

BIBLIOGRAPHY

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ABSTRACT

Seven carrot cultivars were evaluated as to their growth and yield performance to determine the best variety for Nabalicong, Natubleng, Buguias, Benguet condition.

Results showed that Sigma and Golden State had the longest leaves. However, Golden State, Kuroda Improved, and Mushashino were harvested earlier at 105 days. Among the varieties evaluated, Mushashino significantly produced the longest root while Mushashino and Teracota had the widest roots. Kuroda Improved, Sigma, Golden State had the heaviest big roots while Golden State had the heaviest medium roots. Golden State, New Kuroda Guson, Kuroda Improved, Sigma had the least number of forked roots, while Kuroda Improved, New Kuroda Guson, Sigma, Golden State, Mushashino had the least number of cracked roots.

Golden State, Sigma, Mushashino, Kuroda Improved significantly had the highest marketable yield at 100.00, 94.50, 94.00, 90.00, t/ha, respectively. Moreover, the highest return on investment was obtained from Golden State at 136.54%, followed by Kuroda Improved at 115.16%, and Mushashino at 110.27%.



RESULTS AND DISCUSSION

Leaf Length at Harvest

Sigma and Golden State variety significantly had the longest leaves while New Kuroda Guson had the shortest leaves. (Table 1).

There were no significant differences observed on the number of days to harvest. However, Kuroda Improved and Mushashino were harvested earlier at 105 days as shown in Table 1.

Table 1. Leaf length at harvest and number of days to harvest.

VARIETY	LEAF LENGTH AT HARVEST (cm)	DAYS TO HARVEST
New Kuroda Guson (Check)	48.88 ^c	110.00 ^a
Kuroda Improved (Check)	58.90 ^b	105.00 ^a
Sigma	65.48 ^a	115.00 ^a
Golden State	65.08 ^a	112.00 ^a
KS- Kuroda	59.28 ^b	115.00 ^a
Mushashino	59.50 ^b	105.00 ^a
Teracota	60.20 ^b	110.00 ^a

In a column means with the same letter are not significantly different at 5 % by DMRT



Root Length and Root Diameter

Table 2 showed that Mushashino variety significantly produced longest roots with a mean of 16.25 cm while KS- Kuroda produced the shortest roots. Moreover, Mushashino and Teracota variety significantly produced widest diameter of roots with a mean of 4.38 cm and 4.52cm while New Kuroda Guson and New Kuroda Improved had the smaller root diameter (Table 2).

Table 2. Root length and root diameter

VARIETY	ROOT(cm)	
	LENGTH	DIAMETER
New Kuroda Guson (Check)	10.95 ^{de}	3.47 ^c
Kuroda Improved (Check)	12.63 ^{cde}	3.49 ^c
Sigma	13.00 ^{bcd}	3.90 ^{bc}
Golden State	14.90 ^{ab}	4.11 ^{ab}
KS- Kuroda	10.78 ^e	3.77 ^{bc}
Mushashino	16.25 ^a	4.38 ^a
Teracota	13.90 ^{bc}	4.52 ^a

In a column means with the same letter are not significantly different at 5 % by DMRT



Total Number of Roots

There were no significant differences observed on the total number of roots. Nevertheless, Golden State variety had the highest total number of roots with a mean of 278.25 pcs. while the rest are comparable to each other as shown in table 3.

Table 3. Total number of roots

VARIETY	MEAN
New Kuroda Guson (Check)	277.00 ^a
Kuroda Improved (Check)	276.75 ^a
Sigma	277.75 ^a
Golden State	278.25 ^a
KS- Kuroda	274.75 ^a
Mushashino	277.00 ^a
Teracota	277.00 ^a

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



Weight of Big, Medium, and Small Roots

Table 4 show's that Kuroda Improved, Sigma and Golden State varieties significantly produced the heaviest big roots comparable to the big roots of New Kuroda Guson but significantly higher than the big roots of other variety.

Among the variety Golden State had the heaviest medium roots comparable to Mushashino and Teracota but significantly higher among the varieties (Table 4).

No significant differences were observed on the weight of small roots. However, Mushashino had the heaviest small roots (Table 4).

Table 4. Weight of roots

VARIETY	CLASSIFICATION OF ROOTS		
	BIG (kg)	MEDIUM (kg)	SMALL (kg)
New Kuroda Guson (Check)	28.00 ^{ab}	9.25 ^{bc}	3.75 ^a
Kuroda Improved (Check)	28.50 ^a	10.00 ^{abc}	3.50 ^a
Sigma	31.75 ^a	8.50 ^{cd}	3.00 ^a
Golden State	31.00 ^a	11.25 ^a	3.25 ^a
KS- Kuroda	19.00 ^{bc}	7.25 ^d	2.75 ^a
Mushashino	26.50 ^{abc}	10.50 ^{ab}	5.00 ^a
Teracota	17.50 ^c	10.75 ^{ab}	3.75 ^a

In a column means with the same letter are not significantly different at 5 % by DMRT



Number and Weight of Forked and Cracked Roots

Table 5 showed that, KS- Kuroda variety significantly had the highest number and heaviest weight of forked with a mean of 97.50 pcs and 15.25kg compared to the other varieties.

Teracota significantly had the highest number and heavy cracked roots with a mean of 59.75 pcs and 8.25kg (Table 5).

Table 5. Number and weight of forked and cracked roots

VARIETY	FORKED ROOTS		CRACKED ROOTS	
	NUMBER (pcs)	WEIGHT (kg)	NUMBER (pcs)	WEIGHT (kg)
New Kuroda Guson (Check)	13.25 ^c	12.75 ^{bc}	5.25 ^c	2.75 ^b
Kuroda Improved (Check)	13.75 ^c	20.50 ^c	4.50 ^c	3.50 ^b
Sigma	13.75 ^c	18.25 ^{bc}	5.25 ^c	3.75 ^b
Golden State	9.75 ^c	19.00 ^{bc}	5.00 ^c	4.50 ^b
KS- Kuroda	97.50 ^a	35.00 ^b	15.25 ^a	5.75 ^b
Mushashino	15.00 ^c	24.75 ^{bc}	5.75 ^c	5.00 ^b
Teracota	61.25 ^b	59.75 ^a	10.00 ^b	8.25 ^a

In a column means with the same letter are not significantly different at 5 % by DMRT



Weight of Marketable and Non-Marketable Roots, Total Yield and Computed Yield

Table 6 shows that Golden State, Sigma, Mushashino, Kuroda Improved and New Kuroda Guson varieties had significantly higher marketable yield over KS- Kuroda. Non-marketable yield was significantly higher in KS- Kuroda and Teracota while total yield was not significantly different among the varieties evaluated. All the varieties except New Kuroda Guson, Teracota, and KS- Kuroda had significantly higher computed marketable yield ranging 91-100 t/ha.

Table 6. Weight of marketable and non-marketable roots, total root weight and computed yield

VARIETY	ROOT WEIGHT (kg/ 1 x 5m plot)			COMPUTED YIELD (t/ha)
	MARKETABLE	NON-MARKETABLE	TOTAL YIELD	
New Kuroda Guson (Check)	44.25 ^{ab}	4.25 ^b	48.50 ^a	88.50 ^b
Kuroda Improved (Check)	45.50 ^a	4.50 ^b	50.00 ^a	90.00 ^a
Sigma	47.25 ^a	5.00 ^b	52.25 ^a	94.50 ^a
Golden State	50.25 ^a	4.75 ^b	55.00 ^a	100.00 ^a
KS- Kuroda	35.25 ^c	14.75 ^a	50.00 ^a	70.50 ^c
Mushashino	47.00 ^a	5.75 ^b	52.75 ^a	94.00 ^a
Teracota	37.25 ^{bc}	13.00 ^a	50.25 ^a	74.50 ^b

In a column means with the same letter are not significantly different at 5 % by DMRT



Average Root Weight

No significant difference was observed on the average weight of roots. Nevertheless, Sigma, Golden State, KS- Kuroda, and Mushashino varieties had heaviest roots.

Skin and Flesh Color

No significant differences were observed. However, New Koruda Guson, Sigma, KS- Kuroda, and Teracota varieties obtained the color of light orange while Kuroda Improved (Check variety), Golden State and Mushashino had orange color on its skin and flesh.

Table 7. Average root weight

VARIETY	MEAN (kg)
New Kuroda Guson (Check)	0.17 ^a
Kuroda Improved (Check)	0.18 ^a
Sigma	0.19 ^a
Golden State	0.19 ^a
KS- Kuroda	0.19 ^a
Mushashino	0.19 ^a
Teracota	0.18 ^a

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



Reaction to Insect Pests and Diseases

There were no significant differences among the cultivars tested on the infestation of cutworm, Leaf miner and aphids while no infection of powdery mildew on all the cultivars.

Cost and Return Analysis

On the cost and return analysis Golden State had the highest income of 1303.39 pesos or 136.54% of the return on investment followed by Kuroda Improved Of 1103.64 pesos or 115% and Mushashino of 1049.89 pesos income or 110% of Return on investment as shown in table 10.

Table 8. Skin and flesh color

VARIETY	MEAN
New Kuroda Guson (Check)	1.00 ^a (Light orange)
Kuroda Improved (Check)	3.00 ^a (Dark orange)
Sigma	1.00 ^a (Light orange)
Golden State	3.00 ^a (Dark orange)
KS- Kuroda	1.00 ^a (Light orange)
Mushashino	3.00 ^a (Dark orange)
Teracota	1.00 ^a (Light orange)

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



Table 9. Reaction to insect pests and diseases

VARIETY	INSECT PESTS (APHIDS)	DISEASES (POWDERY MILDEW)
New Kuroda Guson (Check)	1.00 ^a	1.00 ^a
Kuroda Improved (Check)	1.25 ^a	1.00 ^a
Sigma	1.00 ^a	1.00 ^a
Golden State	1.00 ^a	1.00 ^a
KS- Kuroda	1.25 ^a	1.25 ^a
Mushashino	1.00 ^a	1.00 ^a
Teracota	1.25 ^a	1.00 ^a

In a column means with the same letter are not significantly different at 5 % by DMRT



Table 10. Cost and return analysis

ITEMS	VARIETIES							
	New Guson	Kuroda	Kuroda Improved	Sigma	Golden State	KS-Kuroda	Mushashino	Teracota
Marketable yield:								
Big	112kg	114kg	114kg	127kg	124kg	76kg	106kg	70kg
Medium	37kg	40kg	40kg	34kg	45kg	29kg	42kg	43kg
Lumpia	28	28	28	28	32	36	40	36
A. Sales								
Big x 15	1680	1710	1710	1905	1860	1140	1590	1050
medium x 6	222	240	240	204	270	174	252	258
lumpia x 4	112	112	112	112	128	144	160	144
Total sales	2014	2062	2062	2221	2258	1458	2002	1452
B. Expenses								
New Guson	43.5							
Kuroda Improved		30						
Sigma				147				
Golden State					26.25			
KS- Kuroda						84		
Mushashino							23.75	
Teracota								180
Insecticide	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Fungicide	30.86	30.86	30.86	30.86	30.86	30.86	30.86	30.86
Fertilizer:								
Chicken manure	67.86	67.86	67.86	67.86	67.86	67.86	67.86	67.86
Yara mila 16-16-16	66	66	66	66	66	66	66	66
Gibrellic acid	11.57	11.57	11.57	11.57	11.57	11.57	11.57	11.57
Borax	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Labor	334.29	334.29	334.29	334.29	334.29	334.29	334.29	334.29
Meal	171.43	171.43	171.43	171.43	171.43	171.43	171.43	171.43
Transportation	243.86	243.86	243.86	243.86	243.86	243.86	243.86	243.86
Total expenses	971.86	958.36	958.36	1075.36	954.61	1012.36	952.11	1108.36
Net profit	1042.14	1103.64	1103.64	1145.64	1303.39	445.64	1049.89	343.64
ROI(%)	107.231	115.159	115.159	106.535	136.536	44.0199	110.27	31.0044
RANK	4	2	2	5	1	6	3	7

Picture Presentation





Figure 1. Overview of the experiment field.



A. New KurudaGuson
(Check)



B. Kuruda Improved
(Check)



C. Sigma



D. Golden State



E. KS – Kuruda



F. Mushashino



G. Teracota

Figure 2. Sample roots of the carrot varieties.

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

There were seven cultivars evaluated at Nabalicong, Natubleng, Buguias, Benguet. The study was conducted to determine the growth and yield performance of the various carrot varieties and to ascertain the best adaptable carrot variety/ties under Nabalicong, Natubleng, Buguias, Benguet condition.

Results showed that Sigma and Golden State had the longest leaves. However, Golden State, Kuroda Improved, and Mushashino were harvested earlier at 105 days. Among the varieties evaluated, Mushashino significantly produced longest root while Mushashino and Teracota had the widest roots. Kuroda Improved, Sigma and Golden State had the heaviest big roots while Golden State had the heaviest medium roots.

There were no significant differences among the varieties in the total number of roots, weight of small roots, total root weight and average root weight.

Golden State, New Kuroda Guson, Kuroda Improved, Sigma, had the least number of forked roots, while Kuroda Improved, New Kuroda Guson, Sigma, Golden State, Mushashino had the least number of cracked roots.

Golden State, Sigma, Mushashino, Kuroda Improved significantly had the highest marketable yield at 100.00, 94.50, 94.00, 90.00, t/ha, respectively. Moreover, the highest return on investment was obtained from Golden State at 136.54%, followed by Kuroda Improved at 115.16%, and Mushashino at 110.27%.



Conclusion

Based on the result of the study, Kuroda Improved, Golden State, and Mushashino performed best in yield at Nabalicong, Natubleng, Buguias, Benguet from which return of investment was derived.

Recommendation

Carrot varieties Kuroda Improved, Golden State, and Mushashino are therefore recommended to Nabalicong, Natubleng, Buguias, Benguet. However, variety trials should continuously be undertaken.



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