

# Supporting Information

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Table S1. Archaeological sites and modern locations from where the barley grains were taken for  $\delta^{13}\text{C}$  analysis

| Site                               | Modern political geography | Map no. | Cultural typology            | Chronological range (mean values)               | Geographic latitude | Geographic longitude | No. of barley grains measured | No. of contextual units | Mean $\Delta^{13}\text{C}$ , ‰ | Minimum $\Delta^{13}\text{C}$ , ‰ |
|------------------------------------|----------------------------|---------|------------------------------|---|---------------------|----------------------|-------------------------------|-------------------------|--------------------------------|-----------------------------------|
| Küçüksu (RMIN_1815) <sup>A</sup>   | Turkey                     | 49      | Modern                       | Modern  | 41.5000000          | 33.7166700           | 6                             | 1                       | 17.4278312                     | 16.7133974                        |
| Tell Snan (GPS_437) <sup>B</sup>   | Syria                      | 42      | Modern                       | A.D. 1990                                       | 34.8780000          | 36.1170000           | 8                             | 1                       | 16.2451017                     | 15.653579                         |
| Membij (GPS_629) <sup>B</sup>      | Syria                      | 44      | Modern                       | A.D. 2000                                       | 36.4270000          | 37.6520000           | 12                            | 1                       | 14.4210374                     | 14.2732033                        |
| Chagar Bazar <sup>B</sup>          | Syria                      | 37      | Modern                       | A.D. 1998                                       | 36.8755930          | 40.8977090           | 5                             | 1                       | 16.2779377                     | 15.5812528                        |
| Zebdani (GPS_152) <sup>B</sup>     | Syria                      | 38      | Modern                       | A.D. 2000                                       | 33.7480000          | 36.1170000           | 16                            | 1                       | 15.6544162                     | 13.5358581                        |
| Tell Mozan <sup>B</sup>            | Syria                      | 35      | Modern                       | A.D. 1998                                       | 37.1200000          | 40.9300000           | 5                             | 1                       | 16.602726                      | 15.5801282                        |
| Tell Leilan <sup>B</sup>           | Syria                      | 52      | Modern                       | A.D. 1998                                       | 36.9500000          | 41.5000000           | 3                             | 1                       | 16.4333092                     | 16.3639864                        |
| Tell Brak (GPS_828) <sup>B</sup>   | Syria                      | 46      | Modern                       | A.D. 2000                                       | 36.6660000          | 41.0560000           | 13                            | 1                       | 14.9521949                     | 14.1634173                        |
| Tell Abyad (GPS_755) <sup>B</sup>  | Syria                      | 45      | Modern                       | A.D. 2000                                       | 36.6469000          | 39.0460000           | 11                            | 1                       | 14.3295985                     | 13.820599                         |
| GPS_17 <sup>B</sup>                | Syria                      | 39      | Modern                       | A.D. 2000                                       | 32.8700000          | 36.6600000           | 16                            | 1                       | 15.1682793                     | 14.7763616                        |
| Summakiak (GPS_50) <sup>B</sup>    | Syria                      | 43      | Modern                       | A.D. 2000                                       | 32.4280000          | 36.4050000           | 8                             | 1                       | 13.8084402                     | 13.3088459                        |
| Tell Bderi <sup>B</sup>            | Syria                      | 51      | Modern                       | A.D. 1998                                       | 36.3700000          | 40.8100000           | 11                            | 1                       | 14.4114219                     | 14.0474723                        |
| Malhat ed Deru <sup>B</sup>        | Syria                      | 48      | Modern                       | A.D. 1998                                       | 35.9333300          | 40.3500000           | 15                            | 2                       | 14.6340433                     | 14.1612345                        |
| Chogha Golan <sup>C</sup>          | Iran                       | 5       | Aceramic                     | Early to Mid Holocene                           | 33.3775167          | 46.2709694           | 73                            | 13                      | 16.4047766                     | 14.1555426                        |
| Mezraa Teleilat Höyük <sup>D</sup> | Turkey                     | 14      | PPN-middle PN                | 6900–6000 B.C.                                  | 36.9705600          | 37.9976841           | 22                            | 3                       | 17.0934626                     | 15.4317058                        |
| Ain Rahub <sup>D</sup>             | Jordan                     | 2       | Yarmoukian                   | 6300–6200 B.C.                                  | 32.6319440          | 35.9397220           | 10                            | 1                       | 17.1740884                     | 16.5457897                        |
| Tell Tawila <sup>C</sup>           | Syria                      | 28      | Middle to Late Halaf period  | 5600–5400 B.C.                                  | 36.5166600          | 39.5000000           | 41                            | 4                       | 16.7560397                     | 14.4459038                        |
| Umm Qseir <sup>E</sup>             | Syria                      | 31      | Halaf period                 | 5400–4800 B.C.                                  | 36.3800000          | 40.8500000           | 7                             | 2                       | 16.5917478                     | 15.1966003                        |
| Mashnaqa <sup>E</sup>              | Syria                      | 13      | Ubaid period                 | 5200–4900 B.C.                                  | 36.2884250          | 40.7946400           | 13                            | 3                       | 16.6678529                     | 15.0184718                        |
| Shir <sup>D</sup>                  | Syria                      | 18      | Late Neolithic               | 5000–4200 B.C.                                  | 35.1994400          | 36.6222200           | 8                             | 3                       | 16.9035724                     | 15.7896108                        |
| Tell Kuran <sup>E</sup>            | Syria                      | 26      | Ubaid period                 | 4700–4600 B.C.                                  | 36.5854800          | 40.4162100           | 14                            | 3                       | 16.9372479                     | 14.0463225                        |
| Ziyade <sup>E</sup>                | Syria                      | 36      | PN                           | 4700–4300 B.C.                                  | 36.4300000          | 40.8333300           | 26                            | 5                       | 16.3803884                     | 13.7107012                        |
| Abu Hamid <sup>D</sup>             | Jordan                     | 1       | Late Neolithic/ Chalcolithic | 4600–4000 B.C.                                  | 32.3200000          | 35.5500000           | 19                            | 3                       | 17.1991992                     | 14.6805142                        |
| Tell Beydar III <sup>D</sup>       | Syria                      | 22      | Late Chalcolithic            | 4300–3700 B.C.                                  | 36.7377780          | 40.5869440           | 40                            | 4                       | 16.9713472                     | 13.6524815                        |
| Tell esh-Shuna <sup>D</sup>        | Jordan                     | 19      | EB I to Late Chalcolithic    | Early Bronze Age (first half)<br>3950–3200 B.C. | 32.6500000          | 35.6800000           | 12                            | 2                       | 15.971836                      | 13.6442486                        |
| Tell Shioukh Faouqani              | Syria                      | 17      | EB I to Late Chalcolithic    | 3300–3000 B.C.                                  | 36.7800000          | 38.0300000           | 5                             | 1                       | 15.6967428                     | 14.9149593                        |
| Qatna <sup>C</sup>                 | Syria                      | 34      | Early Bronze Age (Midlate)   | 3000–2500 B.C.                                  | 34.8500000          | 36.8500000           | 55                            | 6                       | 16.5809126                     | 14.8992724                        |
| Tell 'el Abd <sup>C</sup>          | Syria                      | 33      | Early Bronze Age             | 3000–2500 B.C.                                  | 36.2500000          | 38.1800000           | 23                            | 4                       | 17.5602882                     | 14.3606798                        |
| Hirbet ez-Zeraqon <sup>C</sup>     | Jordan                     | 9       | Early Bronze Age II-III      | 3000–2500 B.C.                                  | 32.6000000          | 35.9300000           | 24                            | 8                       | 16.7987388                     | 13.9408697                        |
| Tell Fadous <sup>C</sup>           | Lebanon                    | 23      | Early Bronze Age             | 2900–2600 B.C.                                  | 34.2800000          | 35.6500000           | 10                            | 3                       | 18.0826367                     | 16.4923021                        |
| Tell Raqar <sup>E</sup>            | Syria                      | 27      | Early Bronze Age             | 2800–2600 B.C.                                  | 36.4300000          | 40.8700000           | 38                            | 6                       | 16.7516628                     | 13.8541721                        |
| Tell Atij <sup>E</sup>             | Syria                      | 21      | Early Bronze Age             | 2800–2500 B.C.                                  | 36.4300000          | 40.8500000           | 26                            | 3                       | 16.3970733                     | 14.0835974                        |
| Tell Kerma <sup>E</sup>            | Syria                      | 25      | Early Bronze Age             | 2900–2500 B.C.                                  | 36.5200000          | 40.8000000           | 16                            | 3                       | 15.877439                      | 14.0911499                        |

Table S1. Cont.

| Site                           | Modern political geography | Map no. | Cultural typology                  | Chronological range (mean values)                | Geographic latitude | Geographic longitude | No. of barley grains measured | No. of contextual units | Mean $\Delta^{13}\text{C}$ , ‰ | Minimum $\Delta^{13}\text{C}$ , ‰ |
|--------------------------------|----------------------------|---------|------------------------------------|--|---------------------|----------------------|-------------------------------|-------------------------|--------------------------------|-----------------------------------|
| Tell Mozan <sup>C</sup>        | Syria                      | 35      | Early Bronze Age (FG III)          | ca. 2500 B.C.                                    | 37.1200000          | 40.9300000           | 12                            | 4                       | 17.5066028                     | 16.5190836                        |
| Emar <sup>C</sup>              | Syria                      | 7       | Early Bronze Age (Midlate)         | Early Bronze Age (second half)<br>2400–2100 B.C. | 36.0300000          | 38.0800000           | 11                            | 2                       | 16.1545588                     | 14.0074217                        |
| Dilkaya Höyük <sup>A</sup>     | Turkey                     | 6       | EBA II-III                         | 2400–2000 B.C.                                   | 38.3600000          | 43.1400000           | 28                            | 3                       | 16.2902791                     | 13.879441                         |
| Kinet Höyük <sup>C</sup>       | Turkey                     | 12      | Early Bronze Age (Late)            | ca. 2200 B.C.                                    | 36.9300000          | 36.1200000           | 3                             | 1                       | 17.9847156                     | 17.4322203                        |
| Tell Tweini <sup>F</sup>       | Syria                      | 29      | Early Bronze Age (Late)            | ca. 2100 B.C.                                    | 35.3716700          | 35.9363900           | 4                             | 1                       | 16.9128464                     | 15.8698437                        |
| Tell Mozan <sup>C</sup>        | Syria                      | 35      | EBA/MBA                            | 2100–2000 B.C.                                   | 37.1200000          | 40.9300000           | 18                            | 3                       | 16.8412607                     | 15.5801282                        |
| Qatna <sup>C</sup>             | Syria                      | 34      | (FG IV-AG I)<br>EBA/MBA transition | ca. 2000 B.C.                                    | 34.8500000          | 36.8500000           | 10                            | 1                       | 15.6886883                     | 14.7872857                        |
| Emar <sup>C</sup>              | Syria                      | 7       | Middle Bronze Age                  | Middle Bronze Age                                | 36.0300000          | 38.0800000           | 11                            | 2                       | 15.7095316                     | 13.4911378                        |
| Qatna <sup>C</sup>             | Syria                      | 34      | Middle Bronze Age                  | 1900–1700 B.C.                                   | 34.8500000          | 36.8500000           | 71                            | 9                       | 16.6744239                     | 13.7663444                        |
| Kinet Höyük <sup>C</sup>       | Turkey                     | 12      | Middle Bronze Age                  | ca. 1800 B.C.                                    | 36.9300000          | 36.1200000           | 20                            | 4                       | 17.3527386                     | 15.9177324                        |
| Tell Tweini <sup>F</sup>       | Syria                      | 29      | Middle Bronze Age (I)              | 1800–1600 B.C.                                   | 35.3716700          | 35.9363900           | 15                            | 3                       | 16.9373373                     | 15.4898488                        |
| Tell Shioikh Faouqani          | Syria                      | 17      | Middle/Late Bronze Age             | Late Bronze Age                                  | 36.7800000          | 38.0300000           | 4                             | 1                       | 16.4832731                     | 14.1582062                        |
| Bogazköy <sup>P</sup>          | Turkey                     | 3       | LBA (Hittite)                      | 1600–1500 B.C.                                   | 40.0200000          | 34.6700000           | 25                            | 3                       | 16.9653747                     | 15.5848741                        |
| Tell Tweini <sup>F</sup>       | Syria                      | 29      | LBA II                             | 1300–1100 B.C.                                   | 35.3716700          | 35.9363900           | 8                             | 2                       | 17.0891655                     | 16.1197576                        |
| Tell Atchana <sup>C</sup>      | Turkey                     | 20      | Late Bronze Age                    | 1400–1200 B.C.                                   | 36.3200000          | 36.4800000           | 22                            | 6                       | 17.3974213                     | 15.3409571                        |
| Emar <sup>C</sup>              | Syria                      | 7       | Late Bronze Age                    | 1400–1200 B.C.                                   | 36.0300000          | 38.0800000           | 8                             | 2                       | 16.0324325                     | 14.2120876                        |
| Qatna <sup>C</sup>             | Syria                      | 34      | Late Bronze Age                    | ca. 1400 B.C.                                    | 34.8500000          | 36.8500000           | 4                             | 1                       | 15.9835062                     | 15.3197609                        |
| Tell Shioikh Faouqani          | Syria                      | 17      | Late Bronze Age I                  | 1200–1100 B.C.                                   | 36.7800000          | 38.0300000           | 5                             | 1                       | 16.9625731                     | 15.9102458                        |
| Tell Halaf <sup>C</sup>        | Syria                      | 24      | Iron Age IA-IIB/C                  | Iron Age   | 36.8261911          | 40.0395045           | 42                            | 3                       | 16.4965324                     | 14.6058829                        |
| Tell Tweini <sup>F</sup>       | Syria                      | 29      | Iron Age I/II                      | 1050–850 B.C.                                    | 35.3716700          | 35.9363900           | 6                             | 2                       | 17.411873                      | 16.1442538                        |
| Gordion <sup>A</sup>           | Turkey                     | 8       | Iron Age (early)                   | 1050–800 B.C.                                    | 39.6501033          | 31.9785698           | 30                            | 2                       | 16.3328641                     | 13.3373176                        |
| Qubur al-Walayida <sup>C</sup> | Israel                     | 16      | Iron Age I-II                      | 1000–950 B.C.                                    | 31.4125000          | 34.5341670           | 10                            | 1                       | 16.6558228                     | 15.5336492                        |
| Nerik <sup>C</sup>             | Turkey                     | 15      | Iron Age                           | 1000–700 B.C.                                    | 41.1833300          | 35.4333300           | 23                            | 3                       | 17.1205405                     | 15.2392384                        |
| Kamid el-Loz <sup>C</sup>      | Lebanon                    | 11      | Iron Age I-II                      | ca. 950 B.C.                                     | 33.6238185          | 35.8214337           | 11                            | 1                       | 16.3199706                     | 15.1930562                        |
| Tell Shioikh Faouqani          | Syria                      | 17      | Iron Age II                        | 900–700 B.C.                                     | 36.7800000          | 38.0300000           | 5                             | 1                       | 16.8126565                     | 14.5074214                        |
| Tel Burna <sup>C</sup>         | Israel                     | 53      | Iron Age                           | 750–500 B.C.                                     | 31.6339440          | 34.8678580           | 20                            | 5                       | 17.8260335                     | 14.5469808                        |

Superscript letters refer to researchers who provided the material: A, Mark Nesbitt; B, F.H.; C, S.R.; D, Reinder Neef; E, Joy McCorriston; and F, Elena Marinova. Data from Tell Shioikh Faouqani [Riehl S, Ferris JP, Willcox G (2007) Stable carbon isotope evidence of changing water stress on cereal crops in ancient agricultural societies in the Near East (5300–2000 BP), Poster Presentation, Annual Meeting of the Stable Isotope Mass Spectrometry User Group (SIMSUG), June 20–22, 2007, Newcastle, UK].