

BIBLIOGRAPHY

LINGBANAN, OLIVER B. MARCH 2013. Advanced Yield Trial of Potential Strawberry Crosses under Bocao, Abiang, Atok, Benguet Condition.

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ABSTRACT

The study was conducted at Bocao, Abiang, Atok, Benguet from December 2011 to March 2012 to identify new cultivar introduction adapted to local conditions and evaluate the performance of selected lines suitable in the area.

Sweet Charlie, and strawberry variety crosses, namely, Fern x (Fern x Toyonoka), Fern x Festival, Toyonoka x (Fern x Toyonoka), Agsapa x BSU Pierre, Rosalinda x Toyonoka, Agsapa (Selva x Toyonoka), BSU Pierre (Sweet Charlie x Toyonoka) were evaluated in the study.

Results revealed that Sweet Charlie, Fern x (Fern x Toyonoka) and BSU Pierre (Sweet Charlie x Toyonoka) were the earliest to initiate flowering, the first to initiate fruit set and the first to harvest as compared to the other variety crosses. Agsapa x (Selva x Toyonoka) was noted to be more superior to Sweet Charlie in terms of total number and weight of strawberry fruits. On the other hand, Fern x (Fern x Toyonoka), Fern x Festival and Agsapa x BSU Pierre may be planted as an alternative strawberry variety crosses to Sweet Charlie in terms of number and weight of strawberry fruits.



RESULTS AND DISCUSSION

Number of Days From Planting to Flowering, Flowering to Fruit Set and Flowering to First Harvest

As shown in Table 1, Cultivar Sweet Charlie significantly flowered earlier from transplanting to flowering. However, the results showed that the flowering of Sweet Charlie (check variety) was comparable to Fern x (Fern x Toyonoka), BSU Pierre (Sweet Charlie x Toyonoka), and Agsapa (Selva x Toyonoka), while Toyonoka x (Fern x Toyonoka) and Agsapa x BSU Pierre significantly required more days from transplanting to flowering.

Results showed that, Cultivar Sweet Charlie (check variety) significantly flowered earlier and had earlier fruit setting. The results from that cultivar Sweet Charlie was also comparable to that of Fern x (Fern x Toyonoka), Fern x Festival and BSU Pierre (Sweet Charlie x Toyonoka), while Toyonoka x (Fern x Toyonoka), Agsapa (Selva x Toyonoka), Agsapa x BSU Pierre, and Rosalinda x Toyonoka required more days from flowering to fruit set.

Sweet Charlie significantly had earlier days from flowering to first harvest. Results showed that Cultivar Sweet Charlie (check variety) was also comparable to Fern x (Fern x Toyonoka), and BSU Pierre (Sweet Charlie x Toyonoka), while Toyonoka x (Fern x Toyonoka) and Agsapa x BSU Pierre required more days from flowering to first harvest (Table 1).



Table 1. Number of days from planting to flowering, flowering to fruit set and flowering to first harvest.

VARIETY	DAYS FROM TRANS- PLANTING TO FLOWERING	DAYS FROM FLOWERING TO FRUIT SET	DAYS FROM FLOWERING TO FIRST HARVEST
Sweet Charlie (Check Variety)	14.00--	5.00--	47.00--
Fern x (Fern x Toyonoka)	14.00 ^{ns}	5.00 ^{ns}	47.00 ^{ns}
Fern x Festival	16.67 ^{ns}	5.67 ^{ns}	49.67 ^{ns}
Toyonoka x (Fern x Toyonoka)	19.33 ^{**}	6.33 ^{**}	52.33 ^{**}
Agsapa x BSU Pierre	22.00 ^{**}	7.00 ^{**}	55.00 ^{**}
Rosalinda x Toyonoka	16.67 ^{ns}	7.33 ^{**}	49.67 ^{ns}
Agsapa x (Selva x Toyonoka)	15.33 ^{ns}	6.33 ^{**}	48.33 ^{ns}
BSU Pierre (Sweet Charlie x Toyonoka)	14.00 ^{ns}	6.00 [*]	47.00 ^{ns}

Within the column means are subjected to Least Significant Difference (LSD) Test
 **- highly significant; *-significant; ^{ns}- not significant



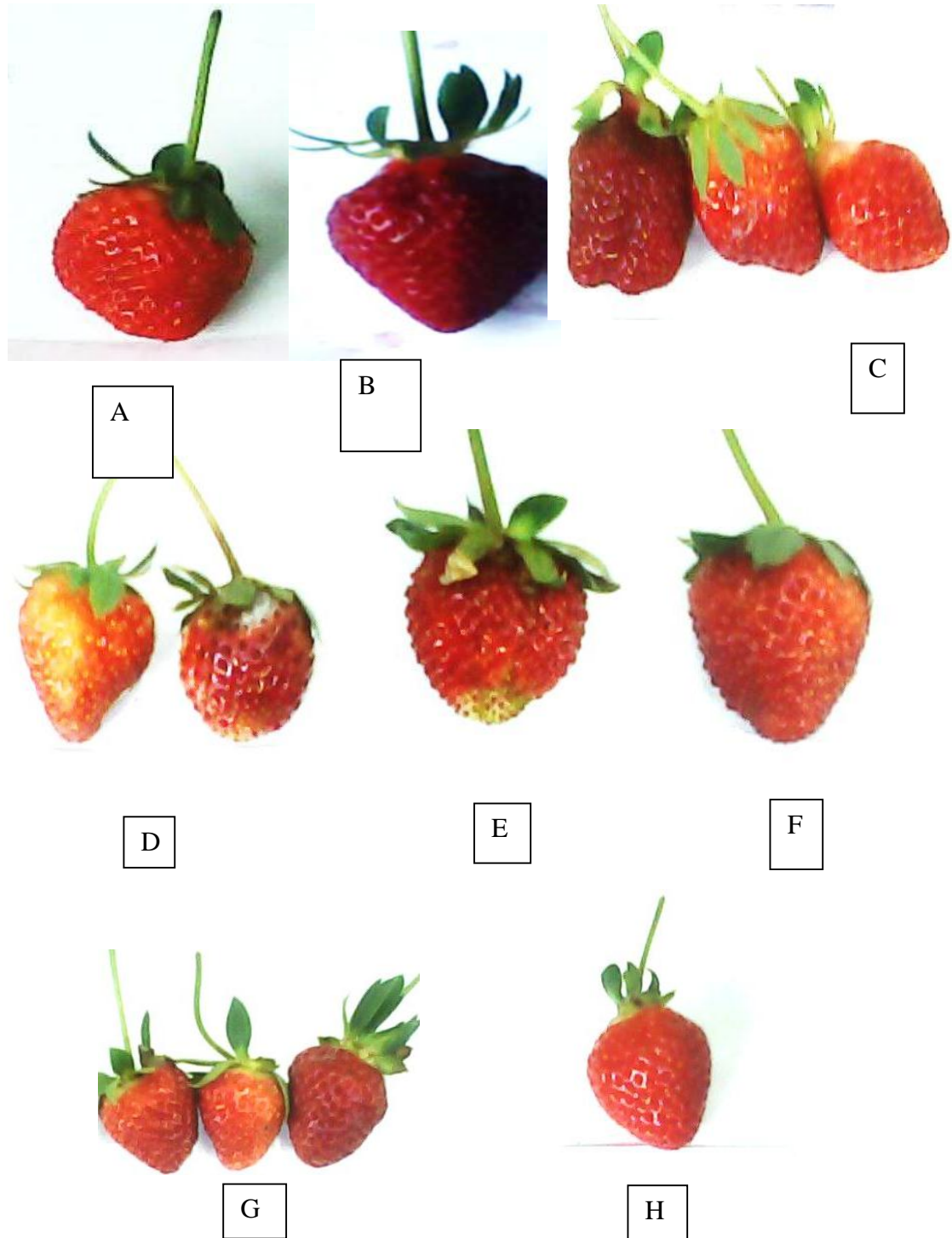


Figure 3. Sample Strawberry Fruits from Sweet Charlie (Check variety) (A), Fern x (Fern x Toyonoka) (B), Fernx Festival (C), Toyonoka x (Fernx Toyonoka) (D), Agsapa x BSU Pierre (E), Rosalinda x Toyonoka (F), Agsapa (Selva x Toyonoka) (G), BSU Pierre (Sweet Charlie x Toyonoka) (H).

Yield and Yield Components

Total number of marketable fruits. Table 2 showed that Sweet Charlie (check variety) with a mean of 144.67 fruits per 1x5m plot was comparable to Fern x Festival and Agsapa x BSU Pierre with means of 168.67 and 129.67, while Agsapa (Selva x Toyonoka) is significantly more superior to the check variety (Sweet Charlie).

Total number of non-marketable fruits. Sweet Charlie (check variety) with a mean of 132.00 fruits per 1x5m plot was comparable to Fern x Festival, Agsapa (Selva x Toyonoka) and Fern x (Fern x Toyonoka) with means of 148.33, 136.33 and 127.00 fruits per 1x5m plot, while Agsapa x BSU Pierre with mean of 165.67 fruits per 1x5m plot significantly more superior to the check variety (Sweet Charlie).

Table 2. Total number of marketable and non-marketable strawberry fruits.

VARIETY	NUMBER OF MARKETABLE FRUITS	NUMBER OF NON-MARKETABLE FRUITS
Sweet Charlie (Check variety)	144.67--	132.00--
Fern x (Fern x Toyonoka)	101.33**	127.00 ^{ns}
Fern x Festival	168.67 ^{ns}	148.33 ^{ns}
Toyonoka x (Fern x Toyonoka)	52.33**	68.00**
Agsapa x BSU Pierre	129.67 ^{ns}	165.67*
Rosalinda x Toyonoka	75.33**	101.00*
Agsapa (Selva x Toyonoka)	173.00*	136.33 ^{ns}
BSU Pierre (Sweet Charlie x Toyonoka)	90.67**	92.67*

Within the column means are subjected to Least Significant Difference (LSD) Test
**- highly significant; *-significant; ^{ns}- not significant



Weight of marketable strawberry fruits (g). Table 3 showed that, Agsapa x (Selva x Toyonoka) significantly produced more heavier marketable strawberry fruits with a mean of 1937.83g, while Fern x Festival produced heavier marketable as compared to the Sweet Charlie (check variety).

Weight of non-marketable fruits(g). The variety crosses were comparable to Sweet Charlie (check variety) except for Toyonoka x (Fern x Toyonoka) which significantly produced lower non-marketable strawberry fruits with a mean of (620.67g).

Total yield (g). Fern x Festival cultivar with a mean of 3265.33 fruits per 1x5m plot was significantly more superior to Sweet Charlie (check variety) with mean of 2497.83 fruits, while the rest of the variety crosses were comparable to Sweet Charlie (check variety) except for Toyonoka x (Fern x Toyonoka) which significantly lower in total yield with a mean of 1522.33 fruits.



Table 3. Total marketable, non-marketable weight and total yield of strawberry fruits

VARIETY	WEIGHT OF MARKETABLE FRUITS(g)	WEIGHT OF NON-MARKETABLE FRUITS(g)	TOTAL YIELD (g) MEAN
Sweet Charlie(Checkvariety)	1486.17--	1011.67--	2497.83--
Fern x (Fern x Toyonoka)	1150.17 ^{ns}	1078.17 ^{ns}	2228.33 ^{ns}
Fern x Festival	1900.17 ^{ns}	1197.83 ^{ns}	3265.33*
Toyonoka x (Fern x Tonoka)	901.67*	620.67**	1522.33**
Agsapa x BSU Pierre	1292.00 ^{ns}	1192.17 ^{ns}	2484.17 ^{ns}
Rosalinda xToyonoka	1063.00*	785.67 ^{ns}	2338.00 ^{ns}
Agsapa (Selva x Toyonoka)	1937.83*	1032.83 ^{ns}	2970.67 ^{ns}
BSU Pierre(Sweet Charlie x Toyonoka)	1046.83*	802.83 ^{ns}	1849.67 ^{ns}

Within the column means are subjected to Least Significant Difference (LSD) Test
 **- highly significant; *-significant; ^{ns}- not significant



Sugar Content (°Brix) of Strawberry Fruits.

There were no significant differences observed on the sugar content of strawberry fruits. All of the crossed varieties had comparable (°Brix) sugar content with that of the check variety (Sweet Charlie).

Strawberry cultivars Toyonoka, Fern and Selva normally had the sweet taste, juicy and aromatic as characterized by Mr. Tagilan of King Louis Farm (HARRDEC- PARRFI, 1996).

Table 4. Sugar content (Brix) of strawberry fruits

VARIETY	MEAN (% Brix)
Sweet Charlie (Check variety)	8.47--
Fern (Fern x Toyonoka)	10.34 ^{ns}
Fern x Festival	8.56 ^{ns}
Toyonoka x (Fern x Toyonoka)	8.62 ^{ns}
Agsapa x BSU Pierre	8.92 ^{ns}
Rosalinda x Toyonoka	9.11 ^{ns}
Agsapa (Selva x Toyonoka)	9.01 ^{ns}
BSU Pierre (Sweet Charlie x Toyonoka)	10.00 ^{ns}

Within the column Means are subjected to Least Significant Difference (LSD) Test
**- highly significant; *-significant; ^{ns}- not significant



Table 5. Observed major insect pest (White Grabs).

VARIETY	VEGETATIVE STAGE	FLOWERING TO FRUITING STAGE	HARVESTING
Sweet Charlie (Check variety)	2	2	1
Fern (Fern x Toyonoka)	2	2	1
Fern x Festival	2	2	1
Toyonoka x (Fern x Toyonoka)	2	2	1
Agsapa x BSU Pierre	2	2	1
Rosalinda x Toyonoka	2	2	1
Agsapa (Selva x Toyonoka)	2	2	1
BSU Pierre (Sweet Charlie x Toyonoka)	2	2	1

<u>Rating</u>	<u>Description</u>
1	No infestation/infection
2	Moderate infestation/infection
3	Severe infestation/infection



Figure 4. Observed major insect pests (A) White grubs, (B) Symptoms of strawberry plants infested with white grubs

Table 6. Observed major disease (Gray Mold).

VARIETY	VEGETATIVE STAGE	FLOWERING TO FRUITING STAGE	HARVESTING
Sweet Charlie (Check variety)	1	1	3
Fern (Fern x Toyonoka)	1	1	3
Fern x Festival	1	1	3
Toyonoka x (Fern x Toyonoka)	1	1	3
Agsapa x BSU Pierre	1	1	3
Rosalinda x Toyonoka	1	1	3
Agsapa (Selva x Toyonoka)	1	1	3
BSU Pierre (Sweet Charlie x Toyonoka)	1	1	3

<u>Rating</u>	<u>Description</u>
1	No infestation/infection
2	Moderate infestation/infection
3	Severe infestation/infection

B



Figure 5. Observed major disease (A) and (B) Strawberry fruits infected with gray molds (*Botrytis cinerea*)

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

The study was conducted at Bocao, Abiang, Atok Benguet from December 2011 to March 2012, to identify new cultivar introduction adapted to the local conditions and to evaluate the performance of selected lines suitable in the area.

The earliest strawberry plants to initiate flowering, fruit set and flowering to first harvest were Sweet Charlie, Fern x (Fern x Toyonoka) and BSU Pierre (Sweet Charlie x Toyonoka). On the other hand, Agsapa x (Selva x Toyonoka), significantly produced more heavier weight of marketable strawberry fruits, while Fern x Festival produced heavier yield (total yield) as compared to Sweet Charlie (check variety).

As to percentage of sugar content ($^{\circ}$ Brix), all of the variety crosses were comparable to the check variety (Sweet Charlie).

Moderate infestations were observed from reproductive stage to vegetative stage and no infestation of white grubs was observed on the maturity/harvest stage of the strawberry plants, while no infection of gray molds was observed on the reproductive and vegetative stage of strawberry fruits and severe infection were observed on the maturity/harvest stage of strawberry fruits.



Conclusion

Based on the findings of the study, it is therefore concluded that Sweet Charlie, Fern x (Fern x Toyonoka) and BSU Pierre (Sweet Charlie x Toyonoka) were the earliest to initiate flowering, the first to initiate fruit set and the first to harvest as compared to the other variety crosses. Agsapa x (Selva x Toyonoka) was noted to be more superior to Sweet Charlie in terms of total number and weight of strawberry fruits. On the other hand, Fern x (Fern x Toyonoka), Fern x Festival and Agsapa x BSU Pierre may be planted as an alternative strawberry variety crosses to Sweet Charlie in terms of number and weight of strawberry fruits.

Recommendation

Based on the preceding results and discussions, Agsapa x (Selva x Toyonoka) is recommended to be grown under Bocao, Abiang, Atok, Benguet condition as it performs well in terms of number and weight of strawberry fruits.

Fern x Festival, Agsapa x BSU Pierre and Fern x (Fern x Toyonoka) are alternative strawberry variety crosses for Sweet Charlie in terms of number and weight of strawberry fruits.

Further study is also recommended in other locations for verification of the performance of the Strawberry to determine the suitable crosses in the area.



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