

RESEARCH REGARDING PLANT MATERIAL FORTIFICATION OBTAINED BY MICROPROPAGATION OF SOME CULTIVARS OF *SYRINGA VULGARIS* SPECIES

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Abstract

The study of fortification lilac plants obtained *in vitro* was achieved by organizing a bifactorial experience, factors influence was the genotype and culture substrate. Genotype was represented by two cultivars of *Syringa vulgaris* species: *Mme Lemoine* and *Sensation*. Two culture substrates were tested: mixture of manure, ground leaves, peat and sand (2:2:2:1) and peat Danmuld (pH = 5.5, particle size 0–20 mm). From the results recorded in the four years of experimentation, it is clear that the largest increases in plants height has registered *Mme Lemoine* cultivar, between 9.14 cm in the first year and 45.80, in the fourth year of fortification, the substrate composed of peat Danmuld. The capacity of suckers, better efficiency to registered cultivar *Sensation*, between 1.77 (first year) and 6.1 suckers/plant (fourth year), when grown on the substrate compound from a mixture of manure, ground leaves, peat and sand (2:2:2:1).

Keywords: container, *Mme Lemoine*, *Sensation*, substrate, suckers.

1. INTRODUCTION

Obtaining a plant material for planting in permanently place, in a short time, is one of the main objectives of horticulturalists. Therefore, concerns about improving the technology of *in vitro* propagation of some cultivars of *Syringa vulgaris* species were considered and increase in container propagating material obtained (Stănică et al, 2002). Considering the current trend towards containerized culture, we chose this method for fortifying plants obtained *in vitro*. *Syringa vulgaris* L., is a species wich develop the advantages of this technology: production does not depend on the nursery soil, the nutrition is controlled, delivering plant can be made throughout the year (Iliescu, 2005).

2. MATERIAL AND METHOD

Working methodology for two cultivars plant fortification studied, *Mme Lemoine* and *Sensation* obtained by micropropagation during the four years (2008-2012) was as follows:

Ist Year (2008 – 2009):

- plants of two cultivars of lilacs wich was performed *in vivo* rooting were removed, trimmed and planted in containers with a diameter of 9 cm;
- *in vitro* plants rooted which was performed acclimatization in alveolar pallets were planted with land bale without shaping the root system, in containers with a diameter of 9 cm;
- two substrates were used for culture:
 - mixture of manure, leaf soil, peat and sand (2:2:2:1), (Posedaru, 2003, Roșca, 2011);
 - peat Danmuld (pH 5.5, 0-20 mm grain size).
- planting in pots made in the first decade of march, they were labeled and placed in the greenhouse on the parapet, where they received care works following:

- watering was done manually whenever needed, and in very hot days (temperature over 35°C) was started sprinkler irrigation; for plant protection greenhouses were shaded;
- a preventive treatments were performed against diseases: *Phytophthora syringae*, *Albo-atrum Verticillium*, *Microsphaera syringae*, with Topsin 500 SC-0, 14% and curative, to combat common spider mite - *Tetranychus urticae* with Nissorun 70 WP - 0.04%;
- foliar fertilization was performed 2 times per month with Folimax Blue 20-20-20 + TE dose of 0.3%;
- mobilization of soil in pots to ensure good water and air permeability of the substrate;
- at the end of first year were made biometric measurements on the shoot length and the number of suckers;
- in winter, the plants were kept in a greenhouse (10-15°C).

IInd Year (2009 – 2010):

- at the beginning of march, the plants were transferred to containers with a diameter of 14 cm and were maintained further in the greenhouse where they received the same care works as in the first year;
- at the end of august, were performed biometric measurements on the shoot length and the number of suckers;
- in november, the containers were moved to the greenhouse plants cold, where the temperature never fell below -5°C, and after leaf fall, they were stratified into sawdust.

IIIrd Year (2010 – 2011):

- spring III, establishing the transfer of plants in containers with a diameter of 18 cm and were moved to the field;
- to ensure good drainage on the bottom of the pot to put a layer of gravel (7-15 mm grain size) of about 1.5 cm;
- The following care works:
 - watering was done through drip irrigation system;
 - weeding weeds and soil in pots mobilization was performed according to need;
 - fertilization was performed twice/month with special fertilizer to encourage flowering Folimax Blue 20-20-20 + TE dose of 0.3%;
 - pesticide treatments were performed preventive against diseases: bacterial fire - *Pseudomonas syringae*, *Phytophthora syringae*, *Microsphaera syringae* with Topsin 500 SC at a concentration of 0.14% and curative against aphids with Faster 10 EC, in concentration of 0.2%;
- at the end of august, biometric measurements were made on plant height and number of suckers;
- during the rest of the plant were detached suckers develop from buds on the roots, and planted in containers (Figure 1);
- before the transplantation, the roots were molded and drainage at the bottom of the pot to provide a layer of gravel, with a granule size 7-15 mm;
- plant transfer containers with a diameter of 23 cm (Figure 2);
- wintering containers occurred in field experimentation, stratified sawdust;
- plants reach the third year of the transition to container height over 35 cm and bushy, can be supplied in place permanently.



Figure 1. Aspects of suckers detaching from mother plant (A, B) and planting in containers of 12 and 14 cm (C), (original)

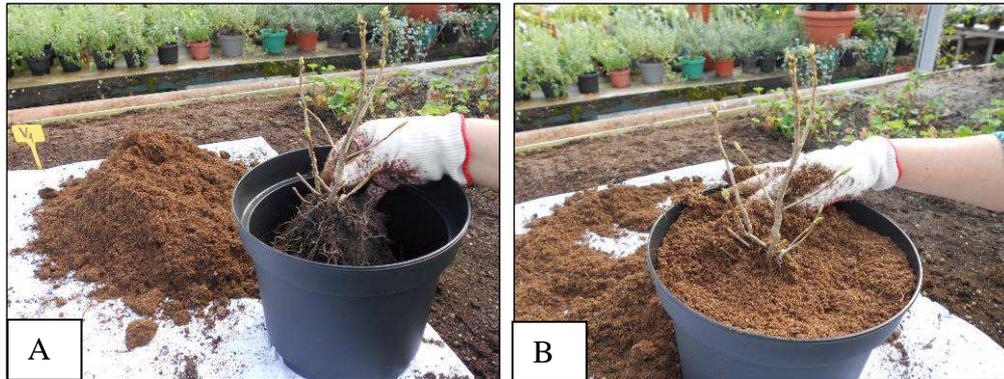


Figure 2. Lilac's potting in 23 cm diameter containers

IVth Year (2011 – 1012):

➤ in the spring of the fourth year, when the temperature reached higher values, was removed sawdust around the pots, and after re-vegetation works were performed the same care as in III;

- fortified plants in pots, may have the following purposes:
 - ✓ can be planted in landscaping;
 - ✓ transplanted from containers larger diameters;
 - ✓ planted in the ground of nurseries for different destinations (planting as solitary specimens, groups, massive hedges skirts).

In order to fortification lilac plants obtained *in vitro* were performed two experiments that were aimed at establishing the influence of culture substrate, quantifying the dynamics of plant growth (m) and the capacity of suckers (number of suckers/plant) within four years. Experience is bifactorial, type 2×2 , totaling 4 variants (Table 1).

Tabel 1. Experimental variants for fortification phase

Variants	VARIABLE FACTORS	
	A: Genotype	B: Culture substrate
V.1	A.1	B.1
V.2	A.1	B.2
V.3	A.2	B.1
V.4	A.2	B.2

Variable factors

A. Genotype, with two graduations:

- A.1 - *Syringa vulgaris* 'Mme Lemoine';
- A.2 - *Syringa vulgaris* 'Sensation'.

B. Culture substrates:

- B.1 - peat Danmuld;
- B.2 - mixture of manure, leaf soil, peat and sand (2:2:2:1);

3. RESULTS AND DISSCUSIONS

The results were recorded as the average of measurements made on 360 plants/experience and are summarized in table 2.

Table 2. Evolution of plant height and number of suckers/plant during the four years of fortification (2008-2012)

Experimental variants	I st Year		II nd Year		III rd Year		IV th Year	
	H (cm)	No suckers /plant	H (cm)	No. suckers /plant	H (cm)	No suckers /plant	H (cm)	Nr. suckers /plant
V1: A.1,B.1	9,14	0,35	21,70	1,50	33,90	2,20	45,80	2,90
V2: A.1,B.2	7,30	1,65	16,40	2,85	25,14	3,68	34,4	4,12
V3: A.2,B.1	6,90	1,25	15,65	2,15	24,15	3,40	35,75	5,20
V4: A.2,B.2	6,40	1,77	12,14	3,77	19,40	4,10	28,60	6,10

In the four years of experimentation, it is clear that plant height *Mme Lemoine* cultivar reached the highest values, ranging between 9.14 and 45.80 cm when grown in peat substrate Danmuld (B.1). On the same substrate, *Sensation*, recorded values ranging from 6.9 to 35.75 cm. The mixture of manure, ground leaves, peat and sand (2:2:2:1), (B.2) resulted in the average range from 7.3 to 34.4 cm *Mme Lemoine* and between 6.4 to 28 60 for the *Sensation*. Regarding suckers capacity substrate consisting of manure, ground leaves, peat and sand (2:2:2:1) induced an increase in the number of suckers/plant for both cultivars. Thus *Sensation* suckers get a number from 1.77 (in the first year) - 6.1 suckers / plant (in the fourth year), and *Mme Lemoine* between 1.65 suckers/plant after the first year of strengthening and 4.12 suckers/plant at the end of the fourth year of fortification.

Suckers separated in the third year of fortification during the rest of the plants were planted in containers of different sizes depending on the size suckers and made 100% grip. After a year of separation from the parent plant, plants thus obtained are capable of crossing the cold greenhouse conditions (Figure 3).

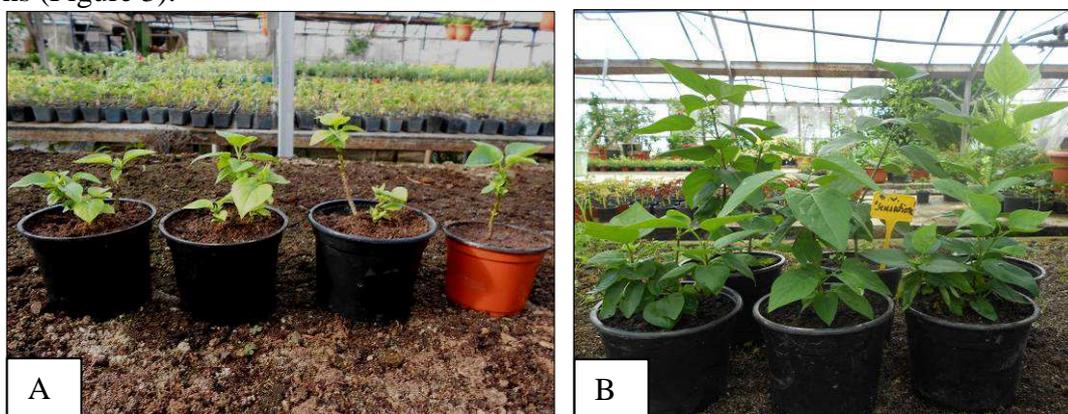


Figure 3. Suckers obtained from fortified potted plants: A- after three months from mother plant detachment; B - after six months from mother plant detachment (original)

The results obtained during the four years of fortification are well expressed by the correlation between plant height of both cultivars and growing media (Figure 4, 5, 6, 7).

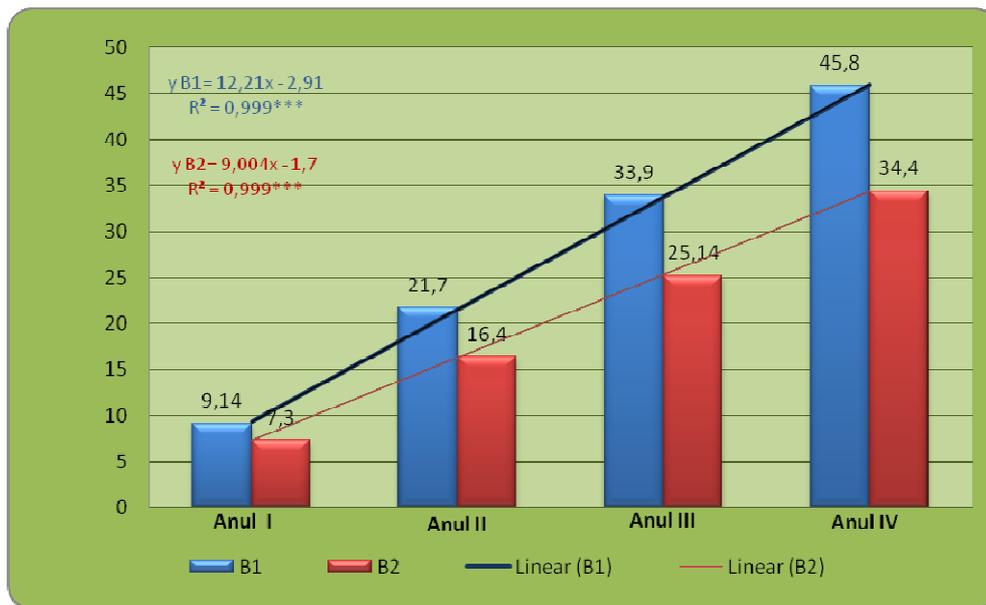


Figure 4. The correlation between plants height of Mme Lemoine cultivar and culture substrate, during four years

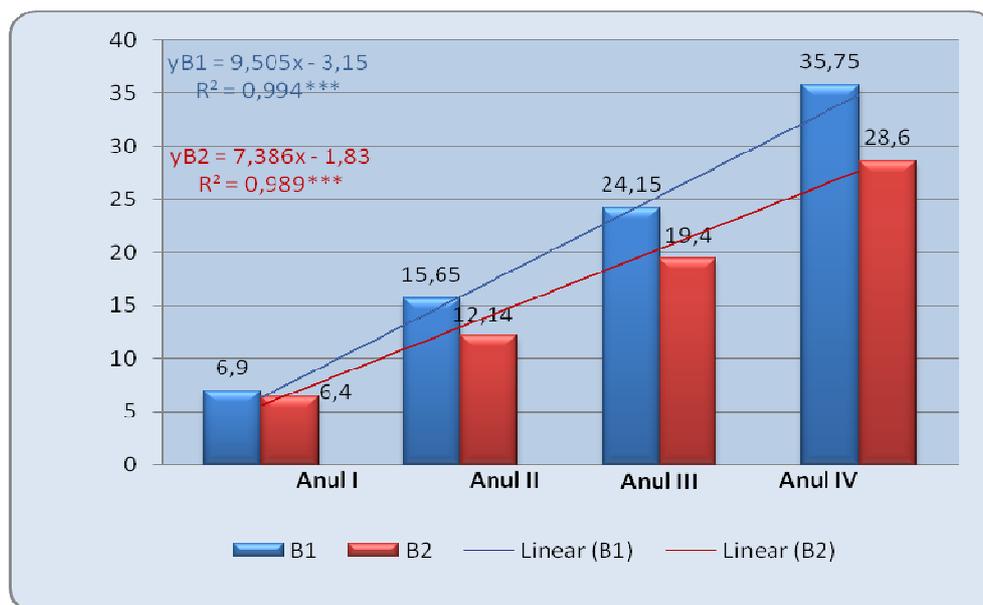


Figure 5. The correlation between plants height of Sensation cultivar and culture substrate, during four years

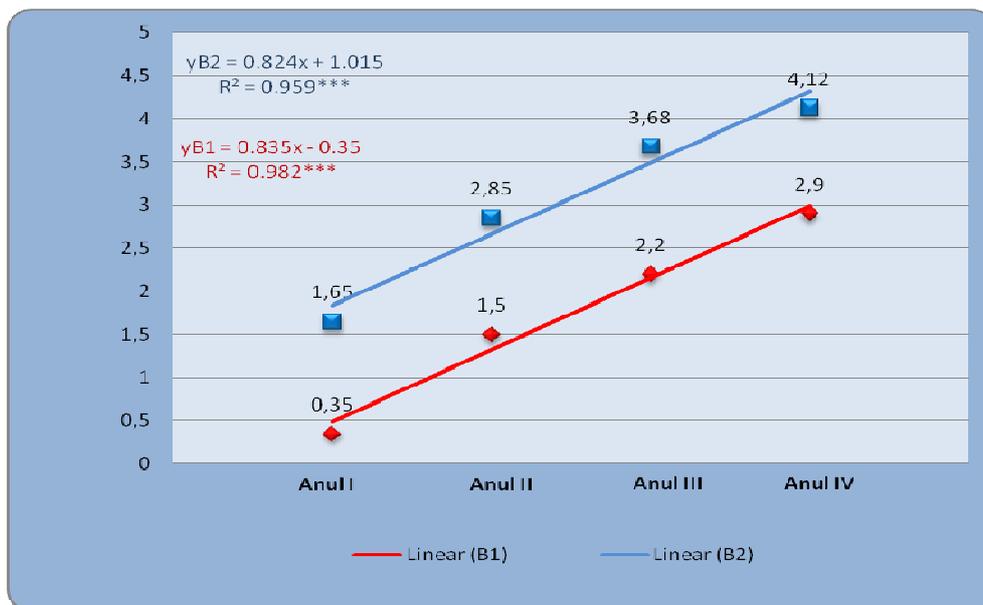


Figure 6. The correlation between sucker formation capacity of *Mme Lemoine* cultivar plants and culture substrate, during four years

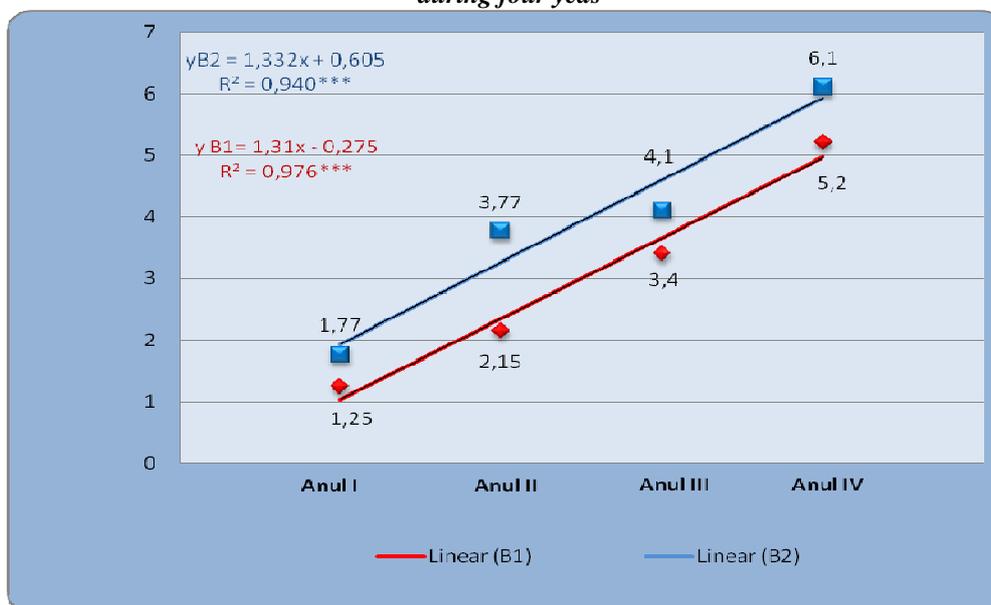


Figure 7. The correlation between sucker formation capacity of *Sensation* cultivar plants and culture substrate, during four years

4. CONCLUSIONS AND RECOMANDATION

- ▶ The substrate made of Danmuld peat determined bigger increases in height for both cultivars' plants, with values ranging between 9.14 – 45.80 cm for *Mme Lemoine* and 6.9 – 35.75 cm for *Sensation*, in the four years of pot fortification;
- ▶ Since it is intended to obtain a much larger numbers of suckers, both in the case of *Mme Lemoine* cultivar, as for *Sensation* cultivar, it will be applied the planting in a mixture of manure, leaves soil, peat and sand (2:2:2:1).
- ▶ For *Mme Lemoine* cultivar we can obtain inflorescences beginning with the fourth year of pot cultivation.

Figure 8 plays in images lilac plant evolution from the end of the acclimatization phase (Figure 6 A, B, C, D, E) by the end of fortification for each cultivar in part: *Mme Lemoine* and *Sensation* .

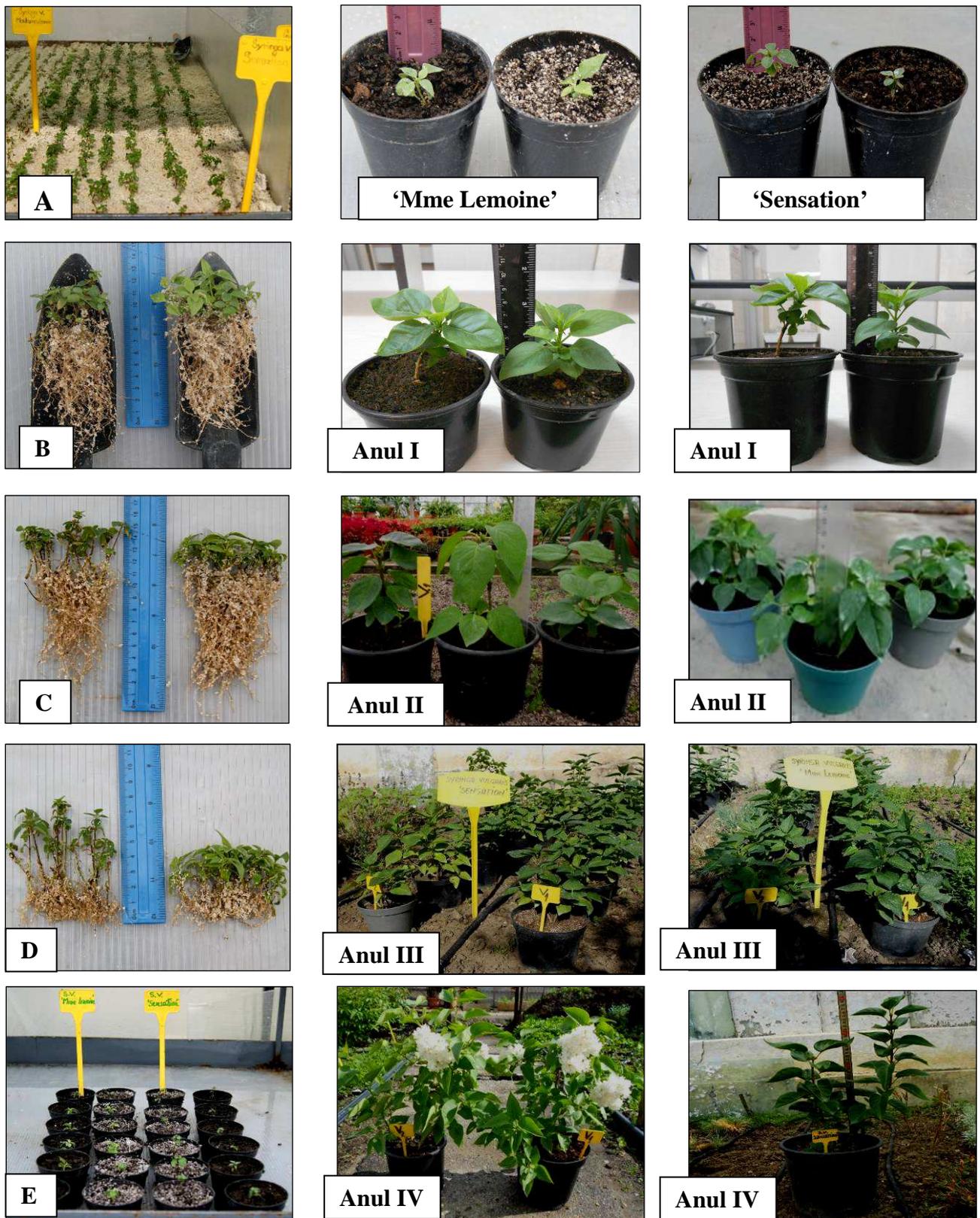


Figure 8. 'Mme Lemoine' and 'Sensation' cultivar's fortification (original)

The figures 9 and 10 are given synthetic technology of propagating material fortified the container for the two cultivars studied, with emphasis on experimental factors that induced the highest values of annual growth and number of suckers.

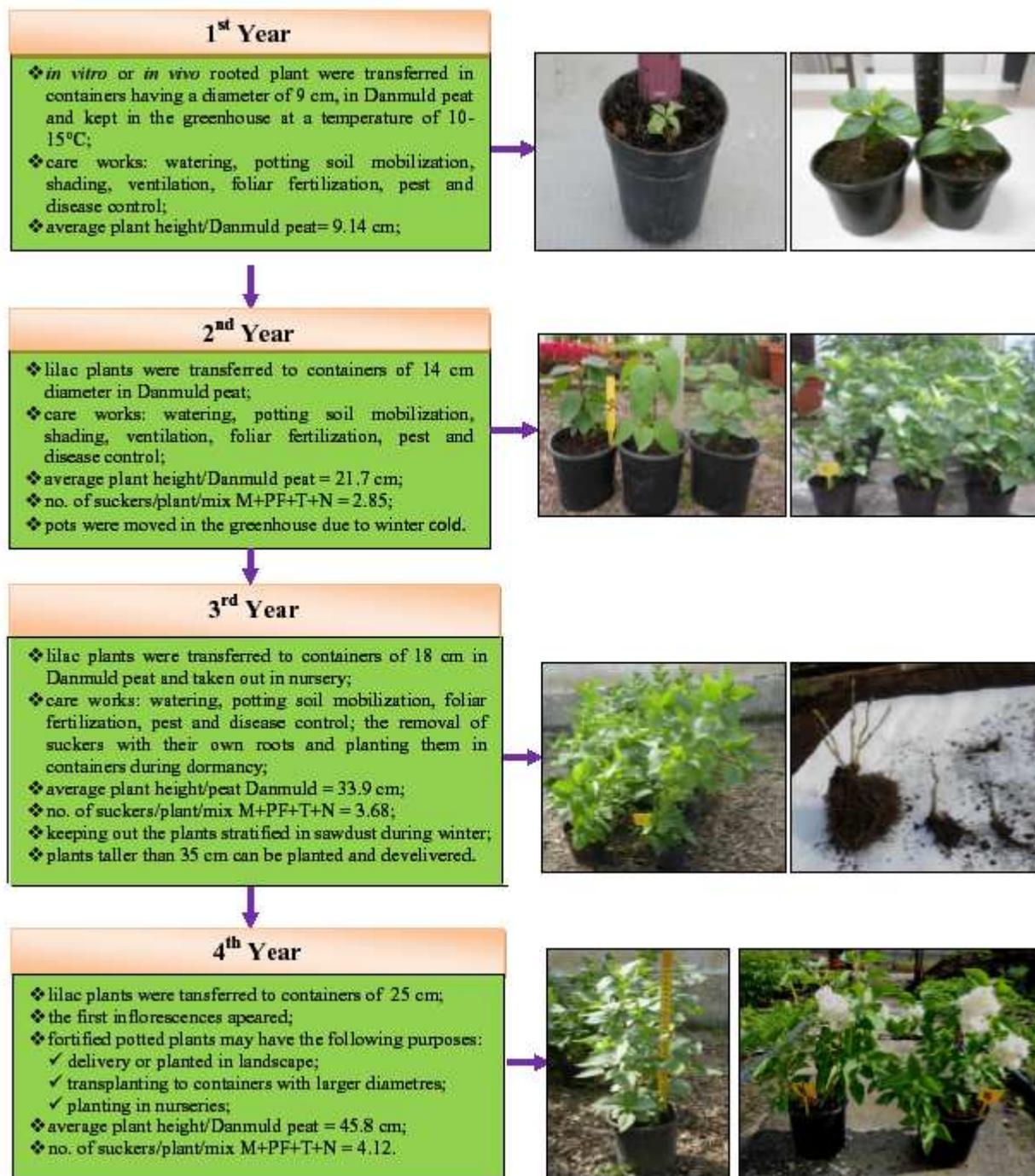


Figure 9. Fortification of planting material of Mme Lemoine's cultivar



Figure 10. Fortification of planting material on Sensation's cultivar

6. REFERENCES

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