

**Table 1:** Effect of application methods, concentration of chitosan and their interactions on growth of sweet potato during 2013 and 2014 seasons under sandy soil conditions

| Treatments                                      | Vine length (cm) |             | Number of branches/ plant |             | Leaf area/ plant (m <sup>2</sup> ) |             | Dry weight of shoots (g/plant) |             | Relative increases in dry weight of shoot (%) |             |
|-------------------------------------------------|------------------|-------------|---------------------------|-------------|------------------------------------|-------------|--------------------------------|-------------|-----------------------------------------------|-------------|
|                                                 | 2013 season      | 2014 season | 2013 season               | 2014 season | 2013 season                        | 2014 season | 2013 season                    | 2014 season | 2013 season                                   | 2014 season |
| <b>Effect of application methods</b>            |                  |             |                           |             |                                    |             |                                |             |                                               |             |
| DSC                                             | 94.20            | 97.21       | 10.72                     | 10.21       | 0.58                               | 0.66        | 54.47                          | 51.04       | 0.0                                           | 0.0         |
| FS                                              | 97.45            | 97.52       | 11.98                     | 10.78       | 0.62                               | 0.62        | 58.19                          | 54.91       | 6.82                                          | 5.62        |
| DSC+FS                                          | 104.5            |             |                           |             |                                    |             |                                |             |                                               | 21.7        |
|                                                 | 6                | 103.66      | 13.83                     | 12.95       | 0.71                               | 0.73        | 69.20                          | 62.12       | 27.04                                         | 0           |
| <b>LSD at 5 % level</b>                         | <b>2.72</b>      | <b>3.21</b> | <b>1.35</b>               | <b>1.23</b> | <b>0.03</b>                        | <b>0.06</b> | <b>3.49</b>                    | <b>4.07</b> | --                                            | --          |
| <b>Effect of chitosan concentration</b>         |                  |             |                           |             |                                    |             |                                |             |                                               |             |
| Tap water (control)                             | 92.98            | 94.18       | 9.45                      | 9.24        | 0.52                               | 0.57        | 47.18                          | 46.30       | 0.0                                           | 0.0         |
| Chitosan 0.025 %                                | 98.44            | 98.23       | 11.75                     | 11.13       | 0.61                               | 0.67        | 59.76                          | 53.17       | 26.66                                         | 14.83       |
| Chitosan 0.075 %                                | 100.81           | 100.92      | 13.28                     | 12.08       | 0.66                               | 0.70        | 66.17                          | 56.55       | 40.23                                         | 22.13       |
| Chitosan 0.125 %                                | 102.70           | 104.53      | 14.22                     | 12.82       | 0.75                               | 0.74        | 69.36                          | 63.39       | 47.01                                         | 36.91       |
| <b>LSD at 5 % level</b>                         | <b>2.39</b>      | <b>2.82</b> | <b>1.19</b>               | <b>1.08</b> | <b>0.03</b>                        | <b>0.05</b> | <b>3.06</b>                    | <b>3.57</b> | --                                            | --          |
| <b>Effect of interaction treatments</b>         |                  |             |                           |             |                                    |             |                                |             |                                               |             |
| DSC in tap water                                | 92.10            | 93.14       | 9.22                      | 9.01        | 0.51                               | 0.54        | 47.18                          | 45.50       | 0.0                                           | 0.0         |
| DSC in 0.025% chitosan                          | 94.20            | 97.28       | 10.20                     | 10.18       | 0.57                               | 0.60        | 54.25                          | 49.21       | 14.48                                         | 8.75        |
| DSC in 0.075%chitosan                           | 90.26            | 99.18       | 11.18                     | 10.47       | 0.61                               | 0.71        | 57.18                          | 52.31       | 21.19                                         | 14.46       |
| DSC in 0.125%chitosan                           | 90.14            | 99.20       | 12.24                     | 11.19       | 0.62                               | 0.74        | 59.25                          | 57.12       | 25.58                                         | 25.53       |
| FS in tap water                                 | 93.10            | 90.19       | 9.42                      | 9.01        | 0.52                               | 0.58        | 48.18                          | 46.50       | 0.0                                           | 0.0         |
| FS with 0.025%chitosan                          | 97.20            | 90.38       | 11.14                     | 10.34       | 0.56                               | 0.64        | 55.15                          | 50.12       | 14.46                                         | 7.78        |
| FS with 0.075%chitosan                          | 98.31            | 97.38       | 13.12                     | 11.18       | 0.60                               | 0.63        | 63.16                          | 56.18       | 31.10                                         | 20.81       |
| FS with 0.125%chitosan                          | 101.13           | 102.14      | 14.22                     | 12.10       | 0.81                               | 0.63        | 66.25                          | 66.84       | 37.46                                         | 43.74       |
| DSC in tap water +FS in tap water               | 93.70            | 94.22       | 9.72                      | 9.20        | 0.53                               | 0.59        | 46.18                          | 46.90       | 0.0                                           | 0.0         |
| DSC in 0.025% chitosan + FS with 0.025%chitosan | 103.83           | 102.02      | 13.85                     | 12.86       | 0.70                               | 0.71        | 69.87                          | 60.19       | 51.29                                         | 28.33       |
| DSC in 0.075% chitosan + FS with 0.075%chitosan | 108.87           | 106.19      | 15.54                     | 14.58       | 0.78                               | 0.77        | 78.18                          | 65.17       | 69.29                                         | 38.95       |
| DSC in 0.125% chitosan+ FS with 0.125%chitosan  | 111.84           | 112.21      | 16.20                     | 15.17       | 0.83                               | 0.84        | 82.58                          | 76.20       | 78.82                                         | 62.47       |
| <b>LSD at 5 % level</b>                         | <b>4.20</b>      | <b>4.95</b> | <b>NS</b>                 | <b>1.90</b> | <b>0.05</b>                        | <b>NS</b>   | <b>5.36</b>                    | <b>6.27</b> | --                                            | --          |

DSC: dipping stem cutting, FS: foliar spraying, DSC+FS: dipping stem cutting+ foliar spraying

**Table 2:** Effect of application methods, concentration of chitosan and their interactions on leaf pigments ( mg/gm DW) of sweet potato during 2013 and 2014 seasons under sandy soil conditions

| Treatments                                      | Chlorophyll (a) |                | Chlorophyll (b) |                | Total chlorophyll (a+b) |                | Carotenoides   |                |
|-------------------------------------------------|-----------------|----------------|-----------------|----------------|-------------------------|----------------|----------------|----------------|
|                                                 | 2013<br>season  | 2014<br>season | 2013<br>season  | 2014<br>season | 2013<br>season          | 2014<br>season | 2013<br>season | 2014<br>season |
| <i>Effect of application methods</i>            |                 |                |                 |                |                         |                |                |                |
| DSC                                             | 2.37            | 2.36           | 1.30            | 1.37           | 3.67                    | 3.73           | 1.86           | 1.62           |
| FS                                              | 2.61            | 2.48           | 1.36            | 1.31           | 3.95                    | 3.79           | 1.72           | 1.67           |
| DSC+FS                                          | 2.90            | 2.86           | 1.57            | 1.54           | 4.45                    | 4.40           | 1.86           | 1.85           |
| <b>LSD at 5 % level</b>                         | <b>0.21</b>     | <b>0.17</b>    | <b>NS</b>       | <b>NS</b>      | <b>0.13</b>             | <b>0.16</b>    | <b>NS</b>      | <b>NS</b>      |
| <i>Effect of chitosan concentration</i>         |                 |                |                 |                |                         |                |                |                |
| Tap water (control)                             | 2.30            | 2.21           | 1.20            | 1.26           | 3.46                    | 3.47           | 1.76           | 1.56           |
| Chitosan 0.025 %                                | 2.64            | 2.47           | 1.37            | 1.36           | 4.01                    | 3.83           | 1.84           | 1.68           |
| Chitosan 0.075 %                                | 2.69            | 2.71           | 1.45            | 1.43           | 4.15                    | 4.15           | 1.79           | 1.74           |
| Chitosan 0.125 %                                | 2.87            | 2.87           | 1.61            | 1.56           | 4.48                    | 4.43           | 1.85           | 1.87           |
| <b>LSD at 5 % level</b>                         | <b>0.18</b>     | <b>0.15</b>    | <b>0.08</b>     | <b>0.09</b>    | <b>0.11</b>             | <b>0.14</b>    | <b>NS</b>      | <b>0.13</b>    |
| <i>Effect of interaction treatments</i>         |                 |                |                 |                |                         |                |                |                |
| <b>DSC in tap water</b>                         | 2.28            | 2.20           | 1.18            | 1.26           | 3.46                    | 3.47           | 1.76           | 1.56           |
| <b>DSC in 0.025% chitosan</b>                   | 2.40            | 2.13           | 1.29            | 1.33           | 3.69                    | 3.46           | 1.81           | 1.58           |
| DSC in 0.075%chitosan                           | 2.41            | 2.51           | 1.31            | 1.36           | 3.72                    | 3.87           | 1.90           | 1.73           |
| DSC in 0.125%chitosan                           | 2.40            | 2.60           | 1.42            | 1.51           | 3.82                    | 4.11           | 1.90           | 1.70           |
| FS in tap water                                 | 2.32            | 2.21           | 1.20            | 1.26           | 3.52                    | 3.47           | 1.76           | 1.56           |
| FS with 0.025%chitosan                          | 2.61            | 2.19           | 1.23            | 1.28           | 3.83                    | 3.47           | 1.86           | 1.63           |
| FS with 0.075%chitosan                          | 2.60            | 2.63           | 1.37            | 1.28           | 3.97                    | 3.91           | 1.86           | 1.59           |
| FS with 0.125%chitosan                          | 2.89            | 2.90           | 1.63            | 1.41           | 4.52                    | 4.31           | 1.91           | 1.90           |
| DSC in tap water +FS in tap water               | 2.31            | 2.23           | 1.21            | 1.26           | 3.52                    | 3.47           | 1.76           | 1.56           |
| DSC in 0.025% chitosan + FS with 0.025%chitosan | 2.90            | 3.10           | 1.59            | 1.47           | 4.49                    | 4.57           | 1.84           | 1.82           |
| DSC in 0.075% chitosan + FS with 0.075%chitosan | 3.07            | 3.00           | 1.68            | 1.66           | 4.75                    | 4.66           | 1.92           | 2.00           |
| DSC in 0.125% chitosan+ FS with 0.125%chitosan  | 3.32            | 3.11           | 1.78            | 1.77           | 5.10                    | 4.88           | 1.90           | 2.01           |
| <b>LSD at 5 % level</b>                         | <b>0.32</b>     | <b>0.26</b>    | <b>NS</b>       | <b>NS</b>      | <b>0.19</b>             | <b>0.24</b>    | <b>NS</b>      | <b>NS</b>      |

DSC: dipping stem cutting, FS: foliar spraying, DSC+FS: dipping stem cutting+ foliar spraying

**Table 3:**Effect of application methods, concentration of chitosan and their interactions on N,P and K uptake (mg) by shoot of sweet potato during 2013 and 2014 seasons under sandy soil conditions

| Treatments                                     | N              |                | P              |                | K              |                |
|------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                                | 2013<br>season | 2014<br>season | 2013<br>season | 2014<br>season | 2013<br>season | 2014<br>season |
| <i>Effect of application methods</i>           |                |                |                |                |                |                |
| DSC                                            | 1418           | 1309           | 274            | 261            | 971            | 956            |
| FS                                             | 1483           | 1257           | 251            | 238            | 1030           | 945            |
| DSC+FS                                         | 2065           | 1840           | 339            | 310            | 1399           | 1336           |
| <b>LSD at 5 % level</b>                        | <b>159.2</b>   | <b>153.9</b>   | <b>12.0</b>    | <b>9.3</b>     | <b>71.2</b>    | <b>86.9</b>    |
| <i>Effect of chitosan concentration</i>        |                |                |                |                |                |                |
| Tap water (control)                            | 1076           | 1055           | 223            | 225            | 770            | 783            |
| Chitosan 0.025 %                               | 1569           | 1349           | 282            | 256            | 1038           | 995            |
| Chitosan 0.075 %                               | 1876           | 1578           | 321            | 290            | 1248           | 1128           |
| Chitosan 0.125 %                               | 2100           | 1893           | 326            | 309            | 1479           | 1411           |
| <b>LSD at 5 % level</b>                        | <b>139.7</b>   | <b>135.0</b>   | <b>10.6</b>    | <b>8.2</b>     | <b>62.7</b>    | <b>76.4</b>    |
| <i>Effect of interaction treatments</i>        |                |                |                |                |                |                |
| DSC in tap water                               | 1068           | 1031           | 225            | 223            | 765            | 772            |
| DSC in 0.025% chitosan                         | 1317           | 1131           | 270            | 246            | 896            | 856            |
| DSC in 0.075%chitosan                          | 1520           | 1478           | 297            | 276            | 1060           | 1009           |
| DSC in 0.125%chitosan                          | 1767           | 1596           | 305            | 301            | 1164           | 1190           |
| FS in tap water                                | 1150           | 1073           | 227            | 224            | 795            | 786            |
| FS with 0.025%chitosan                         | 1376           | 1219           | 246            | 232            | 901            | 806            |
| FS with 0.075%chitosan                         | 1702           | 1211           | 280            | 264            | 1004           | 916            |
| FS with 0.125%chitosan                         | 1705           | 1527           | 251            | 234            | 1423           | 1272           |
| DSC in tap water +FS in tap water              | 1011           | 1061           | 218            | 228            | 751            | 792            |
| DSC in 0.025%chitosan + FS with 0.025%chitosan | 2016           | 1697           | 330            | 290            | 1318           | 1323           |
| DSC in 0.075%chitosan+ FS with 0.075%chitosan  | 2408           | 2045           | 386            | 330            | 1680           | 1461           |
| DSC in 0.125% chitosan+ FS with 0.125%chitosan | 2828           | 2558           | 424            | 393            | 1850           | 1771           |
| <b>LSD at 5 % level</b>                        | <b>245</b>     | <b>237</b>     | <b>18</b>      | <b>14</b>      | <b>110</b>     | <b>134</b>     |

DSC: dipping stem cutting, FS: foliar spraying, DSC+FS: dipping stem cutting+ foliar spraying

**Table 4:**Effect of application methods, concentration of chitosan and their interactions of chitosan on yield and its components of sweet potato during 2013 and 2014 seasons under sandy soil conditions

| Treatments                                     | Average weight of tuber root (g) |             | Unmarketable yield (ton/fad.) |              | Marketable yield (ton/fad.) |              | Total yield (ton/fad.) |              | Relative increases in total yield (%) |             |
|------------------------------------------------|----------------------------------|-------------|-------------------------------|--------------|-----------------------------|--------------|------------------------|--------------|---------------------------------------|-------------|
|                                                | 2013 season                      | 2014 season | 2013 season                   | 2014 season  | 2013 season                 | 2014 season  | 2013 season            | 2014 season  | 2013 season                           | 2014 season |
| <i>Effect of application methods</i>           |                                  |             |                               |              |                             |              |                        |              |                                       |             |
| DSC                                            | 129.3                            | 138.0       | 2.636                         | 3.242        | 8.043                       | 8.030        | 10.679                 | 11.272       | 000                                   | 000         |
| FS                                             | 131.3                            | 137.0       | 2.437                         | 2.440        | 8.344                       | 9.025        | 10.781                 | 11.465       | 1.00                                  | 1.7         |
| DSC+FS                                         | 148.5                            | 152.5       | 2.311                         | 2.399        | 9.418                       | 9.748        | 11.730                 | 12.147       | 9.8                                   | 7.8         |
| <b>LSD at 5 % level</b>                        | <b>NS</b>                        | <b>NS</b>   | <b>NS</b>                     | <b>NS</b>    | <b>0.436</b>                | <b>0.463</b> | <b>0.690</b>           | <b>0.602</b> | <b>--</b>                             | <b>--</b>   |
| <i>Effect of chitosan concentration</i>        |                                  |             |                               |              |                             |              |                        |              |                                       |             |
| Tap water (control)                            | 119.0                            | 123.0       | 3.337                         | 3.698        | 6.625                       | 6.726        | 9.962                  | 10.424       | 00                                    | 00          |
| Chitosan 0.025 %                               | 130.7                            | 141.7       | 2.519                         | 3.218        | 8.027                       | 8.386        | 10.546                 | 11.604       | 5.9                                   | 11.3        |
| Chitosan 0.075 %                               | 143.0                            | 149.0       | 2.367                         | 2.154        | 9.272                       | 9.981        | 11.639                 | 12.134       | 16.8                                  | 16.4        |
| Chitosan 0.125 %                               | 152.7                            | 156.3       | 1.624                         | 1.705        | 10.483                      | 10.644       | 12.107                 | 12.349       | 21.5                                  | 18.5        |
| <b>LSD at 5 % level</b>                        | <b>17.7</b>                      | <b>14.4</b> | <b>0.213</b>                  | <b>0.235</b> | <b>0.383</b>                | <b>0.407</b> | <b>0.606</b>           | <b>0.616</b> | <b>--</b>                             | <b>--</b>   |
| <i>Effect of interaction treatments</i>        |                                  |             |                               |              |                             |              |                        |              |                                       |             |
| DSC in tap water                               | 118                              | 123         | 3.296                         | 3.757        | 6.644                       | 6.706        | 9.940                  | 10.463       | 00                                    | 00          |
| DSC in 0.025% chitosan                         | 120                              | 138         | 2.606                         | 3.382        | 7.484                       | 7.652        | 10.090                 | 11.034       | 1.5                                   | 5.5         |
| DSC in 0.075%chitosan                          | 133                              | 146         | 2.663                         | 3.533        | 8.347                       | 8.010        | 11.010                 | 11.543       | 10.8                                  | 10.3        |
| DSC in 0.125%chitosan                          | 141                              | 140         | 1.979                         | 2.295        | 9.698                       | 9.752        | 11.677                 | 12.047       | 17.5                                  | 15.1        |
| FS in tap water                                | 120                              | 121         | 3.411                         | 3.635        | 6.574                       | 6.776        | 9.985                  | 10.411       | 00                                    | 00          |
| FS with 0.025%chitosan                         | 121                              | 130         | 2.897                         | 3.711        | 7.173                       | 7.639        | 10.070                 | 11.350       | 1.3                                   | 8.5         |
| FS with 0.075%chitosan                         | 139                              | 141         | 2.149                         | 1.088        | 9.221                       | 10.942       | 11.370                 | 12.030       | 14.4                                  | 15.0        |
| FS with 0.125%chitosan                         | 140                              | 101         | 1.291                         | 1.326        | 10.409                      | 10.744       | 11.700                 | 12.070       | 17.7                                  | 15.4        |
| DSC in tap water +FS in tap water              | 119                              | 125         | 3.303                         | 3.703        | 6.657                       | 6.696        | 9.960                  | 10.399       | 00                                    | 00          |
| DSC in 0.025%chitosan + FS with 0.025%chitosan | 146                              | 152         | 2.053                         | 2.56         | 9.424                       | 9.867        | 11.477                 | 12.427       | 15.5                                  | 18.8        |
| DSC in 0.075%chitosan + FS with 0.075%chitosan | 157                              | 160         | 2.288                         | 1.84         | 10.249                      | 10.99        | 12.537                 | 12.830       | 26.1                                  | 22.6        |
| DSC in 0.125%chitosan + FS with 0.125%chitosan | 172                              | 173         | 1.601                         | 1.493        | 11.343                      | 11.437       | 12.944                 | 12.930       | 30.2                                  | 23.6        |
| <b>LSD at 5 % level</b>                        | <b>31.2</b>                      | <b>25.2</b> | <b>0.375</b>                  | <b>0.412</b> | <b>0.672</b>                | <b>0.715</b> | <b>1.064</b>           | <b>1.080</b> | <b>--</b>                             | <b>--</b>   |

DSC: Dipping stem cutting, FS: Foliar spraying, DSC+FS: Dipping stem cutting+ foliar spraying

**Table 5:** Effect of application methods, concentration of chitosan and their interactions on tuber root quality of sweet potato at harvest during 2013 and 2014 seasons under sandy soil conditions

| Treatments                                      | Starch (%)  |             | TSS (%)     |             | Total sugars |             | Carotene (mg/gm FW) |             |
|-------------------------------------------------|-------------|-------------|-------------|-------------|--------------|-------------|---------------------|-------------|
|                                                 | 2013 season | 2014 season | 2013 season | 2014 season | 2013 season  | 2014 season | 2013 season         | 2014 season |
| <i>Effect of application methods</i>            |             |             |             |             |              |             |                     |             |
| DSC                                             | 47.9        | 47.0        | 8.07        | 8.22        | 7.82         | 7.70        | 9.59                | 9.53        |
| FS                                              | 48.4        | 49.5        | 8.15        | 8.22        | 7.68         | 8.11        | 9.56                | 9.43        |
| DSC+FS                                          | 52.8        | 53.1        | 8.61        | 8.73        | 8.29         | 8.49        | 10.06               | 9.91        |
| <b>LSD at 5 % level</b>                         | <b>1.11</b> | <b>1.17</b> | <b>NS</b>   | <b>NS</b>   | <b>NS</b>    | <b>0.15</b> | <b>NS</b>           | <b>NS</b>   |
| <i>Effect of chitosan concentration</i>         |             |             |             |             |              |             |                     |             |
| Tap water (control)                             | 44.1        | 43.0        | 7.74        | 7.76        | 7.16         | 7.08        | 9.26                | 9.33        |
| Chitosan 0.025 %                                | 49.7        | 50.1        | 8.34        | 8.33        | 7.89         | 8.35        | 9.38                | 9.61        |
| Chitosan 0.075 %                                | 51.7        | 52.5        | 8.43        | 8.61        | 8.26         | 8.43        | 10.07               | 9.68        |
| Chitosan 0.125 %                                | 53.2        | 53.7        | 8.59        | 8.86        | 8.41         | 8.53        | 10.25               | 9.87        |
| <b>LSD at 5 % level</b>                         | <b>0.98</b> | <b>1.03</b> | <b>0.08</b> | <b>NS</b>   | <b>0.08</b>  | <b>0.13</b> | <b>NS</b>           | <b>NS</b>   |
| <i>Effect of interaction treatments</i>         |             |             |             |             |              |             |                     |             |
| DSC in tap water                                | 44.10       | 43.20       | 7.74        | 7.79        | 7.21         | 7.06        | 9.11                | 9.29        |
| DSC in 0.025% chitosan                          | 46.18       | 46.10       | 8.22        | 8.11        | 7.71         | 7.61        | 9.18                | 9.40        |
| DSC in 0.075%chitosan                           | 50.22       | 49.10       | 8.19        | 8.39        | 8.10         | 8.00        | 9.90                | 9.50        |
| DSC in 0.125%chitosan                           | 51.13       | 49.28       | 8.20        | 8.61        | 8.21         | 8.10        | 10.20               | 9.93        |
| FS in tap water                                 | 44.49       | 43.01       | 7.87        | 7.69        | 7.11         | 7.03        | 9.26                | 9.33        |
| FS with 0.025%chitosan                          | 49.38       | 50.23       | 8.26        | 8.01        | 7.63         | 8.68        | 9.10                | 9.50        |
| FS with 0.075%chitosan                          | 49.38       | 51.12       | 8.13        | 8.41        | 7.90         | 8.41        | 10.01               | 9.44        |
| FS with 0.125%chitosan                          | 50.19       | 53.44       | 8.37        | 8.77        | 8.11         | 8.32        | 9.90                | 9.48        |
| DSC in tap water +FS in tap water               | 43.76       | 42.80       | 7.73        | 7.81        | 7.17         | 7.17        | 9.42                | 9.37        |
| DSC in 0.025% chitosan + FS with 0.025%chitosan | 53.55       | 53.87       | 8.56        | 8.88        | 8.34         | 8.76        | 9.87                | 9.95        |
| DSC in 0.075% chitosan + FS with 0.075%chitosan | 55.59       | 57.22       | 8.98        | 9.03        | 8.75         | 8.90        | 10.30               | 10.12       |
| DSC in 0.125% chitosan+ FS with 0.125%chitosan  | 58.31       | 58.38       | 9.17        | 9.22        | 8.93         | 9.13        | 10.67               | 10.22       |
| <b>LSD at 5 % level</b>                         | <b>1.72</b> | <b>1.82</b> | <b>NS</b>   | <b>NS</b>   | <b>0.14</b>  | <b>0.22</b> | <b>NS</b>           | <b>NS</b>   |

DSC: Dipping stem cutting, FS: Foliar spraying, DSC+FS: Dipping stem cutting+ foliar spraying

**Table 6:** Effect of application methods, concentration of chitosan and their interactions on weight loss (%) of tuber roots during storage of sweet potato in 2013 and 2014 seasons

| Treatments                                     | Weight loss (%)   |                |                |                |                |                |                |                |
|------------------------------------------------|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                                | Days from storage |                |                |                |                |                |                |                |
|                                                | 30                |                | 60             |                | 90             |                | 120            |                |
|                                                | 2013<br>season    | 2014<br>season | 2013<br>season | 2014<br>season | 2013<br>season | 2014<br>season | 2013<br>season | 2014<br>season |
| <i>Effect of application methods</i>           |                   |                |                |                |                |                |                |                |
| DSC                                            | 8.59              | 8.08           | 16.53          | 18.65          | 32.49          | 32.78          | 48.18          | 48.01          |
| FS                                             | 8.53              | 8.87           | 16.55          | 20.21          | 31.01          | 34.74          | 41.39          | 41.56          |
| DSC+FS                                         | 6.93              | 7.59           | 14.47          | 16.99          | 26.45          | 30.48          | 38.19          | 38.23          |
| <b>LSD at 5 % level</b>                        | <b>NS</b>         | <b>NS</b>      | <b>1.41</b>    | <b>1.66</b>    | <b>1.40</b>    | <b>1.87</b>    | <b>2.02</b>    | <b>2.33</b>    |
| <i>Effect of chitosan concentration</i>        |                   |                |                |                |                |                |                |                |
| Tap water (control)                            | 9.39              | 10.16          | 19.57          | 21.30          | 35.29          | 37.34          | 53.46          | 51.45          |
| Chitosan 0.025 %                               | 8.21              | 8.56           | 15.87          | 19.78          | 30.35          | 33.58          | 42.13          | 42.51          |
| Chitosan 0.075 %                               | 7.62              | 7.48           | 14.33          | 17.45          | 27.55          | 30.47          | 38.58          | 39.79          |
| Chitosan 0.125 %                               | 6.85              | 6.52           | 13.63          | 15.93          | 26.74          | 29.26          | 36.16          | 36.67          |
| <b>LSD at 5 % level</b>                        | <b>0.66</b>       | <b>1.07</b>    | <b>1.24</b>    | <b>1.46</b>    | <b>1.23</b>    | <b>1.64</b>    | <b>1.77</b>    | <b>2.04</b>    |
| <i>Effect of interaction treatments</i>        |                   |                |                |                |                |                |                |                |
| DSC in tap water                               | 9.01              | 10.10          | 19.07          | 21.20          | 30.29          | 37.40          | 53.18          | 51.20          |
| DSC in 0.025% chitosan                         | 8.93              | 8.73           | 16.18          | 19.72          | 34.24          | 33.10          | 50.16          | 49.48          |
| DSC in 0.075%chitosan                          | 8.73              | 7.10           | 10.24          | 17.40          | 31.22          | 30.30          | 47.18          | 46.14          |
| DSC in 0.125%chitosan                          | 7.20              | 6.30           | 10.13          | 16.21          | 29.22          | 30.26          | 42.21          | 40.22          |
| FS in tap water                                | 9.47              | 10.31          | 19.01          | 21.37          | 30.41          | 37.26          | 53.72          | 51.60          |
| FS with 0.025%chitosan                         | 8.01              | 9.21           | 17.26          | 22.00          | 30.24          | 36.12          | 40.21          | 41.17          |
| FS with 0.075%chitosan                         | 8.00              | 8.01           | 10.22          | 19.12          | 29.20          | 34.20          | 36.18          | 40.28          |
| FS with 0.125%chitosan                         | 8.10              | 7.40           | 14.22          | 18.30          | 29.10          | 31.32          | 30.44          | 33.20          |
| DSC in tap water +FS in tap water              | 9.18              | 10.07          | 19.64          | 21.29          | 30.18          | 37.37          | 53.49          | 51.04          |
| DSC in 0.025%chitosan + FS with 0.025%chitosan | 7.18              | 7.73           | 14.16          | 17.62          | 26.58          | 31.48          | 36.03          | 36.87          |
| DSC in 0.075%chitosan+ FS with 0.075%chitosan  | 6.13              | 6.79           | 12.52          | 15.82          | 22.19          | 26.87          | 32.38          | 32.94          |
| DSC in 0.125% chitosan+ FS with 0.125%chitosan | 5.21              | 5.77           | 11.54          | 13.23          | 21.85          | 26.21          | 30.84          | 31.58          |
| <b>LSD at 5 % level</b>                        | <b>1.17</b>       | <b>1.89</b>    | <b>2.18</b>    | <b>2.57</b>    | <b>2.15</b>    | <b>2.88</b>    | <b>3.11</b>    | <b>3.58</b>    |

DSC: Dipping stem cutting, FS: Foliar spraying, DSC+FS: Dipping stem cutting+ foliar spraying

**Table 7:** Effect of application methods, concentration of chitosan and their interactions on decay (%) of tuber roots during storage of sweet potato in 2013 and 2014 seasons

| Treatments                                      | Decay (%)         |                |                |                |                |                |                |                |
|-------------------------------------------------|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                                 | Days from storage |                |                |                |                |                |                |                |
|                                                 | 30                |                | 60             |                | 90             |                | 120            |                |
|                                                 | 2013<br>season    | 2014<br>season | 2013<br>season | 2014<br>season | 2013<br>season | 2014<br>season | 2013<br>season | 2014<br>season |
| <i>Effect of application methods</i>            |                   |                |                |                |                |                |                |                |
| DSC                                             | 0.00              | 0.00           | 1.42           | 1.52           | 5.05           | 6.50           | 8.52           | 9.37           |
| FS                                              | 0.00              | 0.00           | 1.45           | 1.45           | 5.08           | 5.78           | 7.69           | 9.01           |
| DSC+FS                                          | 0.00              | 0.00           | 1.29           | 1.36           | 4.43           | 4.47           | 6.67           | 7.69           |
| <b>LSD at 5 % level</b>                         | <b>---</b>        | <b>--</b>      | <b>NS</b>      | <b>NS</b>      | <b>NS</b>      | <b>0.75</b>    | <b>0.76</b>    | <b>0.99</b>    |
| <i>Effect of chitosan concentration</i>         |                   |                |                |                |                |                |                |                |
| Tap water (control)                             | 0.00              | 0.00           | 1.58           | 1.57           | 6.17           | 7.22           | 10.26          | 11.13          |
| Chitosan 0.025 %                                | 0.00              | 0.00           | 1.37           | 1.48           | 4.94           | 5.84           | 7.46           | 8.71           |
| Chitosan 0.075 %                                | 0.00              | 0.00           | 1.34           | 1.36           | 4.36           | 5.01           | 6.66           | 7.96           |
| Chitosan 0.125 %                                | 0.00              | 0.00           | 1.24           | 1.36           | 3.94           | 4.26           | 6.13           | 6.95           |
| <b>LSD at 5 % level</b>                         | <b>--</b>         | <b>--</b>      | <b>NS</b>      | <b>NS</b>      | <b>0.63</b>    | <b>0.66</b>    | <b>0.67</b>    | <b>0.87</b>    |
| <i>Effect of interaction treatments</i>         |                   |                |                |                |                |                |                |                |
| DSC in tap water                                | 0.0               | 0.0            | 1.59           | 1.69           | 6.21           | 7.19           | 10.50          | 11.30          |
| DSC in 0.025% chitosan                          | 0.0               | 0.0            | 1.40           | 1.55           | 5.30           | 7.04           | 8.20           | 9.19           |
| DSC in 0.075%chitosan                           | 0.0               | 0.0            | 1.39           | 1.40           | 4.40           | 6.35           | 8.12           | 8.98           |
| DSC in 0.125%chitosan                           | 0.0               | 0.0            | 1.30           | 1.44           | 4.30           | 5.40           | 7.25           | 8.00           |
| FS in tap water                                 | 0.0               | 0.0            | 1.64           | 1.49           | 6.05           | 7.42           | 10.04          | 10.88          |
| FS with 0.025%chitosan                          | 0.0               | 0.0            | 1.41           | 1.51           | 5.19           | 6.17           | 8.30           | 9.45           |
| FS with 0.075%chitosan                          | 0.0               | 0.0            | 1.42           | 1.40           | 4.95           | 5.18           | 6.40           | 8.31           |
| FS with 0.125%chitosan                          | 0.0               | 0.0            | 1.31           | 1.40           | 4.12           | 4.36           | 6.03           | 7.40           |
| DSC in tap water +FS in tap water               | 0.0               | 0.0            | 1.51           | 1.52           | 6.26           | 7.06           | 10.23          | 11.22          |
| DSC in 0.025% chitosan + FS with 0.025%chitosan | 0.00              | 0.00           | 1.31           | 1.38           | 4.33           | 4.30           | 5.89           | 7.50           |
| DSC in 0.075% chitosan + FS with 0.075%chitosan | 0.00              | 0.00           | 1.22           | 1.29           | 3.72           | 3.49           | 5.45           | 6.58           |
| DSC in 0.125% chitosan+ FS with 0.125%chitosan  | 0.00              | 0.00           | 1.12           | 1.23           | 3.39           | 3.03           | 5.11           | 5.46           |
| <b>LSD at 5 % level</b>                         | <b>--</b>         | <b>--</b>      | <b>NS</b>      | <b>NS</b>      | <b>1.10</b>    | <b>1.15</b>    | <b>1.18</b>    | <b>1.53</b>    |

DSC: Dipping stem cutting, FS: Foliar spraying, DSC+FS: Dipping stem cutting+ Foliar spraying