

BIBLIOGRAPHY

PEG-ED, JIMUEL P. OCTOBER 2012. Acclimatization of Tissue Cultured Banana Plantlets (*var. 'Lakatan'*) as Affected by Different Growing Media. Benguet State University, La Trinidad, Benguet.

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ABSTRACT

The study was conducted at the Ornamental Horticulture Area, Benguet State University, La Trinidad, Benguet from March 2012 to May 2012. The study was conducted to establish the best growing media to harden the rooted banana plantlets from *in vitro* before transplanting them to the field; and to evaluate the growth of banana plantlets from *in vitro* grown in different growing media and media compositions.

Results revealed that a medium of fern dust alone; and alnus compost + burnt rice hull+ fern dust+ Enrico Organic Growing media significantly promoted more vigorous plantlets and enhanced better growth and development of banana plantlets. Moreover plantlets grown in fern dust produced the longest roots and higher number of leaves per plant.

Furthermore, banana plantlets grown in the different growing media had no significant differences in terms of percentage survival, which was recorded 45 days after transplanting from the culture bottles.

In addition, fern dust alone; and alnus compost + burnt rice hull+ fern dust+ Enrico Organic growing media were found to be the best growing media in acclimatizing banana plantlets from *in vitro*.



RESULTS AND DISCUSSIONS

Plant Vigor

Table 1 shows the plant vigor of banana plantlets grown in different growing media after 45 days. Plantlets grown in sandy soil were significantly more vigorous with a mean rating of 2.33 but were not significantly different to those plantlets grown in garden soil + alnus compost (farmers practice), and in alnus compost only, burnt rice hull only, and Enrico Organic growing media. Moreover, plantlets grown in fern dust only and alnus compost + sand + burnt rice hull + fern dust + Enrico Organic Growing Media were the least vigorous.

Table 1. Plant vigor rating index of banana plantlets after 45 days from planting

TREATMENT	MEAN
Farmers practice (garden soil and alnus compost)	2.00 ^a
Alnus Compost	2.00 ^a
Sandy Soil	2.33 ^a
Burnt rice hull	2.00 ^a
Fern dust	1.00 ^b
Enrico Organic Growing Media	2.00 ^a
AC + S + BRH + FD + Enrico Organic Growing Media	1.00 ^b
CV (%)	12.39
%	

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



Plant Height

As presented in Table 2 banana plantlets grown in alnus compost + sand + burnt rice hull + fern dust + Enrico Organic Growing Media had significantly faster plant growth which was not significantly different with those of the plantlets grown in fern dust only as compared to the other growing media.

The presence of sand and burnt rice hull in the alnus compost media improved the physical properties of the medium resulting to better drainage and aeration leading to better plant growth performance (Dumaslan, M. 2006).

Table 2. Plant height of banana plantlets after 45 days from planting

TREATMENT (cm)	MEAN
Farmers practice (garden soil and alnus compost)	12.56 ^b
Alnus Compost	12.33 ^b
Sandy Soil	12.60 ^b
Burnt rice hull	14.03 ^b
Fern dust	26.33 ^a
Enrico Organic Growing Media	12.57 ^b
AC + S + BRH + FD + Enrico Organic Growing Media	28.23 ^a
CV (%)	
11.65%	

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



Root Length

Table 3. Shows that significant or differences were observed among the different growing media used. Banana plantlets grown in fern dust only with a mean of 30.70 cm produced the longest roots but were not significantly different with the root lengths obtained from banana plantlets grown in burnt rice hull only with a mean of 27.40 cm. Furthermore plantlets grown in Enrico Organic Growing Media alone produced the shortest roots, 45 days from transplanting from the culture bottle.

As previously mentioned the results collaborated with the earlier findings of Gawadan (1999) who found that a mixture of 1:1:1 alnus compost + rice hull + river sand had significantly promoted longer roots in banana plantlets.

Table 3. Root length of banana plantlets after 45 days from planting

TREATMENT (cm)	MEAN
Farmers practice (garden soil and alnus compost)	
16.77 ^{cde}	
Alnus Compost	15.07 ^{de}
Sandy Soil	22.80 ^{bc}
Burnt rice hull	27.40 ^{ab}
Fern dust	30.70 ^a
Enrico Organic Growing Media	13.00 ^e
AC + S + BRH + FD + Enrico Organic Growing Media	19.70 ^{cd}
CV (%)	
16.81%	

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



Number of Leaves

Table 4. Banana plantlets grown in fern dust only significantly produced more leaves with a mean of 5.33 after 45 days from transplanting from the cultured bottle; but were not significantly different from plantlets grown in Enrico Organic Growing Media only and alnus compost + mountain sand + burnt rice hull + fern dust +enrico growing mediawhich had a mean of 4.00.

On the other hand, Acop (1987) as cited by Daculan (2010) reported that a medium of 1:1:1 part of horse manure + garden soil + alnus compost produced the tallest plants with the highest leaf count at anthesis and promoted earlier of initiation flowers in chrysanthemum plantlets grown from *in vitro*.

Table 4. Number of leaves per plant of banana plantlets after 45 days from planting

TREATMENT	MEAN
Farmers practice (garden soil and alnus compost)	3.00 ^b
Alnus Compost	3.00 ^b
Sandy Soil	3.00 ^b
Burnt rice hull	3.00 ^b
Fern dust	5.33 ^a
Enrico Organic Growing Media	4.00 ^{ab}
AC + S + BRH + FD +Enrico Organic Growing Media	4.00 ^{ab}
CV (%)	
22.75%	

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



Percentage Survival

Banana plantlets grown in the different growing media did not show significant differences in percentage survival obtained 45 days after transplanting from the culture bottle as shown in Table 5.

Table 5. Percentage survival of banana plantlets after 45 days from planting

TREATMENT	MEAN
Farmers practice (garden soil and alnus compost)	100
Alnus Compost	100
Sandy Soil	100
Burnt rice hull	100
Fern dust	100
Enrico Organic Growing Media	100
AC + S + BRH + FD + Enrico Organic Growing Media	100
CV (%)	00.00%

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

Cost and Return Analysis

Table 6 shows that higher return on investment was obtained with the use of sand only followed by using burnt rice hull only and the farmers practice and alnus compost only.



Table 6. Cost and return analysis of banana plantlets

	TREATMENT						
	T1	T2	T3	T4	T5	T6	T7
Plantlets that survived (pcs.)	24	24	24	24	24	24	24
Gross income	480	480	480	480	480	480	480
Expenses							
Plantlets (P)	179	179	179	179	179	179	179
Growing media	30	30	10	20	50	75	100
Fungicide	20	20	20	20	20	20	20
Seedling box	30	30	30	30	30	30	30
Labor	20	20	20	20	20	20	20
Total expenses	279	279	259	269	299	324	349
Net income (P)	201	201	221	211	181	156	131
ROI (%)	72.04	72.04	82.16	78.44	60.53	48.15	37.54
Rank	3	3	1	2	4	5	6

Total sales per treatment were based at wholesale price of P 20.00 per piece.

Legend:

T ₁	Farmers Practice
T ₂	Alnus Compost
T ₃	Sandy Soil
T ₄	Burnt Rice Hull
T ₅	Fern Dust
T ₆	Enrico Organic Growing Media
T ₇	AC + MS + BRH + FD + Enrico Organic Growing Media (1:1:1:1:1)



Pictorial Presentation



Figure 1. Overview of the experimental area three weeks (21 days) after transplanting from the culture bottle

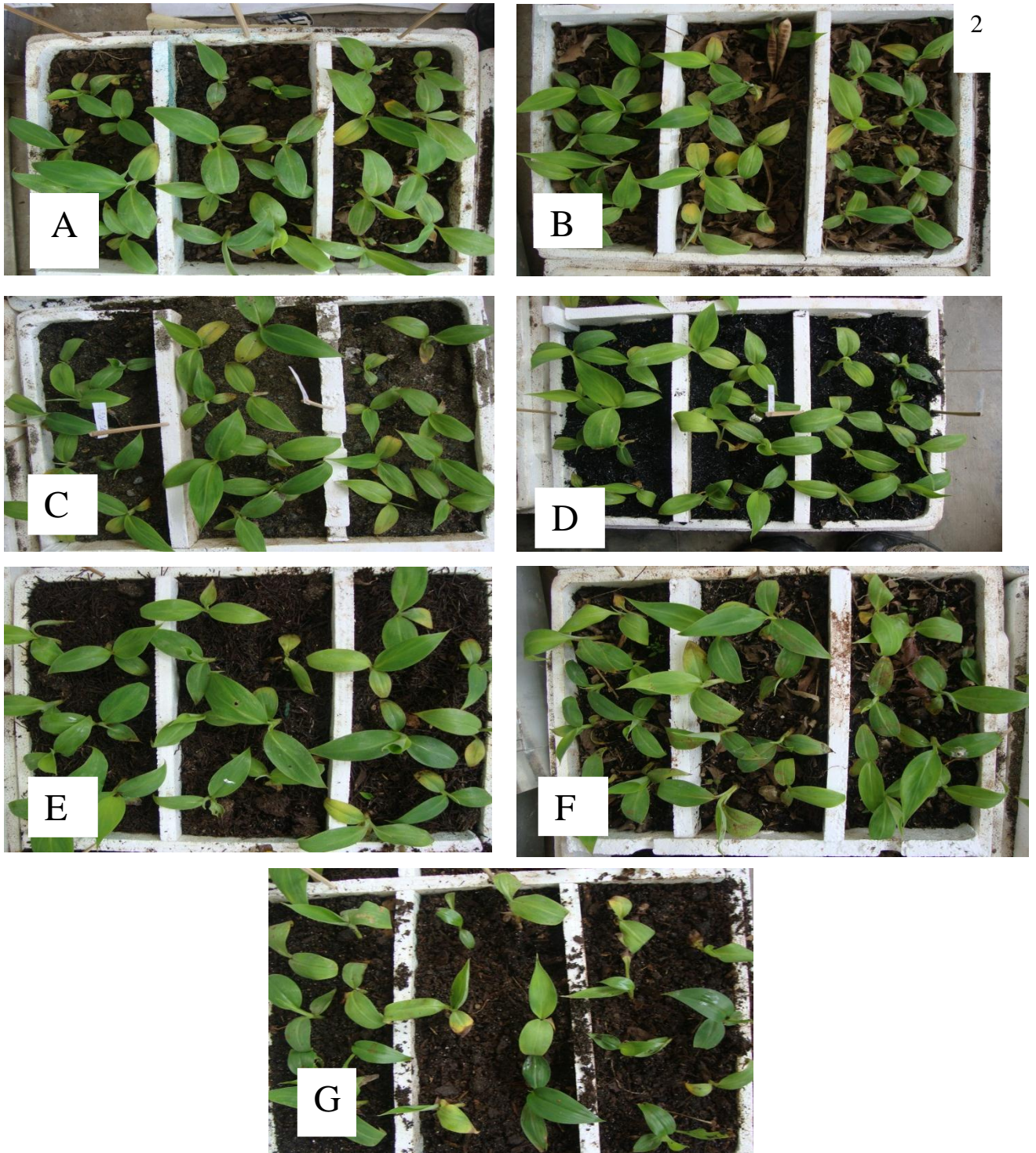


Figure 2. Banana plantlets grown in different growing media 21 days after transplanting from the culture bottle A-alnus compost+garden soil; B-alnus compost; C-sand; D-burnt rice hull; E-fern dust; F-commercial fertilizer; G- alnus compost+ sand+ burnt rice hull+ fern dust+ enrico organic growing media

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

The study was conducted at La Trinidad Benguet from March to May 2012 to establish the best growing media to harden the rooted banana plantlets from *in vitro* before transplanting them in the field; and to evaluate the growth of banana plantlets from *in vitro* grown in different growing media and media compositions.

A medium of fern dust only and alnus compost + sand+ burnt rice hull+ fern dust+ Enrico Organic Growing Media significantly promoted the growth of more vigorous plantlets and enhanced faster growth and development of banana plantlets grown *in vitro*. Moreover plantlets grown in fern dust only produced the longest roots and higher number leaves per plant. Furthermore banana plantlets grown in different growing media had no significant differences in terms of percentage survival, 45 days after transplanting from the culture bottles.

However, the highest return on investment was obtained with then use of sandy soil only followed by burnt rice hull only as growing medium.

Conclusion

Based on the results of the study, fern dust only and alnus compost + sand+ burnt rice hull+ fern dust+ Enrico Organic Growing Media were the best media in acclimatizing banana plantlets.



Recommendation

From the preceding results, acclimatizing banana plantlets in fern dust only for economic reasons and or in a composition of alnus compost + sand+ burnt rice hull+ fern dust+Enrico Organic Growing Mediais therefore recommended. It is further recommended that in acclimatizing banana plantlets the following steps should be followed:

- a.) Remove rooted tissue cultured plantlets from the culture bottle and wash with tap water to remove the gelling agent;
- b.) Soak plantlets in Previcure fungicide solution (2ml/li) for five minutes then were transplant in fern dust growing media;and,
- c.) Before transplanting, the growing media should be drenched with Previcure fungicide (2ml/li) to avoid unnecessary infection.



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