



# Inducing Dwarfing Bougainvillea for urban and peri-urban Landscaping

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# Introduction

Bougainvillea is a very important plant as it is grown as shrub, climber, bush specimen, flowering hedge, ground cover, bonsai and pot plant.

It can be trained on walls of a house or any building, arches, pergolas, etc.

Provides colour to the garden almost throughout the year.

Greatly demanded by soft landscape architects for the development of landscapes as it requires minimum maintenance, blooms heavily during hot summer months, requires very less water.

Due to less water requirement and low maintenance cost it is preferred plant of people living in urban and peri urban areas.

It goes up to 30 m. height, so requires regular pruning to keep them in shape and to maintain size.

Breeding dwarf varieties or making bonsai or use of plant growth retardants could be alternatives to frequent pruning.

# Uses

**Shrub**

**Topiary**

**Climber**

**Bonsai**

**Pot  
plant**

**Hedge**

**Group planting**

**Arches & Pergolas**







**SEAT OF GREEN REVOLUTION, INDIAN AGRICULTURAL RESEARCH INSTITUTE**

International Crop Registration Authority for Bougainvillea appointed by the International Society for Horticultural Science, Belgium (1966)



## Objective

To induce dwarfing in bougainvillea cv. Shubhra with the use of growth retardants.

## Materials and Methods

Rooted cuttings of cv. Shubhra were planted on 7<sup>th</sup> July 2012 in earthen pot of 25 cm diameter and allowed to grow for two months

The plants were pruned to a uniform height of 25+5 cm, on 3<sup>rd</sup> September 2012.

After pruning the plants were treated with growth retardants



## Experimental details

- **Variety** : **Shubhra**
- **Treatments** : **11**
- **Replications** : **4**
- **Growth Retardants** : **3**  
(Paclobutrazol, maleic hydrazide, daminozide or B-9)
- **Experimental Design:** **CRD**
- **Mode of application** : **Spray or Drench**
- **Data was recorded at 2, 6, 10 and 14 weeks for vegetative traits and after 10 weeks for flower traits**





# Observations recorded

- Plant height (cm)
- Plant spread (cm)
- Internode distance (cm)
- Shoot length (cm)
- Shoot diameter (mm)
- Number of branches
- Growth index (Average plant height+ plant spread/2), flower index (1.00=none, 2.00 = slight, 3.00= some, 4.00=moderate, 5.00=heavy)
- Form index (1.00=poor, 2.00= fair, 3.00= good, 4.00= excellent)
- Number of structural branches per plant ( $\geq 15$  cm in length)
- Disease incidence (%)





# Treatment Details

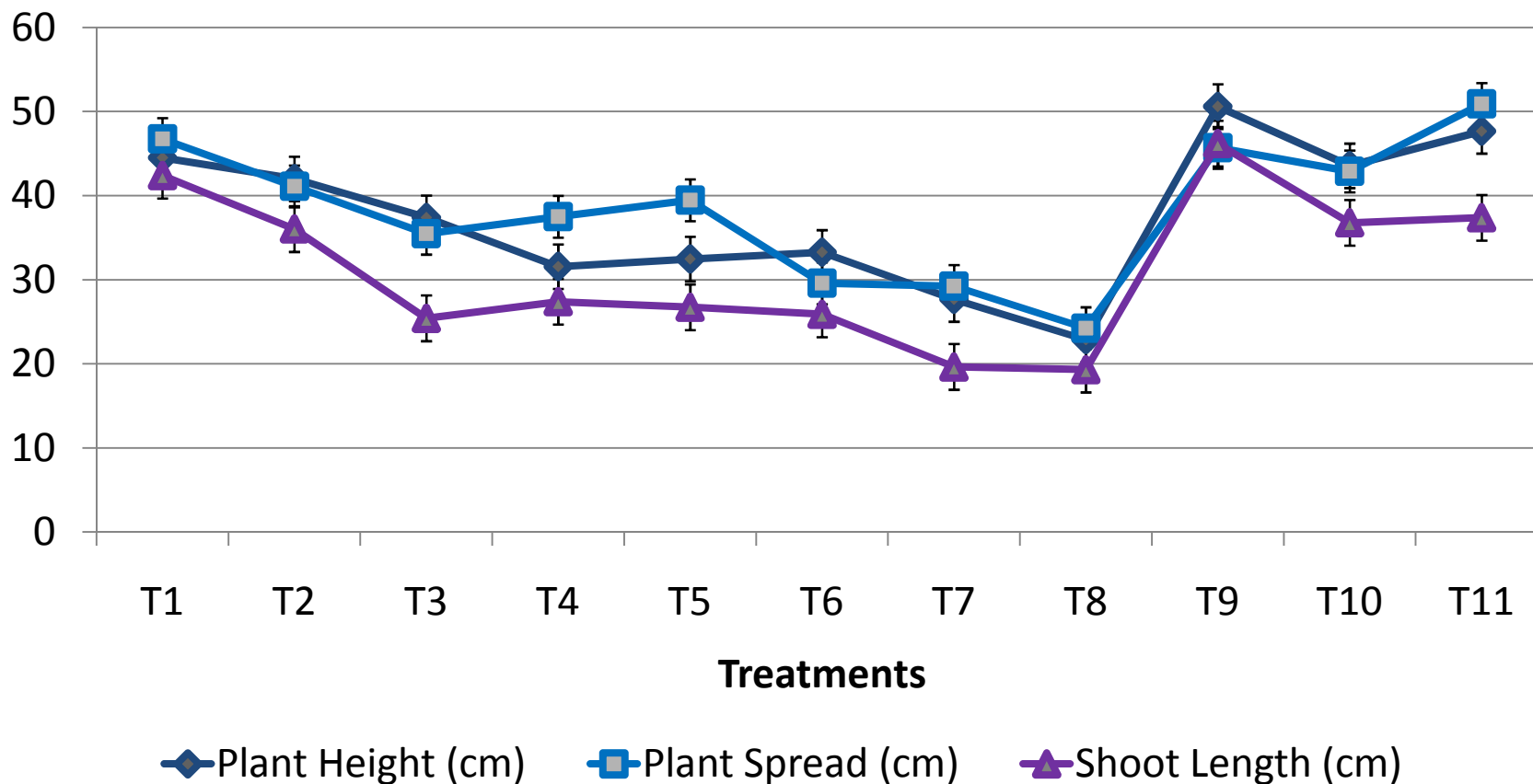
T <sub>1</sub> <sup>-</sup>	125ppm Paclobutrazol (Spray)
T <sub>2</sub> <sup>-</sup>	250ppm Paclobutrazol (Spray)
T <sub>3</sub> <sup>-</sup>	500ppm Paclobutrazol (Spray)
T <sub>4</sub> <sup>-</sup>	20 ppm Paclobutrazol (Drench)
T <sub>5</sub> <sup>-</sup>	30 ppm Paclobutrazol (Drench)
T <sub>6</sub> <sup>-</sup>	40 ppm Paclobutrazol (Drench)
T <sub>7</sub> <sup>-</sup>	1500 ppm Maleic Hydrazide (Spray)
T <sub>8</sub> <sup>-</sup>	2500 ppm Maleic Hydrazide (Spray)
T <sub>9</sub> <sup>-</sup>	5000ppm Daminozide (Spray)
T <sub>10</sub> <sup>-</sup>	7500ppm Daminozide (Spray)
T <sub>11</sub> <sup>-</sup>	Control





# Results

Effect of growth retardants on plant height , spread and shoot length of bougainvillea cv. Shubhra





## Effect of plant growth retardants on shoot diameter of bougainvillea cv. Shubhra

Treatments	Shoot Diameter (cm)					
	0 wk (W <sub>1</sub> )	2 wk (W <sub>2</sub> )	6 wk (W <sub>3</sub> )	10wk (W <sub>4</sub> )	14 wk (W <sub>5</sub> )	Mean
125ppm Paclobutrazol (T <sub>1</sub> )	9.66	9.74	10.57	9.83	10.10	9.98
250ppm Paclobutrazol (T <sub>2</sub> )	8.36	8.89	8.93	9.90	10.35	9.29
500ppm Paclobutrazol (T <sub>3</sub> )	7.48	6.05	8.22	7.95	8.21	7.58
20 ppm Paclobutrazol (T <sub>4</sub> )	<b>7.56</b>	<b>11.50</b>	<b>11.90</b>	<b>11.60</b>	<b>11.91</b>	<b>11.06</b>
30 ppm Paclobutrazol (T <sub>5</sub> )	7.68	7.62	8.44	8.97	9.22	8.39
40 ppm Paclobutrazol (T <sub>6</sub> )	7.16	7.80	7.62	8.02	8.26	7.77
1500 ppm Maleic Hydrazide (T <sub>7</sub> )	9.32	9.09	8.93	8.95	9.01	9.06
2500 ppm Maleic Hydrazide (T <sub>8</sub> )	11.99	8.07	8.20	7.81	7.82	8.78
5000ppm Daminozide (T <sub>9</sub> )	9.16	8.89	12.08	10.42	10.46	10.20
7500ppm Daminozide (T <sub>10</sub> )	8.87	10.35	10.59	10.32	10.37	10.10
Control (T <sub>11</sub> )	6.96	6.09	8.40	7.04	7.08	7.11
Mean	8.92	8.67	9.44	9.17	9.34	
CD <sub>0.05</sub>						
Treatments (T)	2.46					
Weeks (W)	NS					
(TxW)	NS					



## Effect of plant growth retardants on internode distance of bougainvillea cv. Shubhra

Treatments	Internode distance (cm)					
	0 wk (W <sub>1</sub> )	2 wk(W <sub>2</sub> )	6 wk (W <sub>3</sub> )	10wk (W <sub>4</sub> )	14 wk (W <sub>5</sub> )	Mean
125ppm Paclobutrazol (T <sub>1</sub> )	1.55	2.51	2.79	3.48	3.45	2.75
250ppm Paclobutrazol (T <sub>2</sub> )	1.81	2.25	2.12	5.03	4.64	3.17
500ppm Paclobutrazol (T <sub>3</sub> )	1.72	1.83	2.44	2.17	2.21	2.07
20 ppm Paclobutrazol (T <sub>4</sub> )	2.33	1.93	1.62	1.56	1.67	1.82
30 ppm Paclobutrazol (T <sub>5</sub> )	1.78	1.77	1.77	1.80	1.78	1.78
40 ppm Paclobutrazol (T <sub>6</sub> )	1.77	1.59	1.48	1.55	1.55	1.59
1500 ppm Maleic Hydrazide (T <sub>7</sub> )	1.47	1.86	2.04	2.05	2.05	1.89
2500 ppm Maleic Hydrazide (T <sub>8</sub> )	1.39	1.49	1.65	1.71	1.71	1.59
5000ppm Daminozide (T <sub>9</sub> )	1.23	2.42	2.88	2.89	2.71	2.42
7500ppm Daminozide (T <sub>10</sub> )	1.82	2.04	2.24	2.27	2.23	2.12
Control (T <sub>11</sub> )	2.65	1.75	1.87	1.91	1.89	2.01
Mean	1.77	1.95	2.08	2.40	2.35	
CD <sub>0.05</sub>						
Treatments (T)	0.52					
Weeks (W)	0.35					
(TxW)	1.15					



500 ppm Paclobutrazol spray



40 ppm Paclobutrazol drench



2500 ppm MH Spray



5000 ppm Daminozide spray

## Effect of different growth retardants on plant height of Bougainvillea Cv. Shubhra





## Effect of growth retardants on qualitative traits of bougainvillea cv. Shubhra

Treatments	No. of structural branches	Growth index	Flower index	Form index	Disease Incidence %
125ppm Paclobutrazol (T <sub>1</sub> )	9.50(3.23)	60.94	2.84	2.25	0.00(1.00)
250ppm Paclobutrazol (T <sub>2</sub> )	6.50(2.72)	50.06	3.00	1.75	0.00(1.00)
500ppm Paclobutrazol (T <sub>3</sub> )	5.00(2.45)	42.38	4.50	1.50	6.25(2.03)
20 ppm Paclobutrazol (T <sub>4</sub> )	2.50(1.87)	39.75	2.74	2.25	6.25(2.03)
30 ppm Paclobutrazol (T <sub>5</sub> )	5.00(2.38)	42.31	3.24	1.75	0.00(1.00)
40 ppm Paclobutrazol (T <sub>6</sub> )	3.00(1.91)	35.00	2.90	1.25	6.25(2.03)
1500 ppm Maleic Hydrazide (T <sub>7</sub> )	0.00(1.00)	30.13	1.00	2.00	0.00(1.00)
2500 ppm Maleic Hydrazide (T <sub>8</sub> )	0.00(1.00)	23.56	1.00	2.00	6.25(2.03)
5000ppm Daminozide (T <sub>9</sub> )	7.25(2.86)	60.31	2.48	2.25	0.00(1.00)
7500ppm Daminozide (T <sub>10</sub> )	7.00(2.82)	56.94	1.93	2.50	6.25(2.03)
Control (T <sub>11</sub> )	8.25(3.01)	70.94	2.68	3.00	6.25(2.03)
CD (0.05%)	0.55	14.77	1.48	0.64	NS



500 ppm Paclobutrazol Spray



30 ppm Paclobutrazol Drench



2500 ppm MH Spray



7500 ppm B-9 Spray

## Effect of growth retardants on flowering of Shubhra



## Conclusions

- Land, labour and time is a major constraint in urban and peri urban areas, therefore, using growth retardants to keep plants dwarf and enjoying the beauty in apartments is a very viable option.
- Application of 40 ppm paclobutrazol significantly reduced the plant height, internode distance, shoot length, growth and flowering index.
- Application of 500 ppm paclobutrazol resulted in compact plants with better flowering, however, drench application of 30 ppm could achieve the similar results.
- It is a very good alternative to pruning as the growth and flowering are not affected and the effect of retardants stay back for almost one year.



Thank you

