

# Antioxidant Potential and Phenolic Acid Profiles in Triticale Grain Under Integrated and Conventional Cropping Systems

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**Table S1.** Three-factor analysis of variance (ANOVA) about the effects of triticale growing seasons (Y; 2019/2020-2021/2022), cultivar (C; Belcanto, Meloman, Panteon), and cropping systems (CS; integrated (INTEG) and conventional (CONV) system), and their bi-/tri -interactions on phenolic acids (PA) content in triticale (whole grain, flour and bran) (F/P value) – for year averages.

| Factors | TPAs           |                |                 | p-HB          |                |                | SYR            |                |                | p- COU         |                |                | FER             |                |                | SIN            |                |                 |
|---------|----------------|----------------|-----------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|----------------|----------------|----------------|----------------|-----------------|
|         | Whole grain    | Flour          | Bran            | Whole grain   | Flour          | Bran           | Whole grain    | Flour          | Bran           | Whole grain    | Flour          | Bran           | Whole grain     | Flour          | Bran           | Whole grain    | Flour          | Bran            |
| C       | 272.9 / 0.0000 | 39.32 / 0.0000 | 746.1 / 0.0000  | 1.17 / 0.3337 | 4.41 / 0.0277  | 23.63 / 0.0000 | 0.14 / 0.8681  | 29.98 / 0.0000 | 0.46 / 0.6381  | 20.66 / 0.0000 | 9.65 / 0.0014  | 36.87 / 0.0000 | 2597.2 / 0.0000 | 590.6 / 0.0000 | 599.5 / 0.0000 | 59.29 / 0.0000 | 25.58 / 0.0000 | 944.0 / 0.0000  |
| CS      | 4.30 / 0.0528  | 10.48 / 0.0046 | 380.0 / 0.0000  | 3.83 / 0.0659 | 43.85 / 0.0000 | 0.17 / 0.6838  | 4.51 / 0.0478  | 0.36 / 0.5554  | 7.44 / 0.0138  | 0.01 / 0.9209  | 0.355 / 0.5589 | 3.21 / 0.0901  | 17.5 / 0.0006   | 0.76 / 0.3943  | 90.6 / 0.0000  | 3.56 / 0.0753  | 5.13 / 0.0361  | 395.3 / 0.0000  |
| Y       | 44.59 / 0.0000 | 0.78 / 0.4735  | 1487.9 / 0.0000 | 1.80 / 0.1945 | 18.20 / 0.0000 | 22.08 / 0.0000 | 16.08 / 0.0001 | 65.54 / 0.0000 | 4.54 / 0.0254  | 0.94 / 0.4095  | 0.820 / 0.4562 | 15.72 / 0.0001 | 544.1 / 0.0000  | 416.7 / 0.0000 | 638.7 / 0.0000 | 28.87 / 0.0000 | 29.44 / 0.0000 | 1029.0 / 0.0000 |
| CxCS    | 30.66 / 0.0000 | 2.96 / 0.0772  | 67.2 / 0.0000   | 0.15 / 0.8617 | 6.76 / 0.0064  | 37.90 / 0.0000 | 23.08 / 0.0000 | 2.78 / 0.0884  | 2.78 / 0.0889  | 0.41 / 0.6668  | 0.675 / 0.5215 | 11.63 / 0.0006 | 162.1 / 0.0000  | 17.63 / 0.0001 | 241.2 / 0.0000 | 5.67 / 0.0123  | 0.10 / 0.9089  | 101.6 / 0.0000  |
| CxY     | 30.90 / 0.0000 | 1.24 / 0.3285  | 423.8 / 0.0000  | 2.83 / 0.0556 | 4.27 / 0.0132  | 4.16 / 0.0148  | 7.18 / 0.0012  | 7.43 / 0.0010  | 2.24 / 0.1051  | 4.61 / 0.0098  | 0.538 / 0.7100 | 16.79 / 0.0000 | 83.4 / 0.0000   | 17.42 / 0.0000 | 208.1 / 0.0000 | 44.64 / 0.0000 | 5.72 / 0.0038  | 313.9 / 0.0000  |
| CSxY    | 1.90 / 0.1785  | 19.61 / 0.0000 | 8.8 / 0.0022    | 0.47 / 0.6333 | 28.00 / 0.0000 | 2.23 / 0.1365  | 2.80 / 0.0872  | 23.44 / 0.0000 | 11.17 / 0.0007 | 0.16 / 0.8520  | 2.887 / 0.0818 | 12.30 / 0.0004 | 43.0 / 0.0000   | 6.18 / 0.0091  | 20.0 / 0.0000  | 11.88 / 0.0005 | 22.40 / 0.0000 | 56.9 / 0.0000   |
| CxCSxY  | 21.01 / 0.0000 | 3.74 / 0.0219  | 26.7 / 0.0000   | 4.01 / 0.0170 | 2.50 / 0.0790  | 8.20 / 0.0006  | 4.74 / 0.0087  | 6.54 / 0.0020  | 4.89 / 0.0076  | 4.77 / 0.0084  | 0.463 / 0.7617 | 4.72 / 0.0088  | 169.5 / 0.0000  | 12.49 / 0.0000 | 86.5 / 0.0000  | 9.38 / 0.0003  | 2.48 / 0.0808  | 38.3 / 0.0000   |

TPAs—total content of phenolic acids, p-HB—p-hydroxybenzoic acid, SYR—syringic acid, p-COU—p-coumaric acid, FER—ferulic acid, SIN—sinapic acid.

**Table S2.** Three-factor analysis of variance (ANOVA) about the effects of triticale growing seasons (Y; 2019/2020-2021/2022), cultivar (C; Belcanto, Meloman, Panteon), and cropping systems (CS; integrated (INTEG) and conventional (CONV) system), and their bi-/tri -interactions on antioxidant activity in triticale (whole grain, flour and bran) (F/P value) – for year averages.

| Factors | TPC            |                |                | TROLOX          |                 |               | DPPH            |                 |               |
|---------|----------------|----------------|----------------|-----------------|-----------------|---------------|-----------------|-----------------|---------------|
|         | Whole grain    | Flour          | Bran           | Whole grain     | Flour           | Bran          | Whole grain     | Flour           | Bran          |
| C       | 35.24 / 0.0000 | 26.88 / 0.0000 | 17.23 / 0.0001 | 201.38 / 0.0000 | 136.96 / 0.0000 | 28.9 / 0.0000 | 199.30 / 0.0000 | 136.29 / 0.0000 | 33.7 / 0.0000 |
| CS      | 0.11 / 0.7432  | 15.40 / 0.0010 | 1.49 / 0.2381  | 3.07 / 0.0969   | 6.32 / 0.0217   | 29.0 / 0.0000 | 2.59 / 0.1251   | 6.31 / 0.0218   | 31.0 / 0.0000 |
| Y       | 8.32 / 0.0028  | 15.08 / 0.0001 | 20.40 / 0.0000 | 105.47 / 0.0000 | 125.15 / 0.0000 | 34.2 / 0.0000 | 102.13 / 0.0000 | 129.56 / 0.0000 | 64.0 0.0000/  |
| CxCS    | 4.87 / 0.0204  | 19.63 / 0.0000 | 7.39 / 0.0046  | 8.25 / 0.0029   | 14.59 / 0.0002  | 17.0 / 0.0001 | 8.55 / 0.0024   | 13.56 / 0.0003  | 18.4 / 0.0000 |

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|--------|---------------|----------------|----------------|----------------|----------------|---------------|----------------|----------------|---------------|
| CxY    | 3.12 / 0.0411 | 49.15 / 0.0000 | 13.48 / 0.0000 | 21.91 / 0.0000 | 19.04 / 0.0000 | 43.9 / 0.0000 | 21.61 / 0.0000 | 19.18 / 0.0000 | 33.6 / 0.0000 |
| CSxY   | 3.00 / 0.0752 | 34.45 / 0.0000 | 0.88 / 0.4321  | 5.96 / 0.0103  | 12.03 / 0.0005 | 7.1 / 0.0054  | 6.27 / 0.0086  | 12.25 / 0.0004 | 9.2 / 0.0017  |
| CxCSxY | 9.09 / 0.0003 | 13.68 / 0.0000 | 1.65 / 0.2050  | 12.51 / 0.0000 | 8.59 / 0.0005  | 2.4 / 0.0852  | 12.18 / 0.0001 | 8.94 / 0.0004  | 4.2 / 0.0146  |

TPC - total phenolic content [mg GAE·g<sup>-1</sup>], AOA - antioxidant activity [mg TROLOX·g<sup>-1</sup> and DDPH % inhibition]