

Supplementary

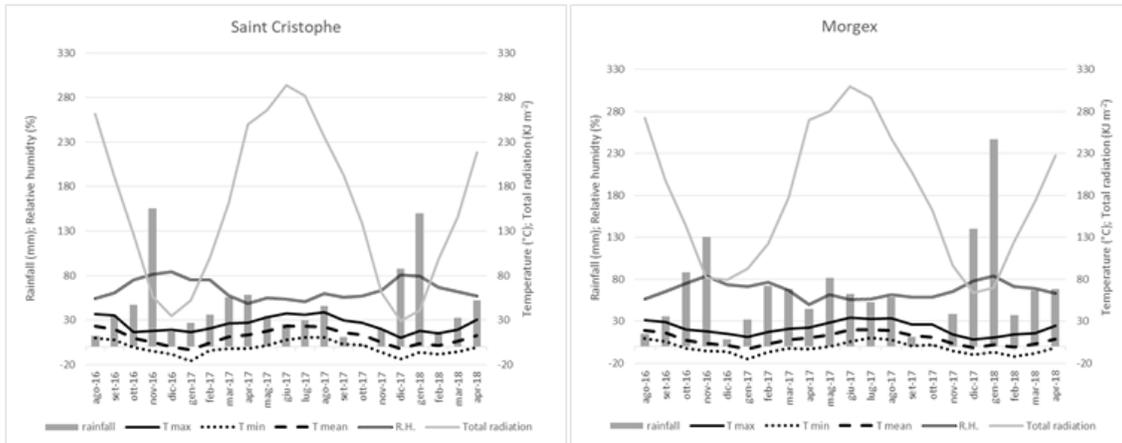


Figure S1. Climatic conditions of the Alpine experimental sites.

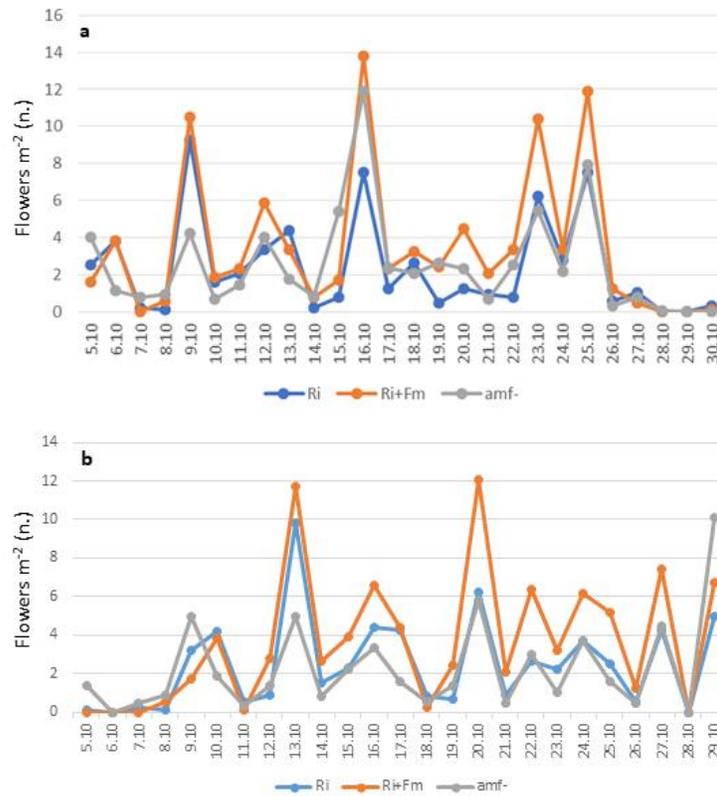


Figure S2. Effects of AMF inoculum composed by *Rhizophagus intraradices* and *Funneliformis mosseae* (Ri + Fm), *R. intraradices* alone (Ri), or control (AMF-) on flower production m^{-2} during the first (a) and second (b) cultivation cycle.

Table S1. Physical and chemical properties of the soils collected in the three saffron experimental fields located in the municipality of Saint Cristophe and Morgex (north west Italy).

| | | Saint Cristophe | Morgex |
|--|-----------------|------------------------|---------------|
| Texture | Clay (%) | 3.7 | 3.8 |
| | Fine Silt (%) | 21.8 | 21.0 |
| | Coarse Silt (%) | 20.2 | 14.4 |
| | Fine Sand (%) | 24.3 | 25.0 |
| | Coarse Sand (%) | 29.9 | 35.8 |
| Bulk density (g L ⁻¹) | 1123.7 | 1075.6 | |
| Moisture (%) | 17.3 | 20.2 | |
| P Olsen (mg Kg ⁻¹) | 69.2 | 113.0 | |
| pH | 6.9 | 7.4 | |
| Electrical conductivity (μS/cm ⁻¹) | 316 | 243 | |
| N tot (%) | 0.31 | 0.23 | |
| C tot (%) | 3.50 | 3.79 | |
| Cation-exchange capacity (meq 100g ⁻¹) | 19.2 | 15.7 | |
| Exchangeable Ca (meq 100g ⁻¹) | 17.31 | 16.61 | |
| Exchangeable K (meq 100g ⁻¹) | 1.47 | 0.53 | |
| Exchangeable Mg (meq 100g ⁻¹) | 1.90 | 0.76 | |

Table S2. Characteristics of the HPLC methods applied to analyse the bioactive compounds present in the studied saffron samples.

| HPLC Method | Class | Standard | Stationary Phase | Mobile Phase | Flow (mL min ⁻¹) | Time (min) | Gradient | Wavelength (nm) |
|-------------|----------------------|--|--|---|------------------------------|--------------|----------|-----------------|
| α | Cinnamic acids | caffeic acid chlorogenic acid coumaric acid ferulic acid hyperoside isoquercitrin | KINETEX – C18 column (4.6 × 150mm, 5 μm) | A: 10mM KH ₂ PO ₄ /H ₃ PO ₄ , pH=2.8 B: CH ₃ CN | 1.5 | 20 + 2 (CT) | yes | 330 |
| | Flavonols | quercetin quercitrin rutin | | | | | | |
| β | Benzoic acids | ellagic acid gallic acid | KINETEX – C18 column (4.6 × 150mm, 5 μm) | A: H ₂ O/CH ₃ OH/HCOOH (5:95:0.1 v/v/v), pH=2.5 B: CH ₃ OH/HCOOH (100:0.1 v/v) | 0.6 | 23 + 2 (CT) | yes | 280 |
| | Catechins Tannins | catechin epicatechin castalagin vescalagin | | | | | | |
| γ | Carotenoids | crocin I crocin II safranal | KINETEX – C18 column (4.6 × 150mm, 5 μm) | A: H ₂ O B: CH ₃ CN | 0.6 | 35 + 10 (CT) | yes | 310, 441 |
| δ | Vitamin C | ascorbic acid dehydroascorbic acid | KINETEX – C18 column (4.6 × 150mm, 5 μm) | A: 5 mM C ₁₆ H ₃₃ N(CH ₃) ₃ Br/50 mM KH ₂ PO ₄ , pH=2.5 B: CH ₃ OH | 0.9 | 10 + 5 (CT) | no | 261, 348 |

* CT = conditioning time. Method α—gradient analysis: 5% B to 21% B in 17 min + 21% B in 3 min + 2 min of conditioning time. Method β—gradient analysis: 3% B to 85% B in 22 min + 85% B in 1 min + 2 min of conditioning time. Method γ - gradient analysis: 5%B to 95%B in 30 min + 95%B to 5%B in 5 min + 10 min of conditioning time. Method δ - isocratic analysis: 10 min + 5 min of conditioning time.