BIBLIOGRAPHY

MACLI-ING, JANETH P. APRIL 2012. Effect of Different Growing Media and Frequency of Misting on the Acclimatization of Chrysanthemum Plantlets *In Vitro*. 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 December 2011 to February 2012. The study was conducted to adapt the most appropriate soil media to harden rooted chrysanthemum plantlets before transplanting it to the field; to determine the frequency of misting that is appropriate in the acclimatization of chrysanthemum plantlets; and to establish the best condition of soil media and frequency of misting in the acclimatization of chrysanthemum plantlets.

Chrysanthemum plantlets grown in alnus compost + sand +burnt rice hull were the best growing media to promote growth and development in acclimatizing the plantlets. Likewise plantlets grown in alnus compost misted twice a day had the highest percentage survival.

Planting chrysanthemum plantlets in a composition of 1:1:1 ratio of alnus compost+ sand+ burnt rice hull is recommended and the seedlings should be misted once a day for one month to promote growth and development have a high percentage survival of the seedling.

RESULTS AND DISCUSION

Plant Height

Effect of growing media. Highly significant differences were observed among the different growing media used. Chrysanthemum plantlets grown in soil media containing alnus compost + sand + burnt rice hull (1:1:1) markedly promoted plant growth faster compared to other growing media.

Thompson and Troech (1978) added that the use of compost also resulted in humus formation and promotes good soil structure. Compost also supplies nutrients such as nitrogen, phosphorus (6%), calcium (13%), magnesium and organic matter content of 5.6%.

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 the better plant growth performance (Dumaslan, M. 2006).

As previously mentioned the results collaborate with the findings of Gawadan (1999) that a mixture of 1:1:1 alnus compost + rice hull + river sand had significantly promoted longer roots.

Effect of frequency of misting. There were no significant differences on the height of chrysanthemum plantlets as affected by misting (Table 1).

Interaction effect. Significant interaction effects were observed from the combination of different growing media and frequency of misting on the height of plantlets, one month from transplanting.

Plantlets grown in alnus compost + sand + burnt rice hull, misted once a day was the tallest compared to other treatments but were comparable to those planted in alnus compost +

sand + burnt rice hull, misted twice a day; garden soil + alnus compost, misted twice a day and alnus compost + sand + burnt rice hull, misted three times a day .

Table 1. Plant height

TREATMENT	MEAN (cm)
Growing Media	
Alnus Compost + Garden Soil	13.62[b]
Alnus Compost	9.41[c]
Sand	5[d]
Burnt Rice Hull	3.20[d]
Alnus Compost + Sand + Burnt Rice Hull (1:1:1)	18.46[a]
Frequency of Misting	
Once a day	9.0[a]
Twice a day	10.44[a]
Three times a day	10.29[a]
CV (%)	23.35

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

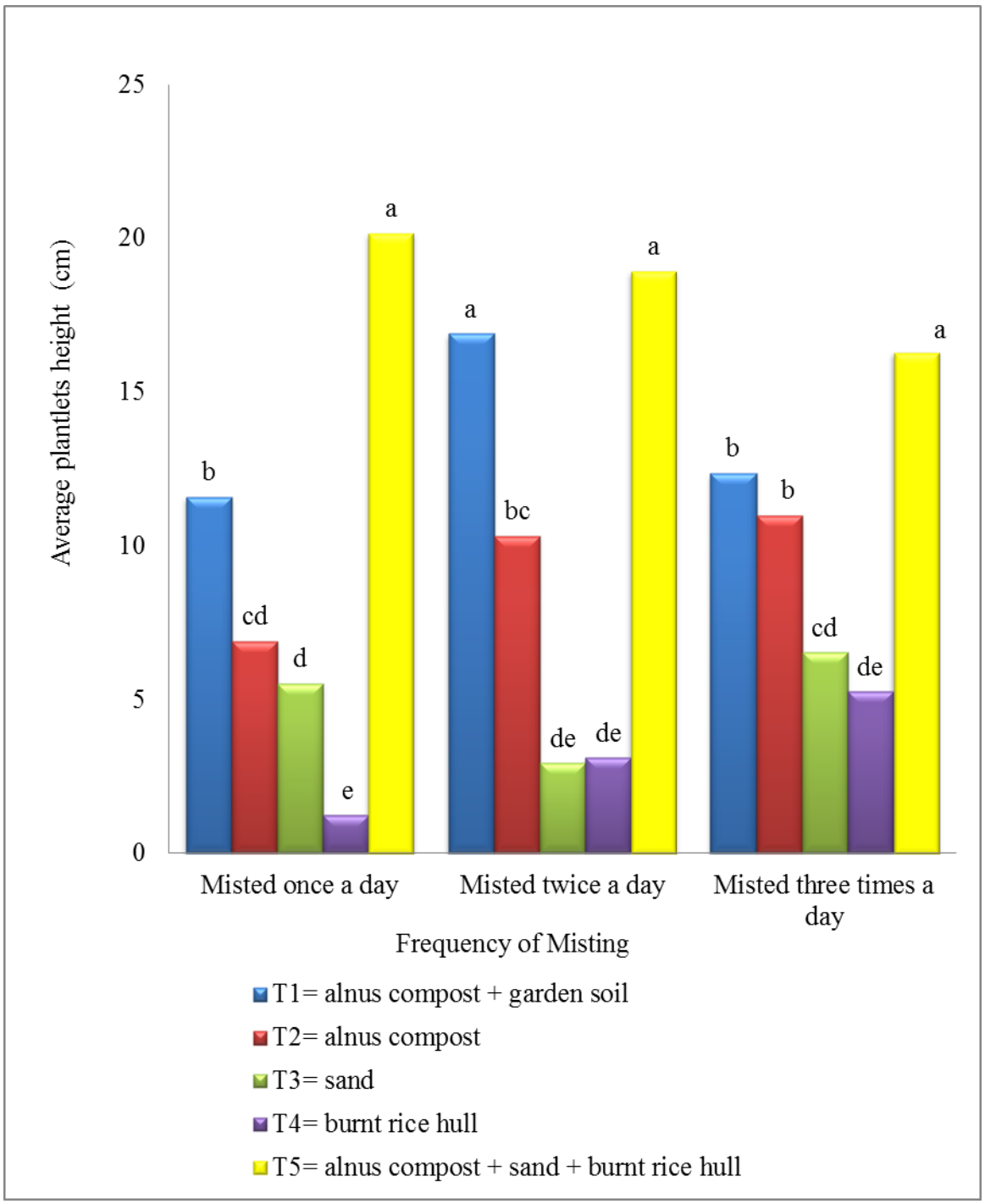

Figure 1. Average plant height as affected by different growing media and frequency of misting (Bars with the same letter are not significantly different at 5% level of DMRT)

Root Length

Effect of growing media. Plantlets grown in alnus compost + sand + burnt rice hull significantly produced longer roots but it was not significantly different to those plantlets grown in alnus compost and alnus compost + garden soil. Furthermore, plantlets grown in sand and burnt rice hull alone produced the shortest roots.

In the Handbook of Texas Green house Management, burnt rice hulls have a light weight but effective in improving drainage while sand do little to improve the physical properties of growing media that may result in reduced drainage and aeration as a result of compaction (Anon., 2006) as cited by Dumaslan M. (2006).

The above results agree with the earlier findings of Bisley (2008) that the seedlings from seeds sown in 1:1 alnus compost + garden soil had the longest root length.

Effect frequency of misting. The effect of different growing media and frequency of misting in the length of the roots in chrysanthemum plantlets was not significant.

Interaction effect. The interaction effect of the different growing media and frequency of misting on the root length of chrysanthemum plantlets were highly significant.

Plantlets grown in alnus compost+ sand + burnt rice hull, misted in different frequencies promoted the production of longer and more roots; but were not significantly different from those grown in garden soil + alnus compost and alnus compost, misted once a day; garden soil + alnus compost and alnus compost, misted twice a day; and garden soil + alnus compost, alnus compost and sand, misted three times a day.

Table 2. Root length

TREATMENT	MEAN (cm)
Growing Media	
Alnus Compost + Garden Soil	12.26[a]
Alnus Compost	12.80[a]
Sand	8.44[b]
Burnt Rice Hull	4.22[c]
Alnus Compost + Sand + Burnt Rice Hull 1:1:1)	14.06[a]
Frequency of Misting	
Once a day	10.12[a]
Twice a day	10.12[a]
Three times a day	10.83[a]
CV (%)	22.45

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

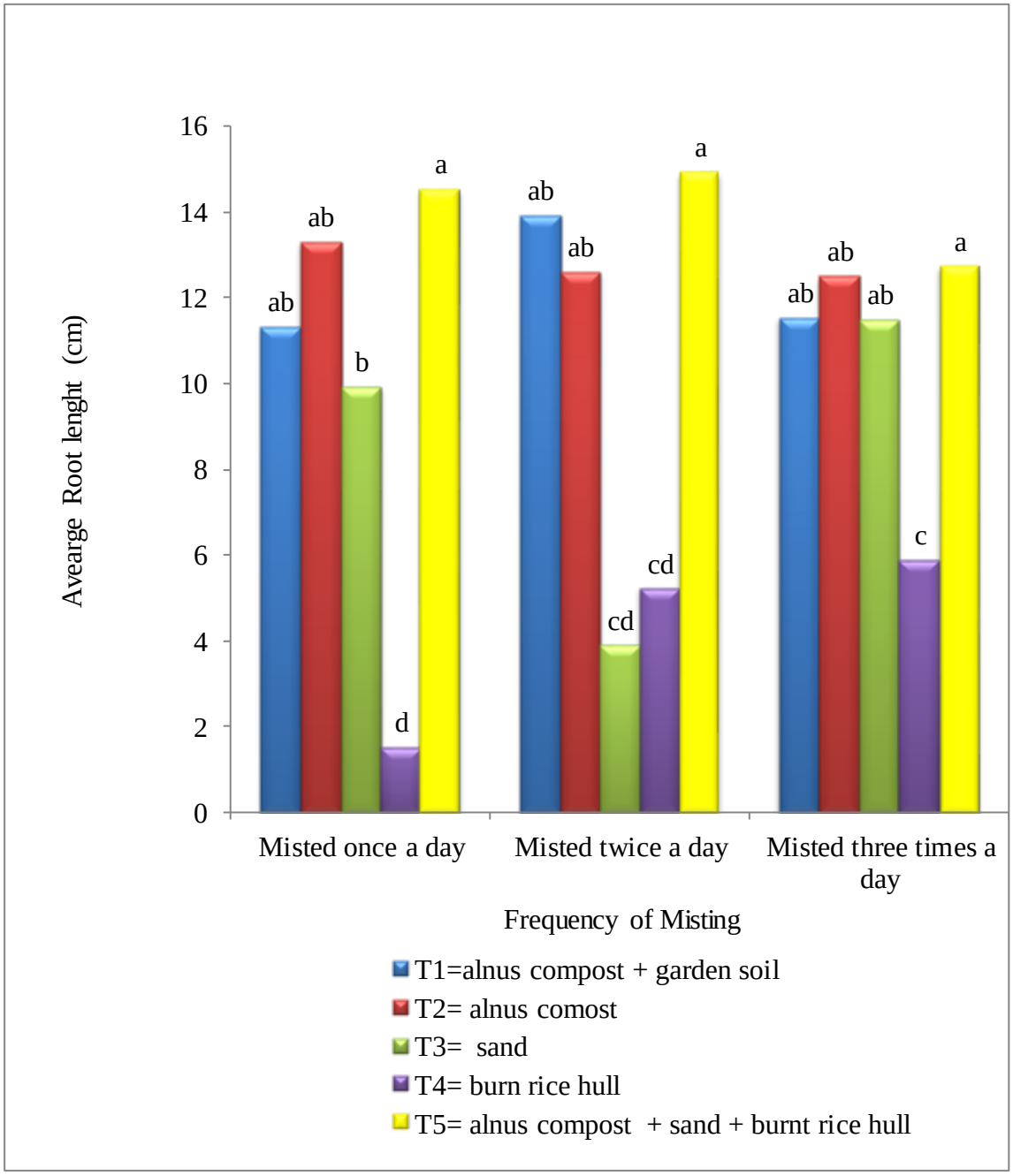

Figure 2. Average root length as affected by different growing media and frequency of misting (Bars with the same letter are not significantly different at 5% level of DMRT)

Number of Leaves

Effect of growing media. Plantlets grown in alnus compost + garden soil produced significantly more leaves with a mean of 22.00 but were not significantly different from plantlets grown in alnus compost and in alnus compost + sand + burnt rice hull.

Thompson and Troech (1978) added that the use of compost also resulted in humus formation and promotes good soil structure. Compost also supplies nutrients such as nitrogen, phosphorus (6%), calcium (13%), magnesium and organic matter content of 5.6%.

Effect of frequency of misting. There were no significant effects of the frequency of misting in the number of leaves produced per seedling/ plantlets one month from transplanting.

Interaction effect. The numbers of leaves of chrysanthemum plantlets were not significantly affected by interaction effects between the different growing media and frequency of misting.

Table 3. Number of leaves per plantlets

TREATMENT	MEAN
Growing Media	
Alnus Compost + Garden Soil	22.00[a]
Alnus Compost	20.11[ab]
Sand	14.66[bc]
Burnt Rice Hull	11.11[c]
Alnus Compost + Sand + Burnt Rice Hull (1:1:1)	18.667[ab]
Frequency of Misting	
Once a day	15.067[a]
Twice a day	17.66[a]
Three times a day	19.200[a]
CV (%)	32.87

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

Occurrence of Insect Pest and Diseases

Insect Infestation

There was slight insect infestation observed during the first week of this study. Results show that 25 % of the total plantlets grown in alnus compost + sand + burnt rice hull were infested by army worms as compared to other growing media. Severe rotting of plantlet roots was observed in chrysanthemum plantlets grown in burnt rice hull misted in different frequencies. There was no disease infection observed during the conduct of the study.

Percent Survival

Effect of growing media. Highly significant effects were observed on the percentage survival as affected by the different growing media. Results showed that plantlets grown in alnus compost had the highest percentage survival but was not significantly different from plantlets grown in alnus compost + sand + burnt rice hull; those grown in sand and alnus compost + garden soil. On the other hand, plantlets grown in burnt rice hull had the lowest percentage survival.

Effect of frequency of misting. Results revealed that the plantlets misted twice a day had the highest percentage of survival with a mean of 97.13 % but was not significantly different with plantlets misted three times a day.

Interaction effect. Significant interactions were observed between the different growing media and frequencies of misting on the percentage survival.

Results show that plantlets grown in alnus compost, sand, alnus compost + sand + burnt rice hull misted in different frequencies and plantlets grown in garden soil + alnus compost misted twice and three times day exhibited the highest plantlet survival.

Table 4. Percentage survival

TREATMENT	MEAN (%)
Growing Media	
Alnus Compost + Garden Soil	96.80[a]
Alnus Compost	100[a]
Sand	98.40[a]
Burnt Rice Hull	63.40[b]
Alnus Compost + Sand + Burnt Rice Hull (1:1:1)	98.40[a]
Frequency of Misting	
Once a day	83.80[b]
Twice a day	97.10[a]
Three times a day	93.30[a]
CV (%)	12.99

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

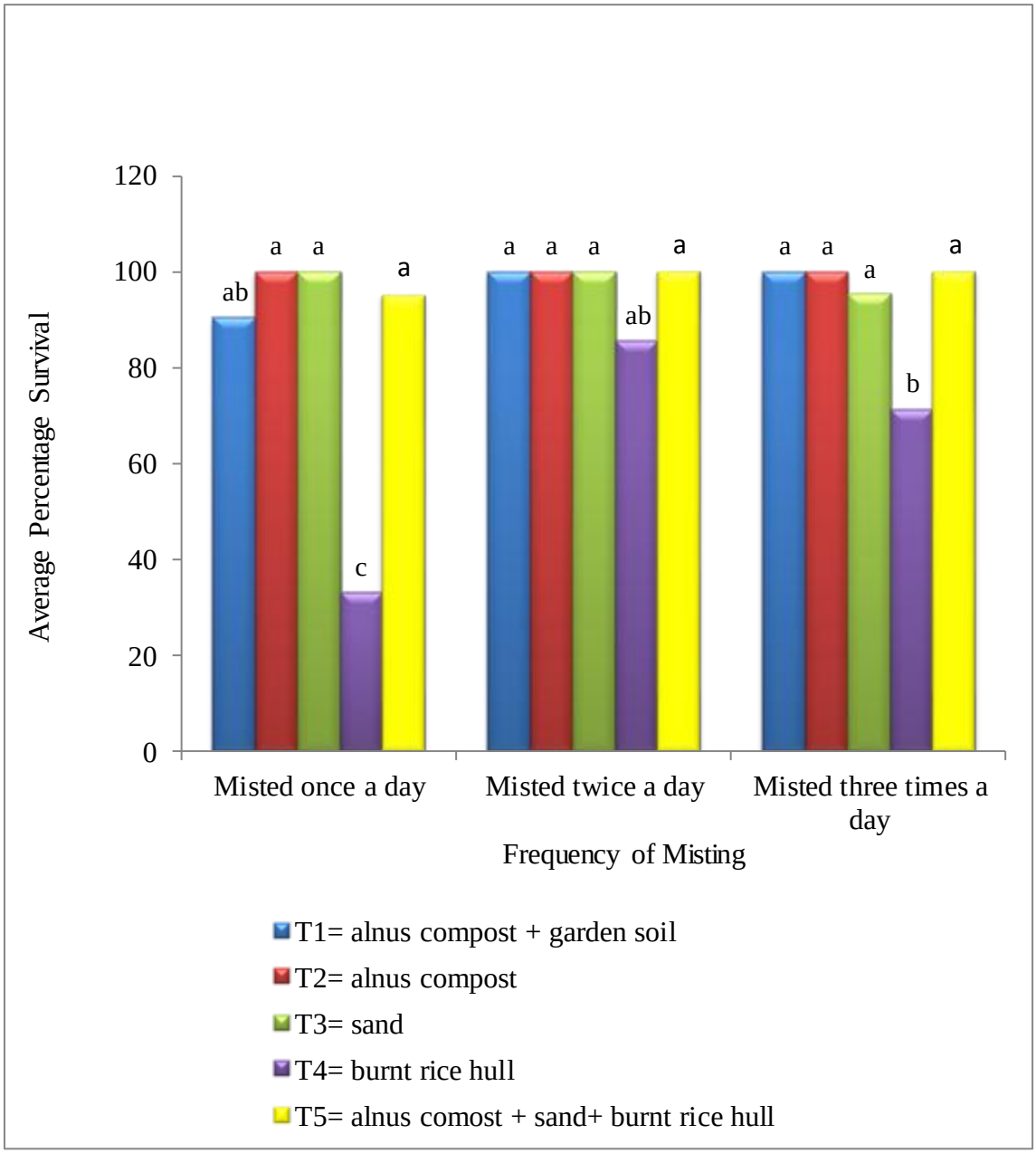

Figure 3. Average percentage survival of different growing media and frequency of misting (Bars with the same letter are not significantly different at 5% level of DMRT)

Other Observations

It is observed that the plantlets grown in burnt rice hull produced brownish roots; while plantlets grown in sand alone were stunted and exhibited nutrient deficiency symptoms.

It was observed that the roots of plantlets grown in burnt rice hull produced brownish color and this could be the effect of the toxic component present in the growing medium. Burnt rice hull is ash which contains potentially toxic levels of silicon which could plasmolized the roots of the acclimatized seedlings when planted in a longer period that lead to the rotting of the roots and exhibiting leaf yellowing. (Dumaslan, M. 2006).

Moreover, plantlets grown in sand alone had stunted growth that indicated nutrient deficiency symptom.

Plate 1. Overview of the experimental area

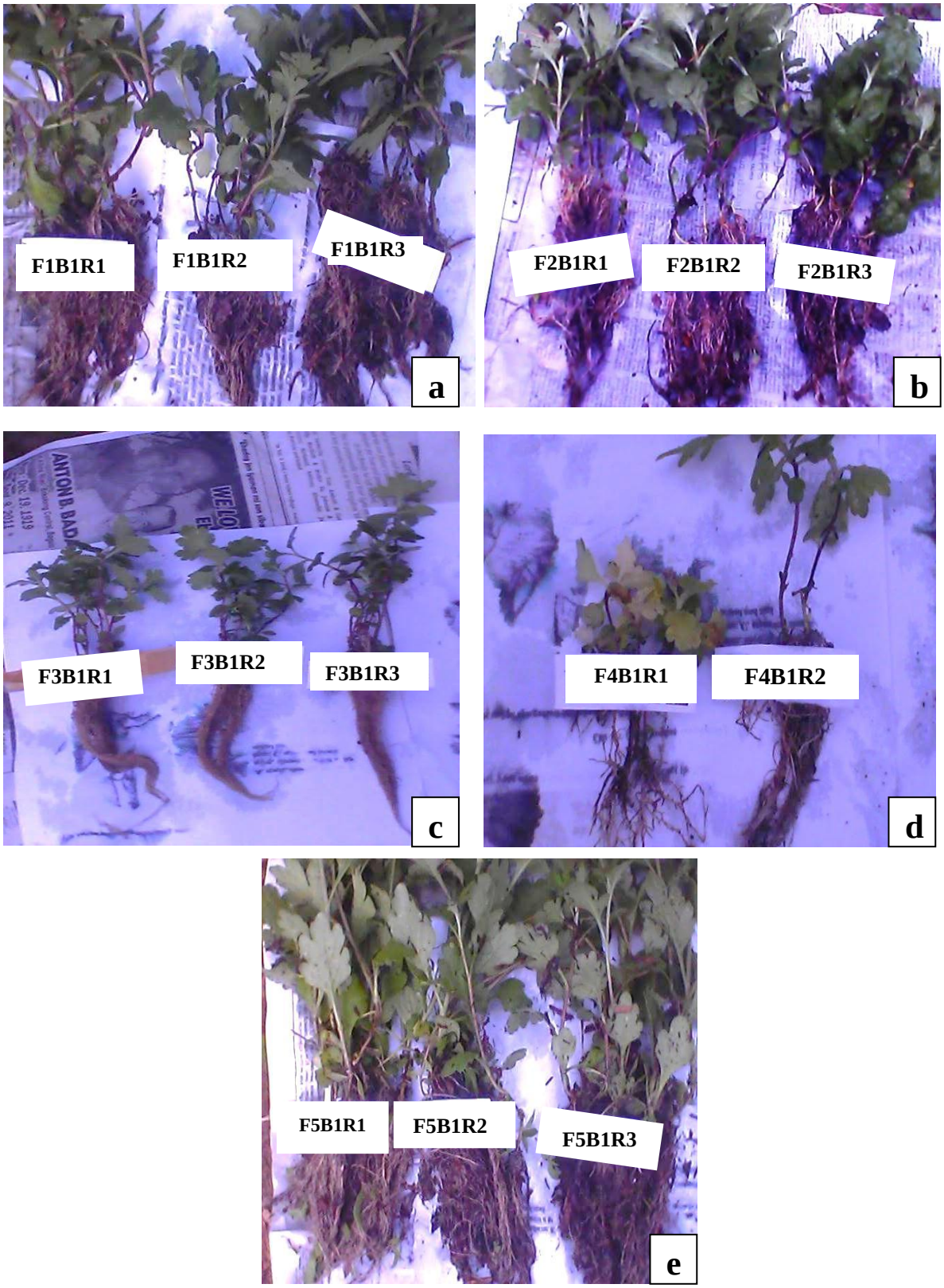

Plate 2. Uprooted plantlets in different growing media misted once a day (a= alnus compost + garden soil, b= alnus compost, c= sand, d= burnt rice hull, e= alnus compost + sand + burnt rice hull)

Plate 3. Uprooted plantlets in different growing media misted twice a day (a= alnus compost + garden soil, b= alnus compost, c= sand, d= burnt rice hull, e= alnus compost + sand + burnt rice hull)

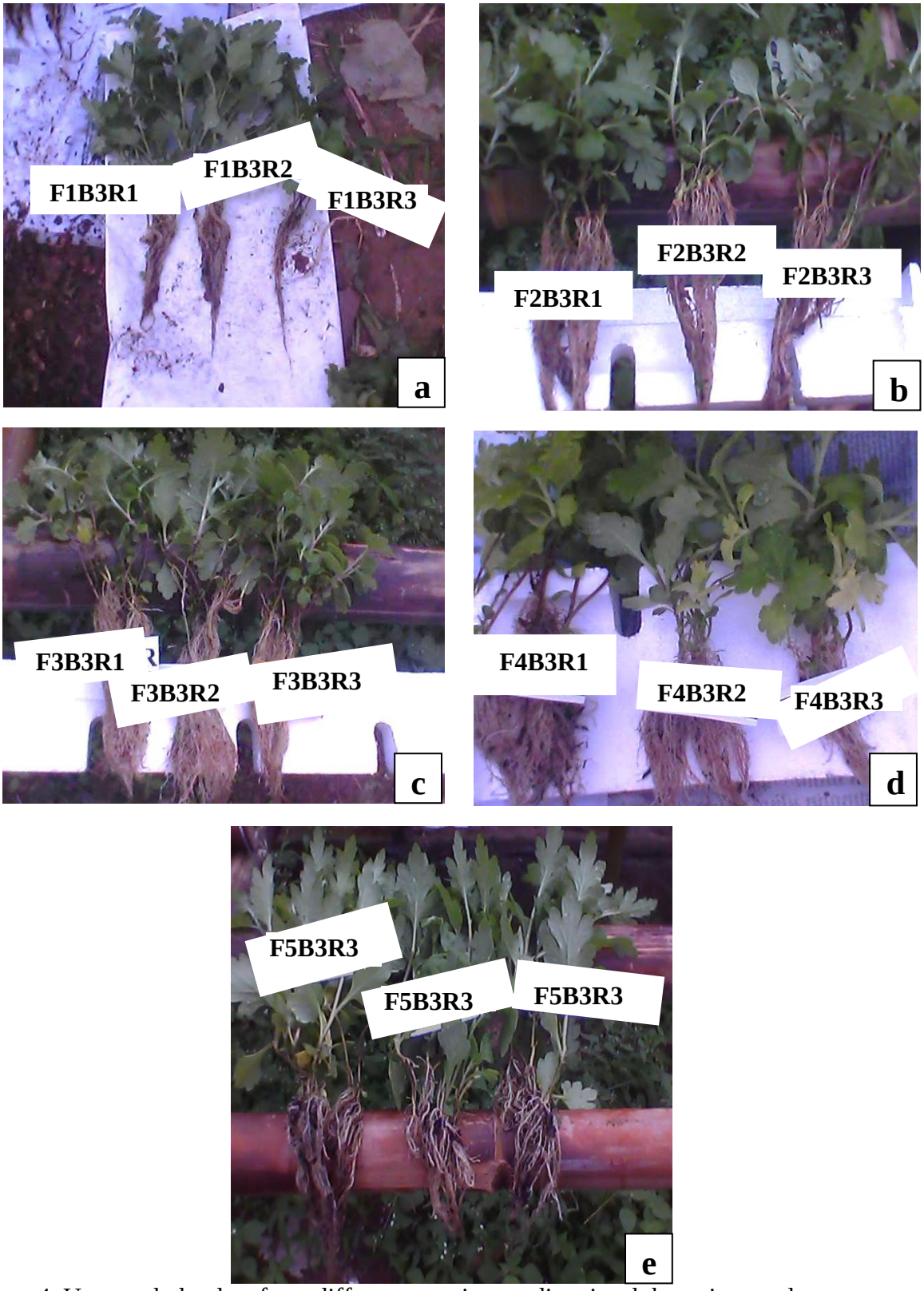

Plate 4. Uprooted plantlets from different growing media misted three times a day (a= alnus compost + garden soil, b= alnus compost, c= sand, d= burnt rice hull, e= alnus compost + sand + burnt rice hull)

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

The study was conducted to determine the most appropriate soil media to harden rooted chrysanthemum plantlets before transplanting to the field; to determine the frequency of misting that is appropriate in the acclimatization of chrysanthemum plantlets; and to establish the best condition of soil media and frequency of misting in the acclimatization of chrysanthemum plantlets.

A medium of alnus compost+ sand+ burnt rice hull, significantly promoted faster plantlet growth that remarkably produced longer roots. Moreover, plantlets grown in alnus compost + garden soil significant produced more leaves; plantlets grown in alnus compost alone had the highest percentage of plantlets survival.

Plantlets misted twice a day revealed a highest percentage of survival. There were no significant effects in the frequency of misting noted in plant height, root length and number of leaves produced.

Plantlets grown in alnus compost+ sand+ burnt rice hull, misted in different frequencies had the best plantlet growth and longer fibrous roots. Moreover, plantlets misted twice a day grown in alnus compost had the highest percentage of survival. There were no

significant interaction effects noted between the different growing media and frequency of misting on the number of leaves.

Conclusion

Based on the results of the study alnus compost + sand + burnt rice hull (1:1:1), once, twice and three times misting a day was the best combination in acclimatizing chrysanthemum plantlets.

Recommendation

From the preceding, results and discussion, acclimatizing chrysanthemum plantlets in a composition of 1:1:1 ratio of alnus compost+sand+ burnt rice hull and garden soil + alnus compost, misted once a day is recommended.

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