Similar yield benefits of hybrid, conventional, and organic tomato and sweet pepper varieties under well-watered and drought-stressed conditions

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## Supplementary

**Annex 1: Variety list**

Organic tomato varieties: Sunviva, St. Pierre, Bogus Fruchta, Dorenia, and Trixi

Organic sweet pepper varieties: Fernec Tender, Liebesapfel, Yolo Wonder, Panthos, and Afrodita

Conventional tomato varieties: Ananas, Roma, Matina, Vilma, (and Pyros excluded)

Conventional sweet pepper varieties: Topgirl, Sweetgreen, Yollow California Wonder, Roter Augsburger, and Polka

Hybrid tomato varieties: HartzfeuerF1, VispolinoF1, RomelloF1, ArielleF1, and PozzanoF1

Hybrid sweet pepper varieties: ColettiF1, LozornoF1, PinokkioF1, SkytiaF1, and AmboyF1

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| **Tomato varieties** | | | |
| **Variety name** | **Plant and fruit type; fruit ripeness time** | **Approx. Fruit weight** | **Breeder and extra variety information** |
| **Organic varieties** | | | |
| Sunviva | Stake type; round, cherry tomato; yellow color; early ripeness | 20 g | Breeder: Dr. Bernd Horneburg (organic outdoor tomato cultivation / University Göttingen);  Open-source licensed |
| St. Pierre | Stake type; round, beef tomato; red color; medium ripeness | 100-150 g | Propagated by: Stefan Penov;  EU-Bio certification |
| Bogus Fruchta | Bush type; round, normal sized; red color; early ripeness | 40 g | Breeder: Kultursaat e.V. / Christoph Matthes;  Propagated by: Matthias Funk;  Demeter certification |
| Dorenia | Stake type; round, normal sized; red color; early/medium ripeness | Ca. 80 – 100 g | Breeder: Kultursaat e.V. / C. Matthes;  authorization: Amateur variety (AS) with official approval according to Directive 2009/145 / EC |
| Trixi | Cherry type; round, oval; red color; medium ripeness | 20 g | Breeder: Kultursaat e.V. / Silke Wedemeyer;  authorization: Amateur variety (AS) with official approval according to Directive 2009/145 / EC |
| **Conventional varieties** | | | |
| Ananas | Stake type; beef tomato; red color; medium ripeness | 200-300 g | *Kiepenkerl profi-line* for commercial and home-garden cultivation |
| Roma | Stake type; roma-, plum tomato; red color; medium/late ripeness | 80-90 g | *Kiepenkerl profi-line* for commercial and home-garden cultivation |
| Matina | Stake type; round, oval; red color; early ripeness | 50-100 g | *Kiepenkerl regional-historical line*;  breeder: Hild Seeds GmbH, Germany |
| Vilma | Bush type; round, cherry tomato; red color; medium ripeness | 15-20 g | *Kiepenkerl profi-line* for commercial and home-garden cultivation |
| **F1-Hybrid varieties** | | | |
| Harzfeuer F1 | Stake type; round/oval; red color; early/medium ripeness | 50-100 g | Breeder: Dr. Friedrich Fabig (East Germany - Quedlinburg 1961) |
| Vespolino F1 | Stake type; plum, cherry tomato; red color; early/medium ripeness | 30 g | *Kiepenkerl profi-line* for commercial and home-garden cultivation;  Breeder: Herlaar, Frits (Westwoud, NL)Mooij, Marcellinus Jacobus Johannes (Bovenkarspel, NL) 2011 -  United States Patent Application 20100306870 (<http://www.freepatentsonline.com/20100306870.pdf>);  robust against tomato mosaic virus, nematodes and Fusarium-wilt |
| Romello F1 | Bush type; plum, cherry tomato; red color; early/medium ripeness | 10-30 g | *Kiepenkerl profi-line* for commercial and home-garden cultivation;  Origin: Great Britain, 2013;  robust against blight and brown rot |
| Arielle F1 | Stake type; cherry tomato; red color; early/medium ripeness | 10-30 g | *Kiepenkerl profi-line* for commercial and home-garden cultivation |
| Pozzano F1 | Stake type; san Marzano type; red color; medium ripeness | 150 g | *Kiepenkerl profi-line* for commercial and home-garden cultivation;  Robust against tomato mosaic virus as well as Verticulum-, and Fusarium-wilt |

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| **Sweet pepper varieties** | | | |
| **Variety name** | **Plant height; fruit type; fruit color** | **Approx. fruit length or weight** | **Breeder, extra variety information** |
| **Organic varieties** | | | |
| Fernec Tender | Ca. 80 cm plant height; pointed fruit type; yellow/red color | 10-12 cm | Breeder: ReinSaat;  Propagated by: Stefan Penov;  EU Bio certification |
| Liebesapfel | Ca. 80 cm plant height; oval/round fruit type; red color | Ca. 150 g | Breeder: organic-dynamic conservational breeding;  Propagated by: Gärtnerhof Oldendorf, Hofgut Rengoldshausen / Ulrike Behrendt;  *Amateur-variety* |
| Yolo Wonder | Ca. 80 cm plant height; block fruit type; red color | Ca. 200 g | Breeder: organic-dynamic conservational breeding;  Propagated by: Azienda agricola Sol Ribaldo, Erdmuthe Weißer, Gärtnerei der Lebensgemeinschaft Bingenheim, Gärtnerei Piluweri, Hofgut Rengoldshausen, Sativa Rheinau, Vita Verde;  Bioland and Demeter certification |
| Panthos | Ca. 80 cm plant height, pointed fruit type, red color | 20 cm | Breeder: Kultursaat e.V. / R. Specht;  Propagated by: Matthias Funk, Gärtnerei Piluweri;  Demeter certification |
| Afrodita | Ca. 80 cm plan height; block type; yellow color | 200 g | Breeder: organic-dynamic conservational breeding;  Propagated by: Gärtnerei der Lebensgemeinschaft Höhenburg / Matthias Funk;  Demeter certification |
| **Conventional Varieties** | | | |
| Topgirl | 70-100 cm plant height; oval/round freuit type; red color | 100-150 g | *Kiepenkerl profi-line* for commercial and home-garden cultivation |
| Sweetgreen (E. 42.0088) | Ca. 70 cm plant height; block type; green color; high vitamin C content | 180-210 g | *Kiepenkerl profi-line* for commercial and home-garden cultivation;  Resistant against: Viruses, cracks, apical blossom end rot |
| Yellow California Wonder | Ca. 80 cm plant height; block type; yellow color | Ca. 200 g | *Kiepenkerl* standard line; |
| Roter Augsburger | Ca. 80 cm plant height; pointed type; red color | 12 cm | *Kiepenkerl profi-line* for commercial and home-garden cultivation;  Regional/historical variety |
| Polka | Ca. 80 cm plant height; block type; red color | Ca. 200 g | *N.L. Chrestensen* line;  Resistant against Tomato mosaic virus;  Cold-resistant |
| **F1-Hybrid varieties** | | | |
| Coletti F1 | Ca. 80 cm plant height; block type; yellow color | Ca 8-9 cm; 150-180 g | *Kiepenkerl profi-line* for commercial and home-garden cultivation;  Robust against tomato mosaic virus |
| Lozorno F1 | Ca. 70 cm plant height; block type; green-red color | Ca. 150 g | *Kiepenkerl standard line;*  Regional/historical variety |
| Pinokkio F1 | Ca. 80 cm plant height; pointed type, yellow-red color | Ca. 20 cm | *Kiepenkerl profi-line* for commercial and home-garden cultivation;  Resistant against tomato mosaic virus |
| Skytia F1 | 70-80 cm plant height; pointed type; white color | 12-18 cm | *Kiepenkerl standard line;*  Regional/historical variety |
| Amboy F1 | 80 cm plant height; pointed type, red color | 15 cm | *Kiepenkerl profi-line* for commercial and home-garden cultivation |

**Annex 2: location and climate data**

The city of Göttingen is located in the transitional area between maritime and continental climates of the temperate latitudes.

Coordinates: 51° 38' northern width

Height: 171 meter above sea level

Annual average temperature: 9.9 °C

Average total precipitation: 750.8 mm

Average temperature, daily maximum and minimum, day length and average relative humidity at the Göttingen site between March and October 2017. The data was taken from the Göttingen weather station database (see: <http://www.wetterstation-goettingen.de/wetterarchiv-2017.html>)

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| Month | Average temp. °C | T max. °C | T min. °C | Daylength | Average relative humidity (%) |
| March | 7.6 | 22.4 | -1.7 | 12 h | 77.3 |
| April | 7.7 | 21.8 | -3.8 | 14 h | 74.9 |
| May | 14.8 | 32.3 | 0.7 | 16 h | 75.1 |
| June | 17.5 | 33.2 | 7.4 | 17 h | 76.2 |
| July | 18.1 | 32.4 | 9.1 | 16.5 h | 79.1 |
| August | 17.3 | 29.1 | 5.7 | 14.5 h | 79.4 |
| September | 12.9 | 22.6 | 3.0 | 13 h | 83.5 |
| October | 11.5 | 22.3 | 5.0 | 10.5 | 87.2 |