume of water collected was measured using a beaker and was recorded by getting the average volume of the water from the cans.

2. Percent survival. This was the number of plants that survived one month after planting and computed using the formula:

$$\% \text{ Survival} = \frac{\text{No. of plants survived}}{\text{Total number of plants planted}} \times 100$$

3. Plant vigor. This was taken at 30, 45, and 60 days after planting using the rating scale of 1 – 5 (CIP, 2004).

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

4. Canopy cover. This was taken at 30, 45, 60 and 75 days after planting (DAP) using a wooden frame 120 x 60 cm with equally sized 12 x 6 cm grids.

5. Initial and final plant height (cm). Plant height was measured from the base to the tip of ten sample plants one month after planting and one week before harvesting.

6. Reaction to leaf miner. This was taken at 30, 45, 60 and 75 days after planting and was rated using the scale of 1 – 5 (CIP, 2001).

Scale	Description	Remarks
1	Less than 20% of the 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

7. Reaction to late blight. This was observed and recorded at 30, 45, 60 and 75 days after planting using the CIP scale (Henfling, 1987).

CIP scale value	Blight (%)		Symptoms
	Mean	limits	
1	0		No late blight observable
2	2.5	Traces -< 5	Late blight present. Maximum 10 lesions per plant
3	10	5 -< 15	Plants look healthy, but lesions are easily seen at closer distance. Maximum foliage area affected by lesions or destroyed corresponds to more than 20 leaflets.
4	25	15 -< 35	Late blight easily seen on most plants. About 25% of foliages is covered with lesions or destroyed.
5	50	35 -< 65	Plot looks green; however, all plants are affected. Lower leaves are dead. About half the foliage 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 plants are destroyed.
7	90	85 -< 95	Plot neither predominantly green nor brown. Only top leaves are green. Many stems have large lesions.
8	97.5	95 -< 100	Plot is brown-colored. A few top leaves still have some green areas. Most stems have lesions or are dead.
9	100		All leaves and stems dead.

The description of symptoms is based on plants with 4 stems and 10 to 12 leaves per stem.

8. Bacterial wilt infection. This was obtained at 30, 45, 60 and 75 days after planting using the scale 1-5 (CIP, 2001).

Scale	Description	Remarks
1	No infection	Highly resistant

2	1-25% infection	Moderately resistant
3	26-50% infection	Susceptible
4	51-75% infection	Moderately susceptible
5	75-100% infection	Very susceptible

9. Number and weight of marketable tubers plot^{-1} (kg). All tubers that have marketable size, not malformed, free from cuts, cracks and without more than 10% greening of the total surface are counted and weighed at harvest.

10. Number and weight of non-marketable tubers plot^{-1} (kg.). These were the tubers that were malformed, damaged by pest and disease, and those with more than 10% greening.

11. Total yield per plot (kg). The sum of the weight of marketable and non-marketable tubers were taken.

12. Computed yield (t ha^{-1}). This was computed in hectare basis using the formula:

$$\text{Yield t ha}^{-1} = \frac{\text{Total yield plot}^{-1}}{\text{Plot size (m}^2\text{)}} \times 10,000/1000$$

13. Return on Cash Expense (ROCE). This was computed by dividing the net profit over the total cost of production multiplied by 100.

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

14. Dry matter content of tubers (DMC). Tubers were weighed into 20 g per sample, sliced into cubes, and oven dried at 80 ^{o}C for 48 hours. This was recorded and computed using the following formula:

% Dry matter content (DMC) = 100% - %MC

Where:

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

Analysis of data

All quantitative data were analyzed through analysis of variance (ANOVA) for randomized complete block design (RCBD) with three replications. Significance of difference among the treatment means was tested using the Duncan's Multiple Range Test (DMRT) at 5% level of significance.

RESULTS AND DISCUSSION

Rainfall, Temperature and Relative Humidity

Rainfall and relative humidity was high from July to September (Table 1). Rainfall was highest during the 5^{th} week of July (19.88 L) while relative humidity reached 100% during the growth of the plants. Temperature was also low ranging from 10 to 15^{0}C. These conditions were not favorable for potato growth and development. The best temperature for potato production is from 17^{0}C to 22^{0}C and a relative humidity of 87 % (HARRDEC, 1996).

The high temperature and relative humidity favored the widespread of late blight disease resulting in decrease ground cover and poor vigor of the plants. Low temperature also caused decline in potato growth and yield.

Table 1. Rainfall, temperature and relative humidity from July to September 2008

WEEK	RAINFALL (L)	TEMPERATURE (^{0}C)	RELATIVE HUMIDITY (%)
July			
Week 1	4.50	15.00	100
Week 2	10.78	15.00	87
Week 3	18.78	11.00	85
Week 4	11.17	10.70	85
Week 5	19.88	10.70	99
August			
Week 1	13.93	15.00	98
Week 2	15.45	10.00	100
Week 3	6.81	15.00	88
Week 4	11.51	15.00	100
September			
Week 1	9.83	10.30	99
Week 2	11.79	10.00	100
Week 3	10.46	10.50	93
Week 4	11.12	10.00	100

Percent Survival

Phil. 2.21.6.2 had the highest percent survival while the check variety Ganza had the lowest survival of 88% (Table 2). This result indicates that most of the entries may survive the early onset of rainfall. Ganza, on the other hand may not be suitable for cultivation during the wet season.

Plant Vigor

No significant differences were observed on plant vigor of the potato entries evaluated (Table 2). All the entries exhibited decreasing vigor from 30 to 60 days after planting (DAP). Most plants were moderately to highly vigorous at 30 DAP. At 60 DAP, most of the entries had poor vigor except for Phil. 2.21.6.2 which was moderately vigorous.

This decrease in vigor might be attributed to the high rainfall and relative humidity of the site. Potatoes are adapted to 87% relative humidity and low rainfall (HARRDEC, 1996).

Canopy Cover

Canopy cover of the eight potato entries were highly significant (Table 3). A decreasing canopy cover was observed among the entries from 30 to 75 DAP.

The decreasing trend of the canopy cover maybe due to the heavy rains coupled with strong winds which caused the high occurrence of late blight in some of the entries during the conduct of the study.

Table 2. Percentage survival and plant vigor at 30, 45, and 60 DAP of eight potato entries

ENTRY	SURVIVAL (%)	PLANT VIGOR DAYS AFTER PLANTING		
		30	45	60
Phil. 2.21.6.2	100[a]	5	5	3
Phil. 5.19.2.2	98[ab]	3	4	1
CIP 380241.17	99[ab]	4	4	1
CIP 676070	97[ab]	4	4	1
CIP 573275	98[ab]	4	4	1
IGOROTA	96[ab]	4	3	1
GANZA	88[b]	4	3	2
GRANOLA	99[ab]	1	4	2
CV (%)	8.86	13.63	22.12	18.77

*Means with the same letter are not significantly different at 5% level by DMRT.

Rating Scale: 1–very poor; 2– less vigorous; 3–moderately vigorous; 4-vigorous;
5 – Highly vigorous

Generally, Phil. 2.21.6.2 had the widest canopy which might be an indication of resistance to late blight and adaptability to wet season planting. CIP 380241.17 and CIP 676070 might also be adapted to the wet season.

Table 3. Canopy cover at 30, 45, 60 and 75 days after planting of the eight potato entries

ENTRY	CANOPY COVER DAYS AFTER PLANTING			
	30	45	60	75
Phil. 2.21.6.2	34	43	32	29
Phil. 5.19.2.2	30	36	3	4
CIP 380241.17	52	49	13	7
CIP 676070	40	47	10	4
CIP 573275	33	35	1	-
IGOROTA	27	39	6	1
GANZA	34	28	1	-
GRANOLA	33	44	15	-
CV (%)	17.73	22.93	24.31	29.02

*Means with the same letter are not significantly different at 5% level by DMRT.
- =no canopy cover

Figure 1. Plant stand at 45 DAP

Initial and Final Plant Height

Highly significant differences were observed on the plant height of the eight potato entries at 30 and 90 DAP. CIP 380241.17 was the tallest followed by CIP 573275 while the check variety Ganza was the shortest at 30 DAP. (Table 4). CIP 380241.17, Phil. 5.19.2.2 and cvs Ganza and Granola plants did not survive at 90 DAP due to high late blight incidence. Phil. 2.21.6.2 was the tallest at 90 DAP.

The differences in height might due to their genotypic characteristics or the long days during the wet season (Sano, 1980).

Table 4. Plant height at 30 and 90 days after planting of the eight potato entries

ENTRY	HEIGHT	
	Initial (cm)	Final (cm)
Phil. 2.21.6.2	1180.60[b]	3886.00 [a]
Phil. 5.19.2.2	1053.50[b]	-
CIP 380241.17	2206.80[a]	-
CIP 676070	1230.30[b]	920.80[b]
CIP 573275	1323.30[b]	253.30[cd]
IGOROTA	1110.30[b]	798.70[bc]
GANZA	420.00[c]	-
GRANOLA	900.20[b]	-
CV (%)	20.14	26.12

*Means with the same letter are not significantly different at 5% level by DMRT

**Note: Entries with - died at 90 DAP

Reaction to Late Blight

All the entries were resistant to highly resistant at 30 DAP (Table 5). However, late blight incidence increased as early as 45 DAP affecting most of the entries except CIP 2.21.6.2 which remained moderately resistant until 75 DAP. The check varieties Ganza and Granola including Phil. 5.19.2.2 and CIP 573275 were susceptible to the disease.

The late blight resistance of Phil. 2.21.6.2 might be attributed to its genetic make-up and may be by its wide canopy.

Furthermore, the high amount of rainfall, low temperature and high relative humidity during the evaluation period might have favored the fast development of the disease. This result corroborates with the result of Ganga *et. al.* (1989) that late blight is more prevalent during the wet and cool season.

Reaction to Leaf Miner and Bacterial Wilt

Leaf miner infestation and bacterial wilt infection were not observed during the evaluation period. This might be due to the heavy rain and low temperature observed during the conduct of the study.

Bacterial wilt is favored by high temperature (PCARRD, 1982) and temperature was low (10 to 15^0C) during the evaluation period. In addition, the planting materials were disease- free.

Table 5. Late blight incidence at 30, 45, 60 and 75 DAP of the eight potato entries

ENTRY	REACTION TO LATE BLIGHT DAYS AFTER PLANTING			
	30	45	60	75
Phil. 2.21.6.2	1	2	3	5
Phil.5.19.2.2	2	6	9	9
CIP 380241.17	1	5	6	8
CIP 676070	1	5	7	9
CIP 573275	1	6	8	9
IGOROTA	2	5	7	7
GANZA	1	7	9	9
GRANOLA	1	6	9	9

Rating Scale: 1 –highly resistant; 2 – 3 – resistant; 4 – 5 – moderately resistant
6 – 7 - moderately susceptible; 8 – 9 – susceptible

Number and Weight of Marketable Tubers

Phil. 2.21.6.2 significantly produced the number and heaviest marketable tubers. The least was produced by Phil. 5.19.2.2 while check variety Ganza had no tubers.

The highest number and heaviest weight of marketable tubers obtained from Phil. 2.21.6.2 (Fig.3) might attributed to its high percentage survival, wide canopy cover, high vigor, and resistance to late blight.

The low yield of Ganza and Phil. 5.19.2.2 might be due to its susceptibility to late blight, poor vigor, and adverse environmental conditions such as rainfall and high relative humidity.

Table 6. Number and weight of marketable and non-marketable tubers harvested from the eight potato entries

ENTRY	MARKETABLE TUBERS (per 5m^2)		NON-MARKETABLER TUBERS (per 5 m^2)	
	NUMBER	WEIGHT (kg)	NUMBER	WEIGHT (kg)
Phil. 2.21.6.2	155 ^{a}	3.43 ^{a}	113^{a}	0.16 ^{a}
Phil.5.19.2.2	56^{bc}	1.27^{bc}	10 ^{d}	0.01^{b}
CIP380241.17	31^{bc}	2.17^{b}	31^{c}	0.04^{b}
CIP 676070	131^{b}	1.43^{bc}	40^{bc}	0.06^{b}
CIP 573275	44^{bc}	0.80^{cd}	43^{bc}	0.03^{b}
IGOROTA	56^{bc}	1.27^{bc}	45 ^{bc}	0.04^{b}
GANZA	0^{c}	0.00^{d}	15^{d}	0.02^{b}
GRANOLA	41^{bc}	0.80^{cd}	49^{b}	0.04^{b}
CV (%)	20.07	10.31	23.70	4.64

*Means with the same letter are not significantly different at 5% level by DMRT

Number and Weight of Non-marketable Tubers

Phil. 2.21.6.2 significantly produced the highest number and weight of non-marketable tubers while Phil. 5.19.2.2 had the least number and weight of non-marketable tubers.

The high number and weight of non-marketable tubers of Phil. 2.21.6.2might be due to high late blight infection and the adverse climatic conditions during the conduct of the study.

(a) CIP 676070

(b) Phil. 2.21.6.2

(c) Phil. 5.19.2.2

(d) Igorota (cv)

(e) CIP 380241.17

(f) CIP 573275

(g) Ganza (cv)

(h) Granola (cv)

Figure 3. Tubers of the different potato entries

Total Yield and Computed Yield

Phil. 2.21.6.2 obtained the highest yield per plot and computed yield per hectare followed by CIP 380241.17. Check variety Ganza produced the lowest yield.

The yield was generally low due to the high late blight incidence, low canopy cover and poor plant vigor of most entries. These conditions were exacerbated by the high rainfall and low temperature that occurred during the growing period.

Table 7. Total and computed yield of eight potato entries

	YIELD	
ENTRY	kg 5 m^2	t ha^{-1}
Phil. 2.21.6.2	3.60 [a]	7.19[a]
Phil. 5.19.2.2	0.60 [cd]	1.19[cd]
CIP 380241.17	2.20[b]	4.41[b]
CIP 676070	1.49[bc]	2.99[bc]
CIP 573275	0.83[cd]	1.67[cd]
IGOROTA	1.31[bc]	2.62[bc]
GANZA	0.02[d]	0.05[d]
GRANOLA	0.83cd	1.67[cd]
CV (%)	15.76	12.99

*Means with the same letter are not significantly different at 5% level by DMRT

Dry Matter Content of Tubers

CIP 676070, CIP 573275 and Phil.5.19.2.2 had identical tuber dry matter contents of 18% which is comparable with the dry matter content of the processing variety Igorota (16%). Low tuber dry matter was recorded from CIP 380241.17 (Table 8).

The low dry matter content of tubers might be due to the decreased canopy cover of the entries evaluated. The necessary assimilates needed by the tubers were not fully diverted hence, the canopy cover decreased as early as 60 DAP (Simongo, 1992).

Low dry matter content of tubers could also be influence by the wet and cool season (Beukemia and Vander Zaag, 1979).

The differences in tuber dry matter content of the entries evaluated might be due to the genotypic characteristics since dry matter is a strongly inherited character (Rastovski, 1978).

Return on Cash Expense

Return on cash expense obtained from the different entries evaluated were all negative. The negative return on cash expense may be attributed to the the low yield and high late blight infection of the different entries. This implies that growing of potatoes during the wet season at Madaymen Kibungan may not be profitable.

Table 8. Dry matter content of the eight potato entries

ENTRY	DRY MATTER CONTENT (%)
Phil. 2.21.6.2	15[abc]
Phil. 5.19.2.2	18[a]
CIP 380241.17	12[c]
CIP 676070	18[a]
CIP 573275	18[a]
IGOROTA (cv)	16[ab]
GANZA (cv)	14[bc]
GRANOLA (cv)	13[bc]
CV (%)	11.56

*Means with the same letter are not significantly different at 5% level by DMRT

Table 9. Return on cash expense of the eight potato entries

ENTRY	COST OF PRODUC-TION (PhP)	MARKETABLE TUBERS (kg/5m^2)	GROSS SALE (PhP)	NET INCOME (PhP)	ROCE (%)
Phil. 2.21.6.2	510.00	3.43	102.99	-407.01	-79.80
Phil. 5.19.2.2	510.00	0.58	17.49	-492.51	-96.57
CIP 380241.17	510.00	2.17	65.01	-444.99	-87.25
CIP 676070	510.00	1.43	42.99	-467.01	-91.57
CIP 573275	510.00	0.80	24.00	-486.00	-95.29
IGOROTA (cv)	510.00	1.27	38.01	-471.99	-92.54
GANZA (cv)	510.00	0.00	0.00	-510.00	-100.00
GRANOLA (cv)	510.00	0.80	24.00	-486.00	-95.29

* Total cost of production includes cost of planting materials, insecticides, fertilizers and labor.
* Selling price of potato tubers is based in PhP 30.00 per kilo

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

The study was conducted to identify the best performing potato entry based on yield and resistance to pests an diseases during the wet season, identify the potato entry that is best adapted during the wet season at Madaymen, Kibungan, and to determine the profitability of growing the different potato entries during the wet season at Madaymen, Kibungan.

Phil. 2.21.6.2 had the highest plant survival while Ganza had the lowest.

Phil. 2.21.6.2 was highly vigorous while cv Granola had poor vigor. The rest of the entries were moderately vigorous to vigorous at 30 DAP. At 60 DAP, all the entries had poor to less vigor except for Phil. 2.21.6.2 which was moderately vigorous.

Conclusion

Among the potato entries evaluated during the wet season, Phil. 2.21.6.2 was the best performing potato entry based on yield and resistance to late blight.

Phil. 2.21.6.2 is therefore adapted at Madaymen Kibungan especially when proper management practices are employed. Phil. 2.21.6.2 had the widest canopy at 60 and 75 DAP. It was also resistant to moderately resistant to late blight while the rest of the entries were moderately to highly susceptible at 60 and 75 DAP.

Phil. 2.21.6.2 produced the highest number and heaviest weight of marketable and non-marketable tubers while Phil. 5.19.2.2 produced the least.

The highest tuber dry matter content was recorded from CIP 573275, CIP 676070 and Phil. 5.19.2.2 while CIP 380241.17 had the lowest.

A negative ROCE was obtai, KibunHowever, all the entries obtained negative return on cash expense which implies that growing of potatoes during the wet season at Madaymen, Kibungan is not profitable.

Recommendation

Based on findings, Phil. 2.21.6.2 could be recommended at Madaymen, Kibungan based only on yield and resistance to late blight.

Production of potatoes during the wet season is not recommended at M

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APPENDICES

Appendix table 1. Percent survival at 30 DAP

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	100	100	100	300	100[a]
Phil. 5.19.2.2	100	100	93	293	98[ab]
CIP 380241.17	100	98	100	298	99[ab]
CIP 676070	100	90	100	290	97[ab]
CIP 573275	100	98	95	293	98[ab]
IGOROTA (cv)	100	95	93	288	96[ab]
GANZA (cv)	65	100	100	265	88[b]
GRANOLA (cv)	100	98	100	298	99[ab]
TOTAL	765	779	781	2325	97

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	19.000	9.500			
Treatment	7	290.625	41.518	4.21*	2.77	4.28
Error	14	941.000	67.214			
TOTAL	23	1250.625				

* = Significant

Coefficient of Variation (%) =8.86

Appendix table 2a. Plant vigor at 30 DAP

ENTRY	BLOCK I	BLOCK II	BLOCK III	TOTAL	MEAN
Phil. 2.21.6.2	1	1	2	4	1
Phil. 5.19.2.2	2	2	1	5	2
CIP 380241.17	1	1	2	4	1
CIP 676070	1	2	4	7	2
CIP 573275	1	1	1	3	1
IGOROTA (cv)	1	2	2	5	2
GANZA (cv)	1	1	1	3	1
GRANOLA (cv)	1	1	2	4	1
TOTAL	9	11	15	35	1.4

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F 0.05	TABULATED F 0.01
Block	2	2.333	1.167			
Treatment	7	3.958	0.565	1.40^{ns}	2.77	4.28
Error	14	5.667	0.405			
TOTAL	23	11.958				

^{ns} =Not significant

Coefficient of Variation (%) = 13.63

Appendix table 2b. Plant vigor at 45 DAP

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	4	4	4	12	3
Phil. 5.19.2.2	4	4	4	12	4
CIP 380241.17	4	4	4	12	4
CIP 676070	3	4	4	11	4
CIP 573275	4	4	4	12	4
IGOROTA (cv)	3	4	3	10	3
GANZA (cv)	0	4	4	8	3
GRANOLA (cv)	4	4	4	12	3
TOTAL	25	32	31	88	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	2.583	1.292			
Treatment	7	4.958	0.708	1.05^{ns}	2.77	4.28
Error	14	9.417	0.673			
TOTAL	23	16.958				

^{ns} =Not significant

Coefficient of Variation (%) = 22.12

Appendix table 2c. Plant vigor at 60 DAP.

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	5	4	5	14	5
Phil. 5.19.2.2	4	0	0	4	1
CIP 380241.17	4	4	5	13	4
CIP 676070	4	5	5	14	5
CIP 573275	5	5	0	10	3
IGOROTA (cv)	4	5	4	13	4
GANZA (cv)	0	5	0	5	2
GRANOLA (cv)	0	5	0	5	2
TOTAL	26	33	19	78	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	12.250	6.125			
Treatment	7	45.167	6.452	1.77^{ns}	2.77	4.28
Error	14	51.083	3.649			
TOTAL	23	108.500				

^{ns} =Not significant Coefficient of Variation (%) =18.77

Appendix table 3a. Canopy cover at 30 DAP

ENTRY	BLOCK I	BLOCK II	BLOCK III	TOTAL	MEAN
Phil. 2.21.6.2	39	28	34	101	34
Phil. 5.19.2.2	37	29	25	91	30
CIP 380241.17	62	44	50	156	52
CIP 676070	46	37	36	119	40
CIP 573275	38	34	26	98	33
IGOROTA (cv)	24	32	25	81	27
GANZA (cv)	27	41	34	102	34
GRANOLA (cv)	36	41	23	100	33
TOTAL	309	286	253	848	35

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F 0.05	TABULATED F 0.01
Block	2	198.083	99.042			
Treatment	7	1220.000	174.286	4.44**	2.77	4.28
Error	14	549.250	39.232			
TOTAL	23	1967.333				

** =Highly significant

Coefficient of Variation (%) =17.73

Appendix table 3b. Canopy cover at 45 DAP.

ENTRY	BLOCK I	BLOCK II	BLOCK III	TOTAL	MEAN
Phil. 2.21.6.2	52	41	37	130	43
Phil. 5.19.2.2	55	21	32	108	36
CIP 380241.17	57	38	52	147	49
CIP 676070	42	52	47	141	47
CIP 573275	38	32	34	104	35
IGOROTA (cv)	33	43	41	117	39
GANZA (cv)	0	42	41	83	28
GRANOLA (cv)	45	50	38	133	44
TOTAL	322	319	322	963	40

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F 0.05	TABULATED F 0.01
Block	2	0.750	0750			
Treatment	7	1071.958	171.958	153.137**	2.77	4.28
Error	14	2261.917	2261.917			
TOTAL	23	3334.625	3334.625			

** =Highly significant

Coefficient of Variation (%)=22.93

Appendix table 3c. Canopy cover at 60 DAP.

ENTRY	BLOCK I	BLOCK II	BLOCK III	TOTAL	MEAN
Phil. 2.21.6.2	25	25	45	95	32
Phil. 5.19.2.2	10	0	0	10	3
CIP 380241.17	30	5	5	40	13
CIP 676070	30	0	0	30	10
CIP 573275	2	1	0	3	1
IGOROTA (cv)	10	0	8	18	6
GANZA (cv)	0	1	0	1	1
GRANOLA (cv)	0	45	0	45	15
TOTAL	107	77	58	242	10

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F 0.05	TABULATED F 0.01
Block	2	152.583	76.292			
Treatment	7	2221.167	317.310	1.70^{ns}	2.77	4.28
Error	14	2606.083	186.149			
TOTAL	23	4906.833				

^{ns} =Not significant

Coefficient of Variation (%) =24.31

Appendix table 3d. Canopy cover at 75 DAP

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	25	21	40	86	29
Phil. 5.19.2.2	13	0	0	13	4
CIP 380241.17	21	0	0	21	7
CIP 676070	11	0	0	11	4
CIP 573275	0	0	0	0	0
IGOROTA (cv)	2	0	0	2	1
GANZA (cv)	0	0	0	0	0
GRANOLA (cv)	0	0	0	0	0
TOTAL	72	21	40	133	6

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	166.083	83.02			
Treatment	7	1973.292	281.899	7.52**	2.77	4.28
Error	14	524.583	37.470			
TOTAL	23	2663.958				

** =Highly significant   Coefficient of Variation (%) =29.02

Appendix table 4a. Initial Plant height at 30 DAP (cm)

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	1370.5	701.4	1470	3541.9	1180.6
Phil. 5.19.2.2	1540	1420	1010	3970	1323.3
CIP 380241.17	2330.5	2270	2020	6620.5	2206.8
CIP 676070	1460	941	1290	3691	1230.3
CIP 573275	1540	1420	1010	3970	1323.3
IGOROTA (cv)	1560	860.4	910.5	3330.9	1110.3
GANZA (cv)	420	110	730	1260	420
GRANOLA (cv)	1220.5	710	770	2700.5	900.2
TOTAL	11002	7982.8	9290.5	28275.3	1178.1

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	573119.990	2886559.995			
Treatment	7	5262612.800	751801.829	13.36**	2.77	4.28
Error	14	788038.288	56288.449			
TOTAL	23	6623771.077				

** =Highly significant Coefficient of Variation (%) =20.14

Appendix table 4 b. Final Height at 75 DAP (cm)

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	4025	3522	4111	11658	3886
Phil. 5.19.2.2	0	0	0	0	0
CIP 380241.17	0	0	0	0	0
CIP 676070	1565	0	1197.5	2762.5	920.8
CIP 573275	0	0	760	760	253.3
IGOROTA (cv)	1065	0	1331	2396	798.7
GANZA (cv)	0	0	0	0	0
GRANOLA (cv)	0	0	0	0	0
TOTAL	6655	3522	7399.5	17576.5	732.4

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	1058540.646	529270.333			
Treatment	7	37080705.740	5297243.6777	39.86**	2.77	4.28
Error	14	1860577.854	1322898.418			
TOTAL	23	3999924.854				

** =Highly significant   Coefficient of Variation (%) =26.12

Appendix table 5a. Late blight incidence at 30 DAP

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	1	1	1	3	1
Phil. 5.19.2.2	2	2	2	6	2
CIP 380241.17	2	1	1	4	1
CIP 676070	1	2	1	4	1
CIP 573275	1	1	1	3	1
IGOROTA (cv)	1	2	2	5	2
GANZA (cv)	2	1	1	4	1
GRANOLA (cv)	1	1	1	3	1
TOTAL	11	11	10	32	1.0

Appendix table 5b. Late blight incidence at 45 DAP

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	2	2	2	6	2
Phil. 5.19.2.2	4	7	6	17	6
CIP 380241.17	4	6	6	16	5
CIP 676070	4	5	6	15	5
CIP 573275	5	6	6	17	6
IGOROTA (cv)	4	5	6	15	5
GANZA (cv)	9	7	5	21	7
GRANOLA (cv)	5	6	6	17	6
TOTAL	37	44	43	124	5

Appendix table 5c. Late blight incidence at 60 DAP

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	3	3	3	9	3
Phil. 5.19.2.2	8	9	9	26	9
CIP 380241.17	6	6	7	19	6
CIP 676070	6	8	8	22	7
CIP 573275	8	8	9	25	8
IGOROTA (cv)	6	7	8	21	7
GANZA (cv)	9	8	9	26	9
GRANOLA (cv)	9	9	9	27	9
TOTAL	55	58	62	175	7

Appendix table 5d. Late blight incidence at 75 DAP

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	5	5	5	15	5
Phil. 5.19.2.2	9	9	9	27	9
CIP 380241.17	8	7	8	23	8
CIP 676070	8	9	9	26	9
CIP 573275	9	9	9	27	9
IGOROTA (cv)	7	7	8	22	7
GANZA (cv)	9	9	9	27	9
GRANOLA (cv)	9	9	9	27	9
TOTAL	64	64	66	194	8

Appendix table 6a. Leaf miner incidence at 30 DAP

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	1	1	1	3	1
Phil. 5.19.2.2	1	1	1	3	1
CIP 380241.17	1	1	1	3	1
CIP 676070	1	1	1	3	1
CIP 573275	1	1	1	3	1
IGOROTA (cv)	1	1	1	3	1
GANZA (cv)	1	1	1	3	1
GRANOLA (cv)	1	1	1	3	1
TOTAL	8	8	8	24	1

Appendix table 6b. Leaf miner incidence at 45 DAP

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	1	1	1	3	1
Phil. 5.19.2.2	1	1	1	3	1
CIP 380241.17	1	1	1	3	1
CIP 676070	1	1	1	3	1
CIP 573275	1	1	1	3	1
IGOROTA (cv)	1	1	1	3	1
GANZA (cv)	1	1	1	3	1
GRANOLA (cv)	1	1	1	3	1
TOTAL	8	8	8	24	1

Appendix table 6c. Leaf miner incidence at 60 DAP

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	1	1	1	3	1
Phil. 5.19.2.2	1	1	1	3	1
CIP 380241.17	1	1	1	3	1
CIP 676070	1	1	1	3	1
CIP 573275	1	1	1	3	1
IGOROTA (cv)	1	1	1	3	1
GANZA (cv)	1	1	1	3	1
GRANOLA (cv)	1	1	1	3	1
TOTAL	8	8	8	24	1

Appendix table 6d. Leaf miner incidence at 75 DAP

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	1	1	1	3	1
Phil. 5.19.2.2	1	1	1	3	1
CIP 380241.17	1	1	1	3	1
CIP 676070	1	1	1	3	1
CIP 573275	1	1	1	3	1
IGOROTA (cv)	1	1	1	3	1
GANZA (cv)	1	1	1	3	1
GRANOLA (cv)	1	1	1	3	1
TOTAL	8	8	8	24	1

Appendix table 7a. Bacterial wilt incidence at 30 DAP

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	1	1	1	3	1
Phil. 5.19.2.2	1	1	1	3	1
CIP 380241.17	1	1	1	3	1
CIP 676070	1	1	1	3	1
CIP 573275	1	1	1	3	1
IGOROTA (cv)	1	1	1	3	1
GANZA (cv)	1	1	1	3	1
GRANOLA (cv)	1	1	1	3	1
TOTAL	8	8	8	24	1

Appendix table 7b. Bacterial wilt incidence at 45 DAP

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	1	1	1	3	1
Phil. 5.19.2.2	1	1	1	3	1
CIP 380241.17	1	1	1	3	1
CIP 676070	1	1	1	3	1
CIP 573275	1	1	1	3	1
IGOROTA (cv)	1	1	1	3	1
GANZA (cv)	1	1	1	3	1
GRANOLA (cv)	1	1	1	3	1
TOTAL	8	8	8	24	1

Appendix table 7c. Bacterial wilt incidence at 60 DAP

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	1	1	1	3	1
Phil. 5.19.2.2	1	1	1	3	1
CIP 380241.17	1	1	1	3	1
CIP 676070	1	1	1	3	1
CIP 573275	1	1	1	3	1
IGOROTA (cv)	1	1	1	3	1
GANZA (cv)	1	1	1	3	1
GRANOLA (cv)	1	1	1	3	1
TOTAL	8	8	8	24	1

Appendix table7d. Bacterial wilt incidence at 75 DAP

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	1	1	1	3	1
Phil. 5.19.2.2	1	1	1	3	1
CIP 380241.17	1	1	1	3	1
CIP 676070	1	1	1	3	1
CIP 573275	1	1	1	3	1
IGOROTA (cv)	1	1	1	3	1
GANZA (cv)	1	1	1	3	1
GRANOLA (cv)	1	1	1	3	1
TOTAL	8	8	8	24	1

Appendix table 8. Number of marketable tubers per plot

ENTRY	BLOCK I	BLOCK II	BLOCK III	TOTAL	MEAN
Phil. 2.21.6.2	68	136	261	465	155
Phil. 5.19.2.2	3	6	12	21	7
CIP 380241.17	14	27	51	92	31
CIP 676070	58	116	218	392	131
CIP 573275	19	38	76	133	44
IGOROTA (cv)	25	49	93	167	56
GANZA (cv)	0	0	0	0	0
GRANOLA (cv)	18	36	70	124	41
TOTAL	205	408	781	1394	9

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F 0.05	TABULATED F 0.01
Block	2	30079.750	15039.875			
Treatment	7	87914.500	12559.214	2.77*	2.77	4.28
Error	14	36280.250	2591.446			
TOTAL	23	154274.500				

*=Significant Coefficient of Variation (%) =20.07

Appendix table 9. Number of non-marketable tubers per plot

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	73	36	61	170	113
Phil. 5.19.2.2	7	4	4	15	10
CIP 380241.17	17	13	16	46	31
CIP 676070	32	11	17	60	40
CIP 573275	10	29	25	64	43
IGOROTA (cv)	24	23	21	68	45
GANZA (cv)	0	15	7	22	15
GRANOLA (cv)	31	19	24	74	49
TOTAL	194	150	175	519	22

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	121.750	60.875			
Treatment	7	5283.625	754.804	8.59**	2.77	4.28
Error	14	1236.250	87.875			
TOTAL	23	6635.625				

**= Highly significant Coefficient of Variation (%) =23.70

Appendix table 10. Weight of marketable tubers per plot (kg)

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	1.700	2.950	5.650	10.300	3.433
Phil. 5.19.2.2	.300	.500	.950	1.750	.583
CIP 380241.17	1.050	1.850	3.600	6.500	2.167
CIP 676070	.650	1.250	2.400	4.300	1.433
CIP 573275	.400	.700	1.300	2.400	.800
IGOROTA (cv)	.600	1.100	2.100	3.800	1.267
GANZA (cv)	0	0	0	0	0
GRANOLA (cv)	.380	.700	1.320	2.400	.800
TOTAL	5.080	9.050	17.320	31.450	1310

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	9.800	7.900			
Treatment	7	24.041	3.434	8.54**	2.77	4.28
Error	14	5.632	0.402			
TOTAL	23	39.473				

**= Highly significant Coefficient of Variation (%) =10.31

Appendix table 11. Weight of non-marketable tubers per plot (kg)

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	0.190	0.050	0.240	0.480	0.160
Phil. 5.19.2.2	0.020	0.010	0.010	0.040	0.013
CIP 380241.17	0.050	0.050	0.020	0.120	0.040
CIP 676070	0.150	0.020	0.020	0.190	0.063
CIP 573275	0.020	0.040	0.040	0.100	0.033
IGOROTA (cv)	0.050	0.040	0.040	0.130	0.043
GANZA (cv)	0	0.050	0.020	0.070	0.023
GRANOLA (cv)	0.020	0.040	0.050	0.110	0.037
TOTAL	0.500	0.300	0.440	1.240	0.052

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	0.003	0.001			
Treatment	7	0.045	0.006	2.91*	2.77	4.28
Error	14	0.031	0.002			
TOTAL	23	0.078				

*=Significant Coefficient of Variation (%) =4

Appendix table 12. Total yield per plot (kg)

ENTRY	BLOCK			TOTAL	MEAN
	I	II	III		
Phil. 2.21.6.2	1.890	3.000	5.890	10.780	3.593
Phil. 5.19.2.2	.320	.510	.960	1.790	.597
CIP 380241.17	1.100	1.900	3.620	6.620	2.207
CIP 676070	.800	1.270	2.420	4.490	1.497
CIP 573275	.420	.740	1.340	2.500	.833
IGOROTA (cv)	.650	1.140	2.140	3.930	1.310
GANZA (cv)	0	0.050	0.020	0.070	0.023
GRANOLA (cv)	.400	.740	1.370	2.510	.837
TOTAL	5.580	9.350	17.760	32.690	1.362

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F	
					0.05	0.01
Block	2	9.721	4.860			
Treatment	7	25.939	3.706	8.94**	2.77	4.28
Error	14	5.805	0.415			
TOTAL	23	41.464				

**= Highly significant

Coefficient of Variation (%) =15.76

Appendix Table 13. Computed yield tons per hectare

ENTRY	BLOCK I	BLOCK II	BLOCK III	TOTAL	MEAN
Phil. 2.21.6.2	3.78	6	11.78	21.56	7.19
Phil. 5.19.2.2	0.64	1.02	1.92	3.58	1.19
CIP 380241.17	2.2	3.8	7.24	13.24	4.41
CIP 676070	1.6	2.54	4.84	8.98	2.99
CIP 573275	0.84	1.48	2.68	5	1.67
IGOROTA (cv)	1.3	2.28	4.28	7.86	2.62
GANZA (cv)	0	0.1	0.04	0.14	0.05
GRANOLA (cv)	0.8	1.48	2.74	5.02	1.67
TOTAL	11.16	18.7	35.52	65.38	2.7

ANALYSIS OF VARIANCE

	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARE	COMPUTED F	TABULATED F 0.05	TABULATED F 0.01
Block	2	39.572	19.786			
Treatment	7	105.553	15.079	8.65**	2.77	4.28
Error	14	24.392	1.742			
TOTAL	23	169.517				

**= Highly significant   Coefficient of Variation (%`