‘VL Tamatar 4’: New Tomato Cultivar for Open-field and Greenhouse Cultivation

Nirmal K. Hedau1, Shri Dhar, Vinay Mahajan, Pawan K. Agarwal, and Jagdish C. Bhatt

Vivekananda Parvatiya Krishi Anusandhan Sansthan (ICAR), Almora, Uttarakhand 263601 (India)

Additional index words. attractive red fruits, greenhouse cultivation, indeterminate growth, medium round, open field cultivation, organic farming, Solanum lycopersicum

‘VL Tamatar 4’ (Solanum lycopersicum or Lycopersicon esculentum Mill.) is a new tomato cultivar released for Agro-ecological Zone I (Uttarakhand, Northwest Himalaya, India). It was developed by a pure-line selection method from the exotic collection (EC-461691). It has an indeterminate growth habit. Fruits are smooth, round, and an attractive red color with 75 g average weight and having a thick pericarp resulting in a long storage life. It is suitable for cultivation under both open-field and greenhouse conditions as well. The average fruit yield was 20 to 30 tons per hectare and 55 to 65 tons per hectare under open-field and greenhouse conditions, respectively.

Tomato is a very important and economic crop of the Northwest Hills of India because it fetches a higher price as a result of its off-season cultivation. Farmers cultivate tomato during the spring–summer season, i.e., March to July, under open-field and the spring–fall season, i.e., April to October, under greenhouse conditions. A tomato breeding program in India was strengthened with the commencement of the All India Coordinated Research Project on Vegetable Crops (AICRP-VC) in 1971. Only one open-pollinated cultivar i.e., Pusa Ruby, has been released through AICRP-VC for cultivation in Agro-ecological Zone I (temperate zone) of India (Rai et al., 2004). As a result of the lack of the public sector’s improved cultivars of tomato, the private sector’s hybrids are being grown by the farmers on a large scale. Because of off-season cultivation and limited acreage in the Northwest Hills of India, the seed availability even the private sector’s hybrids is very poor as compared with main season tomato cultivations in other parts of the country. Seed dependency and high seed price are very serious problems of the region for off-season cultivation of tomato. Hence, through this article, we report the release of ‘VL Tamatar 4’, an open-pollinated cultivar with higher yields and better quality of the fruits. Being an open-pollinated cultivar, it can easily be multiplied and maintained by the farmers of the region and is suitable for organic as well as inorganic cultivation. This cultivar may be adapted to other temperate regions of the world having similar climatic conditions.

Origin

Indeterminate, autogamous, high-yielding genotypes with attractive fruits (medium, round, attractive red with a thick pericarp having a long storage life) were the major objectives of the tomato breeding program. In this endeavor, 41 accessions were evaluated at the experimental farm and followed the objectives of the tomato breeding program. For open-field conditions (Table 2). It also possesses resistance to fruit rot and seedling rot complex under field conditions. Because of its superiority over the popular cultivars in the pre-varietal trial, it was proposed to State Varietal Trials–Vegetable Crops (SVT-VC) of Uttarakhand, India. ‘VTG 93’ along with checks was evaluated in SVT-VC during 2003–05 at Haldwani, Almora (1250 m above sea level), Pithoragarh (1524 m above sea level), and Majhera, Nainital (900 m above sea level) under organic conditions. Evaluation under SVT-VC for 3 years (2003–05) indicated the suitability of ‘VTG 93’ for the midhills of Uttarakhand (900 to 1524 m above sea level) under organic conditions. Trials were planted (row distances 75 cm and plant to plant 45 cm) in an organic block of the experimental farm and followed the

Table 1. On-station performancez of tomato cultivars for fruit yield (t ha–1), 2002–03.

<table>
<thead>
<tr>
<th>Cultivars</th>
<th>2002</th>
<th>2003</th>
<th>Pooled mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLG 91</td>
<td>13.66</td>
<td>25.50</td>
<td>19.58 a</td>
</tr>
<tr>
<td>VL Tamatar 4</td>
<td>31.25</td>
<td>32.25</td>
<td>31.75 a</td>
</tr>
<tr>
<td>VLG 94</td>
<td>19.91</td>
<td>30.75</td>
<td>25.33 b</td>
</tr>
<tr>
<td>VTG 95</td>
<td>10.83</td>
<td>28.87</td>
<td>19.85 c</td>
</tr>
<tr>
<td>Sioux (C)</td>
<td>11.58</td>
<td>27.00</td>
<td>19.29 c</td>
</tr>
<tr>
<td>Pusa Ruby (C)</td>
<td>10.83</td>
<td>23.00</td>
<td>16.92 d</td>
</tr>
<tr>
<td>LSD (0.05)</td>
<td></td>
<td></td>
<td>2.35</td>
</tr>
</tbody>
</table>

*Data collected from a pre-varietal trial planted in a randomized complete block design with three replications under inorganic conditions.

Value within columns followed by the different letters are significantly different according to Duncan’s test at P ≤ 0.05.

C = control cultivar; LSD = least significant difference.

Table 2. On-station performance of *VL Tamatar 4* for fruit yield (t ha–1), 2002–04.

<table>
<thead>
<tr>
<th>Cultivars</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>Pooled mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLG 91</td>
<td>62.00</td>
<td>58.10</td>
<td>64.00</td>
<td>61.3 a</td>
</tr>
<tr>
<td>VLG 92</td>
<td>48.00</td>
<td>45.40</td>
<td>46.00</td>
<td>46.4 b</td>
</tr>
<tr>
<td>VTG 95</td>
<td>32.20</td>
<td>30.40</td>
<td>34.00</td>
<td>32.2 c</td>
</tr>
<tr>
<td>Roma (C)</td>
<td>29.00</td>
<td>28.00</td>
<td>29.80</td>
<td>28.9 d</td>
</tr>
<tr>
<td>Pusa Ruby (C)</td>
<td>25.00</td>
<td>24.00</td>
<td>26.00</td>
<td>25.0 e</td>
</tr>
<tr>
<td>LSD (0.05)</td>
<td></td>
<td></td>
<td></td>
<td>3.2</td>
</tr>
</tbody>
</table>

*Data collected from trials planted in randomized complete block designs under green house over the years in V.P.K.A.S., Haldwani, Almora, Uttarakhand.

Value within columns followed by the different letters are significantly different according to Duncan’s test at P ≤ 0.05.

C = control cultivar; LSD = least significant difference.
similar organic practices in which farm yard
manure was applied at 20 t·ha⁻¹ without any
chemicals (insecticide and fungicide). Fruit
yield of ‘VTG 93’ was significantly higher
than the other cultivars (Table 3). The trials
were conducted in the spring–summer sea-
sons and the average rainfall was 30 to 36 mm
and temperature was 25 to 35 °C (day) and 10
to 16 °C (night). Based on its performance in
SVT-VC Uttarakhand, it was identified and
recommended for release in the workshop of
the SVT-VC, Uttarakhand, held at GBPUA&T,
Pantnagar, on 6 Mar. 2006 for its release in
Uttarakhand. It was released as ‘VL
Tamatar 4’ for the midhills of Uttarakhand
(temperate, 900 to 1250 m above sea level) on 23 July
2008 at Dehradun by the State Vegetable
Variety Release Committee of Uttarakhand.
Finally, ‘VL Tamatar 4’ was notified during
the meeting of the Central Subcommittee on
Crop Standard Notification and release for
horticultural crops (The Gazette of India, 2010).

### Description

The plants of ‘VL Tamatar 4’ are charac-
terized by the indeterminate growth habit,
80- to 105-cm plant height, thick stem with
two to four primary branches, yellow flowers
with non-exserted style position, and 25 to 35
fruits per plant. Fruits are round, medium in
size, smooth surface, four to six locules per
cluster, four to five locules per fruit, and at-
tractive red fruits with 5-mm flesh thickness.

### Availability

Seeds of ‘VL Tamatar 4’ are being
multiplied every year and available at ICAR,
Almora, Uttarakhand, 263601 (India) for
Indian scientists and farmers. Seed requests
within India may be addressed to The
Director, Vivekananda Parvatiya Krishi
Anusandhan Sansthan, Almora, Uttarakhand
263601 (India). Seeds of ‘VL Tamatar 4’ have
also been deposited at the National Bureau
of Plant Genetic Resources (NBPGR), New
Delhi, under accession no. IC 565198. Seed
requests from outside India may be addressed
to the Director, National Bureau of Plant
Genetic Resources (ICAR), Pusa, New Delhi,
110012 (India).

### Literature Cited

Rai, M., S. Kumar, S. Pandey, M. Singh, and B.
Singh. 2004. Popular varieties of vegetable
crops in India. Technical Bulletin No. 27, IIVR,
Varanasi, p. 1–93.
The Gazette of India. 2010. Notification No. SO
1979 (E), 17-11-2009- SD IV, 12 Aug., Con-
troller of Publications, New Delhi, India.

---

Table 3. Performance of ‘VL Tamatar 4’ at State Varietal Trials–Vegetable Crops, Uttarakhand for fruit yield (t·ha⁻¹), 2003–05.

<table>
<thead>
<tr>
<th>Cultivars</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>Pooled mean</th>
<th>Percent increase of VL Tamatar 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>VL Tamatar 4 (VTG 93)</td>
<td>18.40</td>
<td>16.73</td>
<td>17.35</td>
<td>17.47 a</td>
<td>—</td>
</tr>
<tr>
<td>DARL 63 (Q)</td>
<td>16.01</td>
<td>12.21</td>
<td>15.22</td>
<td>14.58 b</td>
<td>+19.79</td>
</tr>
<tr>
<td>DARL 64 (Q)</td>
<td>13.72</td>
<td>11.30</td>
<td>15.72</td>
<td>13.89 b</td>
<td>+25.82</td>
</tr>
<tr>
<td>Pusa Ruby (C)</td>
<td>12.82</td>
<td>10.33</td>
<td>12.02</td>
<td>11.76 c</td>
<td>+48.52</td>
</tr>
<tr>
<td>VLT 1 (C)</td>
<td>14.42</td>
<td>14.96</td>
<td>15.44</td>
<td>15.01 b</td>
<td>+16.40</td>
</tr>
<tr>
<td>LSD (0.05)</td>
<td></td>
<td></td>
<td></td>
<td>2.11</td>
<td></td>
</tr>
</tbody>
</table>

Data collected from trials planted in randomized complete block designs over the years under organic conditions and locations (V.P.K.A.S., Hawalbagh, Almora, Uttarakhand, G.B.P.U.A.& T. Research Station, Majhira, Nainital, Uttarakhand, and D.A.R.L. Farm, Pithoragarh, Uttarakhand).

Value within columns followed by the different letters are significantly different according to Duncan’s test at P ≤ 0.05.

Number of locations in parentheses.
Q = qualifying entry; C = control cultivar; LSD = least significant difference.