**Responses of Soil Seedbank and Aboveground Weed Communities to Globe Artichoke Cropping Systems: an On-Farm Analysis**

Aurelio Scavo1, Alessia Restuccia1, Alessandro Di Martino1, Giovanni Mauromicale1

1 Department of Agriculture, Food, and Environment (Di3A), University of Catania, 95123 Catania, Italy.

\* Author for correspondence: Aurelio Scavo; Email: aurelio.scavo@unict.it

**Supplementary Table S1**. Geographical coordinates and agronomic management of all farms under study.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Farm** | **Geographical coordinates** | **Tillage** | **Type and time of fertilization** | **Active ingredient used for weed chemical control** |
| **1) ART** |  |  |  |  |
| *Buccheri 1* | 37°0'10.966"N, 14°22'52.194"E | Motocultivator after summer regrowth | Fertigation schedule from September with humic acids, seaweed, magnesium, potassium and calcium nitrate | Pyraflufen-ethyl (PiraMax EC); fluazifop-p-butyl (Belgard); oxyfluorfen (Wirk) |
| *Pepi* | 37°4'3.878"N, 14°27'12.46"E | / | Organic fertigation schedule from August with NPK fertilizer, organic matter and magnesium, potassium and calcium nitrate | / |
| *Blanco 1* | 37°7'40.004"N, 14°20'21.242"E | Harrowing (‒10 cm) on September | / | Pyraflufen-ethyl (PiraMax EC); fluazifop-p-butyl (Fusilade max); oxyfluorfen (Goal) |
| **2) past-ART** |  |  |  |  |
| *Di Modica* | 37°7'35.321"N, 14°26'32.705"E | / | / | / |
| *Buccheri 2* | 37°0'16.182"N, 14°23'12.685"E | Ploughing (‒20 cm) on September | / | / |
| *Blanco 2* | 37°7'40.004"N, 14°20'21.242"E | Motocultivator on August | / | / |
| **3) ART-WHEAT** |  |  |  |  |
| *Minardi 1* | 37°11'53.124"N, 14°18'53.705"E | Rotary tiller on October | Fertigation schedule from September with ammonium, potassium, magnesium and calcium nitrate, phosphate urea, humic acids and microelements  | Pyraflufen-ethyl (PiraMax EC); fluazifop-p-butyl (Fusilade max) |
| *Minardi 2* | 37°11'49.79"N, 14°19'4.418"E | Rotary tiller on October | Fertigation schedule from September with ammonium, potassium, magnesium and calcium nitrate, phosphate urea, humic acids and microelements | Pyraflufen-ethyl (PiraMax EC); fluazifop-p-butyl (Fusilade max) |
| *Alessandrello* | 37°1'29.978"N, 14°26'36.686"E | Harrowing (−25 cm) on November | / | / |
| *Lo Iacono* | 37°9'42.44"N, 14°20'26.614"E | Harrowing (−25 cm) on November | / | / |
| **4) CONTROL** |  |  |  |  |
| *Di Martino A.* | 37°9'21.28"N, 14°26'20.483"E | Subsoiling (−15 cm) on January and field bean green manure on March |  | / |
| *Di Martino F. 1* | 37°8'45.769"N, 14°25'43.356"E | Subsoiling (−15 cm) on April-May | / | / |
| *Di Martino F. 2* | 37°8'4.027"N, 14°25'30.36"E | Subsoiling (−15 cm) on April-May | / | / |

**Supplementary Table S2.** Eigenvectors and eigenanalysis of the first three principal components (PCs) on 13 variables (7 major weeds for the soil seedbank and 6 for aboveground weeds) from the correlation matrix. The variables with the largest influence for each PC are in bold.

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Weed soil seedbank** |  | **AbovegroundwWeeds** |
| **PC1** | **PC2** | **PC3** |  | **PC1** | **PC2** | **PC3** |
| AMAR | **0.406** | -0.326 | 0.322 |  | − | − | − |
| ANGAR | 0.026 | **0.608** | 0.273 |  | − | − | − |
| CHENAL | -0.073 | **-0.622** | -0.269 |  | -0.002 | **-0.913** | -0.033 |
| CONVAR | − | − | − |  | -0.326 | 0.173 | **0.752** |
| CYNDAC | − | − | − |  | **0.474** | 0.196 | 0.125 |
| DACAEG | − | − | − |  | **0.547** | -0.041 | -0.001 |
| DIPERU | − | − | − |  | **0.472** | 0.177 | -0.123 |
| FALCO  | **-0.483** | -0.086 | -0.091 |  | − | − | − |
| FUMAR | -0.427 | -0.047 | **0.625** |  | − | − | − |
| PORTOL | **0.574** | -0.148 | 0.355 |  | − | − | − |
| SILENE | 0.291 | 0.325 | **-0.474** |  | − | − | − |
| STELME | − | − | − |  | -0.384 | 0.257 | **-0.635** |
| Eigenvalue | 2.378 | 2.221 | 1.065 |  | 2.702 | 1.693 | 1.178 |
| % Variance | 34.0 | 31.7 | 15.2 |  | 45.1 | 19.9 | 19.2 |
| % Cumulative variance | 34.0 | 65.7 | 81.0 |  | 45.1 | 65.0 | 84.1 |

AMAR (*Amaranthus retroflexus*); ANGAR (*Anagallis arvensis*); CHENAL (*Chenopodium album*); CONVAR (*Convolvulus arvensis*); CYNDAC (*Cynodon dactylon*); DACAEG (*Dactyloctenium aegyptium*); DIPERU (*Diplotaxis erucoides*); FALCO (*Fallopia convolvulus*); FUMAR (*Fumaria* sp.); PORTOL (*Portulaca oleracea*); SILENE (*Silene* sp.); STELME (*Stellaria media*).



**Supplementary Fig. S1.** Total rainfall, maximum and minimum monthly temperatures during the 2021/2022 growing season in the experimental area (Niscemi, Caltanissetta, southern Italy).