Supplement A: Primary Sources of Archaeobotanical Datasets and Radiocarbon Dates from Southwest Asia

We have assembled in this supplement the primary sources of archaeobotanical datasets retrieved from sites in Southwest Asia (Part 1) and the radiocarbon dates by which these sites have been assigned calendrical ages (Part 2). Part 3 presents the radiocarbon dates for early PPN sites that, to date, have not produced relevant published archaeobotanical assemblages.

Part 1: Sites with Published Archaeobotanical Datasets

For general overviews see Asouti and Fuller (2012), Charles (2007), Colledge and Conolly (2007), Colledge, Conolly, and Shennan (2004), Fuller et al. (2012), Garrard (1999), Willcox (1999, 2007) and Zohary, Hopf, and Weiss (2012). Sources for individual sites are indicated below, listed alphabetically by site name, followed by a short assessment of plant domestication status for all sites listed in Tables 3-4, and a list of bibliographic references.

1A. Archaeobotanical primary data sources

Abdul Hosein, Tepe	Iran	Hubbard 1990.
‘Abr, Tell	Syria	Willcox et al. 2009, Willcox et al. 2008.
Abu Hureyra, Tell	Syria	Colledge and Conolly 2010; Hillman 2000; Hillman et al. 1989; Hillman et al. 2001; de Moulins 1997, 2000.
‘Ain Ghazal	Jordan	Rollefson et al. 1985.
Ali Kosh	Iran	Helbaek 1969.
Aşıklı Höyük	Turkey	van Zeist and de Roller 1995.
Aswad, Tell	Syria	van Zeist and Bakker-Heeres 1985 [1982].
Ayios Epiktitos Vrysi	Cyprus	Kyllo 1982.
Azraq 31	Jordan	Colledge 2001.
Basta	Jordan	Neef 2004.
Beidha	Jordan	Colledge 2001, Helbaek 1966.
Bouqras	Syria	van Zeist and Waterbolk-van Rooijen 1985.
Cafer Höyük	Turkey	de Moulins 1997.
Can Hasan III	Turkey	Hillman 1972, 1978; Renfrew 1968.
Cape Andreas Kastros	Cyprus	van Zeist 1981.
Çatalhöyük East	Turkey	Fairbairn et al. 2002; Fairbairn, Near, and Martinoli 2005.
Çayönü	Turkey	van Zeist and de Roller 1991/2.
Chia Sabz	Iran	Riehl et al. 2012.
Chogha Golan	Iran	Riehl et al. 2012.
Demirköy	Turkey	Savard et al. 2006.
Dhali-Agridhi	Cyprus	Stewart 1974.
Dhuweila	Jordan	Colledge 2001.
Dja’de	Syria	Willcox 1996, Willcox et al. 2009, Willcox et al. 2008.
El Hemmeh	Jordan	White and Makarewicz 2012.
El-Kerkh, Tell	Syria	Tanno and Willcox 2006b, Tsuneki et al. 2006.
El Kowm I	Syria	van Zeist 1986.

El Kowm II	Syria	de Moulins 1997.
Erbaba	Turkey	van Zeist and Buitenhuis 1983.
Ganj Dareh Tepe	Iran	van Zeist et al. 1986 [1984].
Gilgal I	Israel	Kislev et al. 2006, Kislev et al. 2004, Weiss et al. 2006.
Göbekli Tepe	Turkey	Neef 2003.
Ghoraife, Tell	Syria	van Zeist and Bakker-Heeres 1985 [1982].
Hacılar	Turkey	Helbaek 1970.
Hallan Çemi Tepesi	Turkey	Rosenberg et al. 1998, Savard et al. 2006.
Halula	Syria	Willcox 1996, Willcox et al. 2009.
Hayonim Cave	Israel	Hopf and Bar-Yosef 1987.
Höyücek	Turkey	Martinoli and Nesbitt 2003.
‘Iraq ed-Dubb	Jordan	Colledge 2001.
Jarmo	Iraq	Helbaek 1960, 1966; Watson 1983.
Jerf al Ahmar	Syria	Willcox 1996; 2002; Willcox and Fornite 1999; Willcox et al. 2009, Willcox et al. 2008.
Jericho	Palestine	Hopf 1983.
Khirokitia	Cyprus	Hansen 1989, 1994; Miller 1984; Waines and Stanley Price 1977.
Kissonerga-Mylouthkia	Cyprus	Murray 2003; Peltenburg et al. 2001.
Körtik Tepe	Iran	Riehl et al. 2012.
Maghzaliyeh, Tell	Iraq	Willcox 2006.
M'lefaat	Iraq	Nesbitt 1998, Savard et al. 2006.
Mureybet, Tell	Syria	van Zeist 1970, van Zeist and Bakker-Heeres 1986a [1984a], Willcox 2008, Willcox and Fornite 1999.
Nahal Hemar	Israel	Bar-Yosef 1985, Kislev 1988.
Nemrik	Iraq	Charles 2007, Nesbitt 1992.
Nevalı Çori	Turkey	Pasternak 1998, Tanno and Willcox 2006a, Willcox et al. 2008.
Netiv Hagdud	Israel	Kislev 1997, Kislev et al. 2004, Melamed et al. 2008.
Ohalo II	Israel	Kislev et al. 1992; Weiss et al. 2004, 2005; Nadel et al. 2004
Shillourokambos	Cyprus	Willcox 2001.
Qaramel, Tell	Syria	Tanno and Willcox 2006a, Willcox et al. 2009, Willcox et al. 2008.
Qermez Dere	Iraq	Savard et al. 2006, Watkins et al. 1991.
Ramad, Tell	Syria	van Zeist and Bakker-Heeres 1985 [1982].
Ras Shamra, Tell	Syria	van Zeist and Bakker-Heeres 1986b [1984b].
Sabi Abyad II	Syria	van Zeist 1999, van Zeist and de Roller 2000.
Wadi Faynan 16	Jordan	Kennedy 2007.
Wadi Fidan A	Jordan	Colledge 2001.
Wadi Fidan C	Jordan	Colledge 2001.
Wadi Hammeh 27	Jordan	Colledge 2001.
Wadi Jilat 13	Jordan	Colledge 2001.
Wadi Jilat 7	Jordan	Colledge 2001.
Yarim Tepe I	Iraq	Bakhteyev and Yanushevich 1980.
Yiftahel	Israel	Garfinkel 1987, Garfinkel et al. 1988, Kislev 1985.
Zahrat adh-Dhra‘ 2	Jordan	Edwards et al. 2004, Meadows 2004.

1B. Determination of domestication status for cereals and pulses

In this section we provide summaries of, and short commentaries on, the evidence relating to the determination of the domestication status of cereals and pulses in Southwest Asia. Full domesticated status was assigned in those cases where non-shattering rachis remains represent the majority of the assemblage (>50%), or at later sites where they are reported to occur alongside significantly enlarged grains. Partial domestication syndrome ("semi-domesticated" status) was assigned in those cases where non-shattering rachises are present but in a minority, or when grains show on average enlargement compared to those retrieved from earlier sites. We also comment on the evidence for the presence of arable weed floras.

Southern Levant (Israel, Jordan, Palestine)

(Note: a detailed overview and discussion of the south Levantine PPN botanical assemblages appears in Asouti and Fuller 2012, on which the site-based commentaries included below have been based)

Ohalo II

Despite a small proportion of tough (mainly basal) barley rachises reported by Kislev, Nadel, and Carmi (1992) grains are all considered to represent wild-type barley (Weiss et al. 2004, 2005). The occurrence of a small proportion of tough rachis mutants is characteristic of wild populations.

Wadi Hammeh 27

This site produced two poorly preserved and indeterminate barley rachis remains (Colledge 2001: Table 4.5). The grains are characteristic of wild-type barley.

Wadi Faynan 16

Thus far only a single wild-type barley grain and one wild-type barley rachis have been reported (Kennedy 2007).

Iraq ed-Dubb

This site did not produce domesticated-type barley rachises; thus barley is considered to be of wild status (Colledge 2001, Fuller 2007). Colledge (2001) reports a single einkorn-like wheat grain of the wild-type size range. Colledge (2001) has classified this grain as cultivated based on its occurrence outside the natural distribution for einkorn/rye. The presence of einkorn at Iraq ed-Dubb has been questioned by Willcox (2007) and its status as domesticated has been rejected by Nesbitt (2002). *Triticum* spikelet forks were not determined to species level, which leaves open the possibility that the taxon represented is emmer rather than einkorn. Colledge (2001) has also inferred the presence of an arable weed flora. Therefore, while pre-domestication cereal cultivation at this Iraq-ed Dubb is possible, it remains very uncertain whether einkorn was cultivated.

Gilgal I
This site is considered to have evidence for pre-domestication cultivation due to the finds of large stores of wild oats and barley (Weiss et al. 2006). The absence of basal collars from the barley ear has indicated that harvesting might have been done by collecting disarticulated spikelets from the ground rather than with sickles (Kislev et al. 2004).

Netiv Hagdud
Barley is predominantly of the wild type with regard to both rachis morphology and grain size. The absence of basal collars from the barley ear suggests the collection of disarticulated spikelets from the ground (Kislev et al. 2004). Other plausible pre-domesticated cultivars include rambling vetch (*Vicia peregrine*) the abundant finds of which are thought to reflect cultivation and storage (Melamed et al. 2008) and lentil that was also found in large concentrations. The presence of an arable weed flora has been inferred from other wild taxa found at this site.

Zahrat adh-Dhra‘ (ZAD) 2
Barley rachis remains are predominantly of the wild type; a small proportion of non-shattering forms are present, although it is higher than what would be expected in populations growing in the wild: 8% if all indeterminate rachises are regarded as wild-type but up to 29% when only identified rachises are counted. This indicates that some selection under cultivation was likely underway. Grain size is similar to the measurements obtained from Jerf el Ahmar (early levels) and Tell Qaramel (see below). Together these observations suggest the cultivation of wild-type barley. Other wild taxa include a number of possible members of an arable weed flora. Wheat remains were not positively identified to species (Edwards et al. 2004) but are likely to represent gathered wild-type emmer.

el-Hemmeh
This site produced a diverse assemblage with a dominance of wild-type cultivated barley and lentil, and trace amounts of morphologically wild emmer. Although barley rachis remains were of 94%-95% wild type, and are suggested to have been harvested in the dough (i.e. as green ears) barley grain size indicates an increase compared to expected wild size range, with about 40% of grain measurements falling in the expected domesticated size range (White and Makarewicz 2012). The site also produced large quantities of a diverse arable weed flora comparable to that of Netiv Hagdud and the range of taxa listed by Willcox (2012).

Jericho I, II (PPNA, PPNB)
For Jericho, which was not sampled by means of flotation, we rely on hand-collected grains and mud-brick plant impressions. Thus a quantitative assessment is difficult. From its PPNA phase (equivalent to the late PPNA-early PPNB chronological horizon according to the calibrated radiocarbon dates; see Part 2 of this supplement) few specimens were retrieved: 3 grains were attributed to einkorn, 34 to emmer and 32 to barley. Hopf (1983) reports a mixture of larger (domestic-type) and thinner (wild-type) barley and emmer grains. It is impossible to verify whether the published drawings portray the spikelets of domesticated-type cereals or cereals that were harvested green and used as temper before they were fully disarticulated. Lentil and possibly chickpea fragments are also present. These taxa appear in higher frequencies, and with more convincing evidence for the presence of domesticated crop types, in the PPNB phase (equivalent to the MPPNB horizon). Chickpea is one potential cultivar, as it is found outside its natural distribution. In addition, lentils show a shift to larger average diameters by comparison to earlier wild types, particularly during the later part of the

PPNB phase. We thus consider Jericho's PPNA material as representative of pre-domestication cultivation with partially developed domestication syndrome, while materials from the PPNB phase are suggestive of the transition to the cultivation of fully domesticated crops.

Tell Aswad I

EPPNB Aswad has produced a large assemblage of barley rachises predominantly of the shattering wild type, albeit with a sizeable minority of domesticated-type chaff. By its later phases, barley grains show a significant increase in size compared to the wild-type measured regional assemblages. Grain morphology indicates that emmer rather than einkorn makes up the majority of the *Triticum* assemblage, but wild- and domesticated-type spikelet bases have not been positively identified and quantified. Grain metrics suggest that the emmer recovered from Aswad differs from earlier presumed wild/semi-domesticated populations such as those known from Dja'de and early Çayönü. For this reason we have assigned to the Aswad cereals the status of pre-domesticated (wild-type) cultivars. As regards pulses, lentils appear to be enlarged and are thus considered to be of the domesticated type. This site has also produced an arable weed flora, including about half of the diagnostic taxa identified from Dja'de and Jerf el Ahmar (Willcox et al. 2008).

Beidha

The presence of naked barley implies that some barley is certainly domesticated, which is also suggested by increased grain size (Nesbitt 2002). However, Helbaek (1966) has proposed that cultivation focused on wild-type barley. On the whole, the evidence points to the exploitation of a semi-domesticated crop type. Emmer is attributed to a mixture of wild and domesticated forms (Feldman and Kislev 2007) identified mainly on the basis of grain metrics. For this reason we have assigned semi-domesticated status to emmer as well. Colledge (2001) has identified one 2-grained einkorn grain that falls within the domesticated-type size range. Lentils demonstrate a shift to larger average diameters compared to earlier wild types, while chickpea is found at this site outside its natural distribution.

Yiftahel

Lentils show a shift towards larger average diameters compared to earlier wild types, plus they were recovered in large quantities thus suggesting the presence of a domesticated crop type (Weiss et al. 2006).

Wadi Jilat 7

Barley rachises are predominantly of the wild type. Wheat remains include both wild- and domesticated-type einkorn grains, alongside some domesticated-type spikelet forks that have not been assigned to a particular species. Domesticated-type emmer grains are reported too, alongside arable weeds. The Jilat 7 botanical assemblage is thus re-classed as representative of the partial development of the domestication syndrome.

'Ain Ghazal

This site has produced an assemblage of well-documented domesticated-type wheat and barley rachis remains. There are also derived domesticates that could have developed and reproduced only under full human control, such as free-threshing wheats and naked barley, which are better attested in its later levels. A number of plausible arable weeds have been reported as well (*Galium*, *Silene*, Trifolieae).

Nahal Hemar
Emmer is regarded as a mixture of wild and domesticated types (Feldman and Kislev 2007). Barley has been accepted to be of the domesticated type on the basis of its rachis morphology (Nesbitt 2002). A few possible arable weeds, including *Fumaria* and *Glaucium*, have also been found.

Ghoraife
This site produced an assemblage of well-documented domesticates, inferred from the presence of domesticated-type wheat and barley rachises. There are also derived domesticates such as free-threshing wheats and naked barley. However, the arable weed flora is relatively poor.

Basta
Rachis and grain remains of both barley and emmer are reported to be of the domesticated type, with no definite wild types being present. Free-threshing wheat is also reported, albeit from later layers. Measurements are only available for 3 lentils; these suggest a domesticated-type diameter range of 3.1-3.3mm. Measurements for peas are also indicating the presence of a domesticated type.

Azraq 31
Although sample size is very small, all 3 barley rachises reported from Azraq 31 are of the domesticated type. Free-threshing wheat is present as well, thus indicating the domesticated status of wheat too.

Tell Ramad
Ramad has a small majority of domesticated-type barley rachis remains. Grain size shows a clear increase that falls within the domesticated-type size range for einkorn, barley, lentil and, by its later levels, emmer as well. Derived domesticates are also present, including free-threshing wheats and naked barley. van Zeist and Bakker-Heeres (1985:190) note that some 2-grained einkorn might be present but these grains were counted together with emmer.

Wadi Fidan A
Of the well-preserved rachises, domesticated-type barley clearly outnumbers wild-type barley, so we have assigned to barley fully domesticated status. Wheat is assigned domesticated status on the basis of numerous domesticated-type spikelet forks and grain size. Arable weed taxa have also been reported.

Wadi Jilat 13
Barley rachises are predominantly of the wild type. Domesticated-type spikelet bases of a glume wheat are reported, yet grains indicate a mixture of wild and domestic size ranges for both 1-grained and 2-grained einkorn. Emmer grains appear to fall within the domesticated-type size range. Overall the material maintains a much stronger signal of the domestication syndrome compared to the earlier assemblage from Jilat 7.

Northern Syria and Middle Euphrates

Abu Hureyra 1

It has been argued that the Epipalaeolithic occupation at Abu Hureyra witnessed the earliest occurrence of plant cultivation, manifested with the emergence of an arable weed flora linked to evidence for a small number of enlarged, potentially of the domesticated-type, rye grains (Hillman 2000, Hillman et al. 2001). There is, however, no evidence from rachis remains on shattering pattern, and enlarged grains are found in a minority, thus suggesting at most only partial development of the domestication syndrome. The absence of such traits for other cereals such as wheat and barley also indicates that any cereal cultivation activities at Abu Hureyra I were isolated, possibly one-off events, i.e. non contiguous with later trajectories towards cultivation and domestication. Colledge and Conolly (2010) have re-assessed the botanical evidence from Abu Hureyra noting that wild-type cereals contributed <15% of dry-land taxa in its Epipalaeolithic phases, with potential food taxa such as small-seeded grasses, pulses, chenopods, feather grasses, *Polygonum* and *Scirpus* being more abundant in the phases corresponding to the Younger Dryas. They have proposed that this indicates the diversification of wild plant gathering during the Late Natufian occupation of Abu Hureyra.

Tell Qaramel

Qaramel has as very small proportion of indeterminate but possibly domesticated-type einkorn spikelet bases (Tanno and Willcox 2006a); seed size is uniformly of the small, wild-type size range. This evidence suggests potential pre-domestication cultivation without the development of domestication syndrome traits.

Mureybet I-III

Although Mureybet is thought to possess evidence of an arable weed flora (e.g., Colledge 1998, Willcox et al. 2008) crop remains including lentil, pea, barley and einkorn are uniformly of the small, wild-type size range, while non-shattering chaff remains are also lacking. This suggests pre-domestication cultivation without the development of domestication syndrome traits.

Tell ‘Abr 3

This site has a taxonomically poor assemblage that is devoid of rachis remains, but with finds of einkorn/rye and barley grains that are consistent with wild types. Few potential representatives of an arable weed flora have been recovered.

Jerf el Ahmar

Jerf el Ahmar has <1% non-shattering barley rachis (Willcox et al. 2008), and grains that are generally on the lower end of the small wild-type size range. However, a shift has been observed to slightly enlarged barley and einkorn/rye grains within the later levels of the site, which can be considered as the beginning of selection pressures for the development of this trait of the domestication syndrome (Fuller 2007, Willcox 2004). A well-documented arable weed flora is also reported (Willcox et al. 2008).

Dja’de

This site has ~1% of non-shattering barley rachises (Willcox et al. 2008). In addition, there are finds of barley and einkorn/rye grains that are larger than those found in the earliest levels of Jerf el Ahmar, in Tell Qaramel and in Mureybet, which can be considered as indicative of the beginning of selection pressures for this trait of the domestication syndrome (Fuller 2007, Willcox 2004). This site produced a well-documented arable weed flora (Willcox et al. 2008).

Mureybet IV
This phase is generally poor in archaeobotanical materials, but is nonetheless reported to lack any evidence for domesticated crops (Willcox 2008).

Tell Halula
The assemblage is dominated by free-threshing wheats and domesticated-type emmer (Willcox et al. 2009: Table 1). Domesticated-type barley is present too. However, at least a small amount of wild-type einkorn and barley has been retrieved, while it is likely that some wild-type emmer is present as well (cf. Willcox 1996). The arable weed flora includes about half of the diagnostic taxa identified from Djade and Jerf el Ahmar (Willcox et al. 2008).

Abu Hureyra 2A-C
The later levels of Abu Hureyra produced evidence for enlarged cereal grains, einkorn spikelet forks that were entirely of the domesticated type or indeterminate, plus domesticated-type rachis remains of rye that possibly represent the earliest forms of domesticated rye in Southwest Asia (see also entry for Can Hasan III, below). In addition, there were derived domesticates such as free-threshing wheats (both tetraploid and hexaploid) and naked barley (Colledge and Conolly 2007, de Moulins 2000). The site has also produced an arable weed flora, including most of the diagnostic taxa identified from Dja'de and Jerf el Ahmar (Willcox et al. 2008).

Sabi Abyad II
Sabi Abyad II produced a large assemblage of well-documented domesticated-type wheat and barley rachises, in addition to derived domesticates such as free-threshing wheats and naked barley, plus quantities of domesticated 2-grained einkorn (van Zeist 1999).

Tell Bouqras
This site has produced a large assemblage of well-documented domesticated-type wheat and barley rachises, in addition to derived domesticates such as free-threshing wheats and naked barley.

El Kowm II
El Kowm II has produced a large assemblage of well-documented domesticated-type wheat and barley rachises, in addition to derived domesticates such as free-threshing wheats and naked barley.

Southeast and Central Anatolia (Turkey)

Göbekli Tepe

Göbekli has produced thus far only very small quantities of cereal grains. Their status is believed to be wild and/or uncertain (Neef 2003, Willcox 2007, Willcox et al. 2008).

Çayönü (RP, GP, Ch.H)

Einkorn grains show a marked size increase compared to earlier measured regional populations. With emmer grains the situation is less clear, as average grain size is only marginally larger than that reported for Dja'de. van Zeist and de Roller (1991/2) did differentiate some larger, domesticated-type grains from smaller, wild-type ones. Wheat spikelet bases were not differentiated and quantified, but it seems certain that domesticated-type einkorn and emmer were at least present (van Zeist and de Roller 1991/2: Figure 8). Domesticated-type emmer bases are reported as being dominant in several secondary sources (e.g., Colledge and Conolly 2007, Nesbitt 2004, Willcox 2007). However, it is not clear whether these finds represent the majority of chaff remains, and in any case they have not been re-examined and quantified with the more precise criteria established by Tanno and Willcox (2006a). Barley, of which rachis fragments were present, has been provisionally identified as wild-type. The evidence from Çayönü can therefore be regarded as indicating the beginning (if not the establishment) of the evolution of the domestication syndrome in cereals in southeast Anatolia. The Çayönü peas also appear to be larger on average compared to those of Mureybet and the size ranges that are expected for wild taxa. Çayönü has also produced an arable weed flora, including about half of the diagnostic taxa identified from Dja'de and Jerf el Ahmar (Willcox et al. 2008).

Nevalı Çori

Non-shattering domesticated-type spikelet bases of 1-grained einkorn are present at Nevalı Çori, forming a sizeable minority (~25%) of the assemblage. In the original preliminary report Pasternak (1998:170) claimed that "nearly all" forks were of the domesticated type. However, the greatly reduced count reported after their re-examination by Tanno and Willcox (2006a; *contra* Haldorsen et al. 2011) serves as a cautionary tale against over-interpreting older reports that are not supported by quantified evidence. Furthermore, the published illustrations (Pasternak 1998: Figure 3) indicate that many spikelet forks had been damaged, possibly by crop-processing (dehusking) and were thus classified as indeterminate. Domesticated status for wheat rachises was also not accepted by Nesbitt (2002). 2-grained einkorn is reported to make up about 20% of the einkorn grain assemblage (cf. Kreuz and Boenke 2002:237). Barley rachises appear to be of the wild type, while wild-type barley and emmer grains are also reported, despite the lack of measurements. Lentils are noticeably small and fall within the wild-type size range, although peas are reported to be of the domesticated type.

Cafer Höyük XIII-VIII

50-60% of einkorn rachises are of the domesticated type, while domesticated-type emmer rachises are also prominent, and they become even more so in later levels. The presence of naked wheat further testifies to the domesticated status of wheats. The absence of barley rachises and grain measurements means that the status of barley at this site remains unclear. Arable weeds are present including *Galium* and *Heliotropium*.

Hacılar
The presence of naked barley confirms the domesticated status of barley.

Aşıklı Höyük
Although einkorn and emmer chaff was not differentiated and quantified in detail, it is reported to include domesticated types (Colledge and Conolly 2007, van Zeist and de Roller 1995). Wild types are also present (cf. Nesbitt 2002). The identification of naked wheat constitutes definitive proof that domesticated-type wheats are present at Aşıklı. Some wild-type barley was also recovered. Still, the presence of naked barley at Aşıklı, amongst the earliest anywhere (see entries for Beidha, above and Hacılar, below) confirms that barley too was predominantly of the domesticated type. Finally, lentil measurements are large enough for lentils to be included in the suite of domesticated crops.

Can Hasan III
This site is reported to have domesticated-type wheat and barley chaff as well as rye (Hillman 1978). Botanical finds also include free-threshing wheats (hexaploid and tetraploid) and naked six-row barley. Peas are of large size, indicating their domesticated status (Renfrew 1968).

Çatalhöyük East
Neolithic Çatalhöyük contains a large assemblage of well-documented domesticated-type wheat and barley rachises, alongside derived domesticates such as free-threshing wheats (both tetraploid and hexaploid), naked barley and six-row barley. Chickpea was likely domesticated on the grounds of being found outside its natural distribution.

Eastern Fertile Crescent (eastern Turkey, Iran, Iraq)

Qermez Dere

Various wild taxa were found, including some wild-type barley and einkorn/rye grains, plus large quantities of lentils that are assumed to be of the wild type (Savard et al. 2006).

Körtik Tepe

Körtik Tepe has a diverse assemblage dominated by wild grasses, Brassicaceae species, small-seeded legumes and sea club rush, *Scirpus maritimus* (probably *Bolboschoenus glaucus,* following revised taxonomy, as proposed in Wollstonecroft et al. 2011), as well as some Polygonaceae. Both wheat and barley type grains are present as well as a few rye/two-grain einkorn grains. There appear to be no domesticates, but several of the wild taxa are on the list of proposed pre-domestication cultivation weeds (following Willcox 2012).

Demirköy

Various wild taxa were found, including some wild-type barley grains (Savard et al. 2006).

Hallan Çemi

Various wild taxa were found, including low quantities of wild-type barley grains (Savard, Nesbitt, and Jones 2006).

Nemrik 9

Nemrik 9 has produced one sample that included the remains of wild-type pea and lentil, but was completely devoid of cereals (Charles 2007).

M'lefaat

A range of species have been found including some wild-type barley, einkorn and lentils (Savard et al. 2006).

Chogha Golan

This site produced an assemblage numbering a few thousands seeds from a sequence dated between ca. 8700 BC and 7700 BC that includes large and small-seeded taxa of both pulses and grasses, with grasses being more abundant (Riehl et al. 2012). Wild barley rachises and grains occurred through the sampled sequence but were found with higher frequencies in the latest levels of the site. By comparison very few wheat grains were found although they were also proportionally more abundant (amounting to 7 grains) in the latest levels. Only 1 domesticated-type barley rachis was reported from the latest phase of the site compared to 29 wild-type rachises.

Chia Sabz

Both trenches produced several hundreds of seeds, mostly of wild taxa, especially small-seeded legumes, *Vicia/Lathyrus* and various grasses including *Aegilops*. Wild barley and lentils are also recurrent while a few glume wheat pieces of indeterminate status were also found (Riehl et al. 2012).

Tepe Abdul Hosein
Despite the limited sample size, botanical finds included some chaff impressions as well as charred grains, which are accepted as domesticated-type (Charles 2007).

Ganj Dareh
Ganj Dareh gave evidence of domesticated-type barley rachises; wild types were also present (cf. Charles 2007, Nesbitt 2002). Grain size measurements indicate significantly enlarged grains. By contrast, measurements for lentils and peas place them within the wild-type size range (cf. Charles 2007).

Jarmo
Helbaek (1959, 1966) has reported the presence of wild-type barley, emmer and einkorn, alongside domesticated-type barley and emmer. We consider this as a likely indication for the partial development of the domestication syndrome at Jarmo.

Chogha Bonut
Both cereals and lentils from this site are generally regarded to be of the domesticated type.

Ali Kosh (Bus Mordeh phase)
The earlier Bus Mordeh phase contained the remains of wild- and domesticated-type barley, with domesticated types (indicated by both grain size and rachises) predominating. The status of barley as domesticated is further confirmed by the occurrence of naked barley. Domesticated- and wild-type einkorn is also reported, including rachis remains (cf. Nesbitt 2002) while the presence of domesticated-type emmer has been inferred on the basis of grain size. Large, domesticated-type lentils are also reported from the later part of the Bus Mordeh phase.

Tell Maghzaliyeh
Maghzaliyeh is characterized by very low botanical sample size. Both cereals and lentils from the site are generally regarded to be of the domesticated type.

Umm Dabaghiyah
Only occasional finds of domesticated-type emmer and barley have been reported (Charles 2007).

Yarim Tepe I
Grain crops are regarded to be of the domesticated type on the basis of their large size.

Western Syria and Cyprus

Kissonerga-Mylouthkia
This site has provided the richest archaeobotanical assemblage of the Cypriot PPN, including an arable weed flora. A limited amount of chaff remains has indicated the presence of domesticated-type emmer, einkorn and barley, while grain measurements are also suggestive of domesticated-type size ranges.

Tell el-Kerkh
The majority of einkorn spikelet bases appear to be of the domesticated type. Kerkh has also produced what may be the earliest evidence for domesticated-type chickpeas and broad beans.

Shillourokambos (Parekklisha-Shillourokambos)
The archaeobotanical assemblage is fairly small, but indicates nevertheless that wild-type barley outnumbers domesticated-type barley as regards both grain and rachises. Emmer is present, but its status as domesticated remains unclear. Also present is a 2-grained einkorn type, possibly of wild status.

Ras Shamra
Barley and lentils fall within the domesticated-type size range, while domesticated-type wheat and barley chaff is also present. Free threshing wheat is present too, in very small quantities.

Cape Andreas-Kastros
Cereals and pulses are certainly of the domesticated type based on grain size criteria. A limited amount of glume wheat chaff seems to be of the domesticated type too, although it has not been re-examined with the more recently established criteria. Lentils and peas are identified as domesticated-type on the basis of their enlarged size.

Khirokitia
The domesticated status of the crops is supported by the presence of emmer, einkorn and barley domesticated-type chaff, as well as the large size of lentils and peas. Hexaploid free-threshing wheat is also reported.

References cited

Asouti, E., and D. Q Fuller. 2012. From foraging to farming in the southern Levant: the development of Epipalaeolithic and Pre-Pottery Neolithic plant management strategies. *Vegetation History and Archaeobotany* 21:149–162.

Bakhteyev, F. K., and Z. V. Yanushevich. 1980. Discoveries of cultivated plants in the early farming settlements of Yarim-Tepe I and Yarim-Tepe II in northern Iraq. *Journal of Archaeological Science* 7:167–178.

Bar-Yosef, O. 1985. *A cave in the desert: Nahal Hemar*. Jerusalem: Israel Museum.

Charles, M. 2007. East of Eden? A consideration of Neolithic crop spectra in the eastern Fertile Crescent and beyond. In *The origins and spread of domestic plants in Southwest Asia and Europe*. S. Colledge and J. Conolly, eds. Pp. 37–52. Walnut Creek, CA: Left Coast Press.

Colledge, S. 1998. Identifying pre-domestication cultivation using multivariate analysis. In *The origins of agriculture and crop domestication*. A. B. Damania, J. Valkoun, G. Willcox, and C. O. Qualset, eds. Pp. 121–131. Aleppo: ICARDA.

———. 2001. *Plant exploitation on Epipalaeolithic and early Neolithic sites in the Levant*. British Archaeological Reports, International Series 986. Oxford: Archaeopress.

Colledge, S., and J. Conolly. 2007. A review and synthesis of the evidence for the origins of farming on Cyprus and Crete. In *The origins and spread of domestic plants in Southwest Asia and Europe*. S. Colledge and J. Conolly, eds. Pp. 53–74. Walnut Creek, CA: Left Coast.

Colledge, S., and J. Conolly. 2010. Reassessing the evidence for the cultivation of wild crops during the Younger Dryas at Tell Abu Hureyra, Syria. *Environmental Archaeology* 15:124–138.

Colledge, S., J. Conolly, and S. Shennan. 2004. Archaeobotanical evidence for the spread of farming in the Eastern Mediterranean. *Current Anthropology* 45(suppl.):S35–S58.

Edwards, P. C., J. Meadows, G. Sayej, and M. Westaway. 2004. From the PPNA to the PPNB: new views from the southern Levant after excavations at Zahrat adh-Dhra‘ 2 in Jordan. *Paléorient* 30(2):21–60.

Fairbairn, A., E. Asouti, J. Near, and D. Martinoli. 2002. Macro-botanical evidence for plant use at Neolithic Çatalhöyük, south-central Anatolia, Turkey. *Vegetation History and Archaeobotany* 11:41–54.

Fairbairn, A., J. Near, and D. Martinoli. 2005. Macrobotanical investigation of the North, South and KOPAL area excavations at Çatalhöyük East. In *Inhabiting Çatalhöyük: reports from the 1995-1999 seasons*. I. Hodder, ed. Pp. 137–202. Çatalhöyük Research Project 4. Cambridge: British Institute of Archaeology at Ankara & McDonald Institute for Archaeological Research.

Feldman, M., and M. E. Kislev. 2007. Domestication of emmer wheat and evolution of free-threshing tetraploid wheat. *Israel Journal of Plant Sciences* 55:207–221.

Fuller, D. Q. 2007. Contrasting patterns in crop domestication and domestication rates: recent insights from Old World archaeobotany. *Annals of Botany* 100:903–924.

Fuller, D. Q, G. Willcox, and R. Allaby. 2012. Early agricultural pathways: moving outside the ‘core area’ hypothesis in Southwest Asia. *Journal of Experimental Botany* 63(2):617–633.

Garfinkel, Y. 1987. Yiftahel: A Neolithic village from the seventh millennium BC in Lower Galilee, Israel. *Journal of Field Archaeology* 14:199–212.

Garfinkel, Y., M. E. Kislev, and D. Zohary. 1988. Lentil in the Pre-Pottery Neolithic B Yiftahel: additional evidence of its early domestication. *Israel Journal of Botany* 37:49–51.

Garrard, A. 1999. Charting the emergence of cereal and pulse domestication in South-West Asia. *Environmental Archaeology* 4:67–86.

Haldorsen, S., H. Akan, B. Çelik, and M. Heun. 2011. The climate of the Younger Dryas as a boundary for einkorn domestication. *Vegetation History and Archaeobotany* 20:305–318.

Hansen, J. 1989. Khirokitia plant remains: preliminary report (1980-1981, 1983). In *Fouilles récentes à Khirokitia (Chypre) 1983-1986*. A. Le Brun, ed. Pp. 235–250. Paris: ADPF.

———. 1994. Khirokitia plant remains: preliminary report (1986, 1988-1990). In *Fouilles récentes à Khirokitia (Chypre) 1988-1991*. A. Le Brun, ed. Pp. 393–409. Paris: ADPF.

Helbaek, H. 1959. Domestication of food plants in the Old World. *Science* 130:365–372.

———. 1960. The palaeoethnobotany of the Near East and Europe. In *Prehistoric investigations in Iraqi Kurdistan*. R. J. Braidwood and B. Howe, eds. Pp. 99–118. Chicago: University of Chicago Press.

———. 1966. Commentary on the phylogenesis of *Triticum* and *Hordeum*. *Economic Botany* 20:350–360.

———. 1969. Plant collecting, dry-farming and irrigation agriculture in prehistoric Deh Luran. In *Prehistory and human ecology of the Deh Luran Plain*. F. Hole, K. V. Flannery, and J. A. Neely, eds. Pp. 383–426. Ann Arbor, MI: Museum of Anthropology, University of Michigan.

———. 1970. The plant husbandry of Hacılar. In *Excavations at Hacılar*. J. Mellaart, ed. Pp. 189–244. Edinburgh: Edinburgh University Press.

Hillman, G. C. 1972. The plant remains. [In French, D. H. Excavations at Can Hasan III 1969-1970, pp. 181-190]. In *Papers in economic prehistory*. E. S. Higgs, ed. Pp. 180–190. Cambridge: Cambridge University Press.

———. 1978. On the origins of domestic rye-*Secale cereale*. The finds from aceramic Can Hasan III in Turkey. *Anatolian Studies* 28:157–174.

———. 2000. Abu Hureyra 1: The Epipalaeolithic. In *Village on the Euphrates. From foraging to farming at Abu Hureyra*. A. M. T. Moore, G. C. Hillman, and A. J. Legge, eds. Pp. 327–398. New York: Oxford University Press.

Hillman, G. C., S. M. Colledge, and D. R. Harris. 1989. Plant food economy during the Epipalaeolithic period at Tell Abu Hureyra, Syria. In *Foraging and farming: Evolution of plant exploitation.* D. R. Harris, and G. C. Hillman, eds. Pp. 240-268. London: Unwin and Hyman.

Hillman, G. C., R. Hedges, A. M. T. Moore, S. Colledge, and P. Pettitt. 2001. New evidence of Late Glacial cereal cultivation at Abu Hureyra on the Euphrates. *Holocene* 11:383–393.

Hopf, M. 1983. Appendix B: Jericho plant remains. In *Excavations at Jericho, vol. 5. The pottery phases of the tell and other finds*. K. M. Kenyon, and T. A. Holland, eds. Pp. 576–621. London: British School of Archaeology in Jerusalem.

Hopf, M., and O. Bar-Yosef. 1987. Plant remains from Hayonim Cave. *Paléorient* 13:117–120.

Hubbard, R. N. L. B. 1990. Archaeobotany of Abdul Hosein. The carbonized seeds from Tepe Abdul Hosein: results of preliminary analyses. In *Tepe Abdul Hosein. A Neolithic site in western Iran. Excavations 1978*. J. Pullar, ed. Pp. 217–221. British Archaeological Reports, International Series 563. Oxford: Archaeopress.

Kennedy, A. 2007. The plant macrofossils. In *The early prehistory of Wadi Faynan, southern Jordan*. B. Finlayson, and S. Mithen, eds. Pp. 420–428. Levant Supplementary Series 4. Oxford: Oxbow.

Kislev, M. E. 1985. Early Neolithic horsebean from Yiftahel, Israel. *Science* 228:319–320.

———. 1988. Nahal Hemar cave, desiccated plant remains: an interim report. *'Atiqot* 18:76–81.

———. 1997. Early agriculture and palaeoecology of Netiv Hagdud. In *An early Neolithic village in the Jordan valley*. O. Bar-Yosef and A. Gopher, eds. Pp. 209–236. Cambridge, MA: Peabody Museum of Archaeology and Ethnology, Harvard University.

Kislev, M. E., D. Nadel, and I. Carmi. 1992. Epipalaeolithic (19,000 bp) cereal and fruit diet at Ohalo II, Sea of Galilee, Israel. *Review of Palaeobotany and Palynology* 73:161–166.

Kislev, M. E., E. Weiss, and A. Hartmann. 2004. Impetus for sowing and the beginning of agriculture: ground collecting of wild cereals. *Proceedings of the National Academy of Sciences* 101:2692–2695.

Kislev, M. E., A. Hartmann, and O. Bar-Yosef. 2006. Early domesticated fig in the Jordan Valley. *Science* 312:1372–1374.

Kreuz, A., and N. Boenke. 2002. The presence of two-grained einkorn at the time of the Bandkeramik culture. *Vegetation History and Archaeobotany* 11:233–240.

Kyllo, M. 1982. The botanical remains: identifications and discussion. In *Vrysi: A subterranean settlement in Cyprus*. E. Peltenburg, ed. Pp. 415–436. Warmintster: Aris & Phillips.

Martinoli, D., and M. Nesbitt. 2003. Plant stores at Neolithic Höyücek, southwest Turkey. *Anatolian Studies* 53:17–32.

Meadows, J. 2004. The earliest farmers? Archaeobotanical research at Pre-Pottery Neolithic A sites in Jordan. In *Studies in the history and archaeology of Jordan VIII: archaeological and historical perspectives on society culture and identity.* F. al-Khraysheh, ed. Pp. 119–128. Amman: Department of Antiquities of Jordan.

Melamed, Y., U. Plitzmann, and M. E. Kislev. 2008. *Vicia peregrina:* an edible early Neolithic legume. *Vegetation History and Archaeobotany* 17(suppl.1):S29–S34.

Miller, N. F. 1984. Some plant remains from Khirokitia, Cyprus: 1977 and 1978 excavations. In *Fouilles récentes à Khirokitia (Chypre) 1977-1981, volume 1*. A. Le Brun, ed. Pp. 183–188. Paris: ADPF.

de Moulins, D. 1997. *Agricultural changes at Euphrates and steppe sites in the mid-8th to the 6th millennium BC.* British Archaeological Reports, International Series 683. Oxford: Archaeopress.

———. 2000. Abu Hureyra 2: Plant remains from the Neolithic. In *Village on the Euphrates. From foraging to farming at Abu Hureyra*. A. M. T. Moore, G. C. Hillman, and A. J. Legge, eds. Pp. 399-416. New York: Oxford University Press.

Murray, M. A. 2003. Archaeobotanical remains from the aceramic Neolithic wells (ca. 9000 BP). In *The colonisation and settlement of Cyprus: Investigations at Kissonerga-Mylouthkia 1977-1996. Lemba Archaeological Project, Cyprus. Vol. III.1*. E. Peltenburg, ed. Pp. 59–72. Sävedalen: Paul Åströms Förlag.

Nadel, D., E. Weiss, O. Simchoni, A. Tsatskin, A. Danin, and M. E. Kislev. 2004. Stone Age hut in Israel yields world's oldest evidence of bedding. *Proceedings of the National Academy of Sciences* 101:6821–6826.

Neef, R. 2003. Overlooking the steppe forest: preliminary report on the botanical remains from early Neolithic Göbekli Tepe (southern Turkey). *Neo-Lithics* 2/03:13–15.

———. 2004. Vegetation and plant husbandry. In *Basta 1. The human ecology*. H. J. Nissen, M. Muheisen, and H. G. K Gebel, eds. Pp. 55–71. Berlin: ex oriente.

Nesbitt, M. 1992. VIII. A preliminary note on the charred plant remains. In *Nemrik 9. Pre-pottery Neolithic site in Iraq. Volume 2: House No 1/ 1A/ 1B.* S. K. Kozlowski, ed. P. 127. Warsaw: University of Warsaw.

———. 1998. Preliminary report on the plant remains from M'lefaat. *Cahiers de l' Euphrate* 8:232–233, 272.

———. 2002. When and where did domesticated cereals first occur in southwest Asia? In *The dawn of farming in the Near East*. R. Cappers and S. Bottema, eds. Pp. 113-132. Berlin: ex oriente.

———. 2004. Can we identify a centre, a region or a supra-region for Near Eastern plant domestication? *Neo-Lithics* 1/04:38–40.

Pasternak, R. 1998. Investigation of botanical remains from Nevalı Çori, PPNB, Turkey: a short interim report. In *The origins of agriculture and crop domestication.* A. B. Damania, J. Valkoun, G. Willcox, and C. O. Qualset, eds. Pp. 170–177. Aleppo: International Center for Agricultural Research in Dry Areas.

Peltenburg, E., S. Colledge, P. Croft, A. Jackson, C. McCartney, and M. A. Murray. 2001. Neolithic dispersals from the Levantine corridor: a Mediterranean perspective. *Levant* 33:35–64.

Renfrew, J. 1968. A note on the Neolithic grain from Can Hasan. *Anatolian Studies* 18:55–56.

Riehl, S., M. Benz, N. J. Conard, H. Darabi, K. Deckers, H. F. Nashli, and M. Zeidi-Kulehparchec. 2012. Plant use in three Pre-Pottery Neolithic sites of the northern and eastern Fertile Crescent: a preliminary report. *Vegetation History and Archaeobotany* 21:95–106.

Rollefson, G. O., A. H. Simmons, M. L. Donaldson, W. Gillespie, Z. Kafafi, I.-U. Köhler-Rollefson, E. McAdam, S. L. Rolston, and M. K. Tubb. 1985. Excavation of the Pre-Pottery Neolithic B village of ʻAin Ghazal (Jordan) 1983. *Mitteilungen der Deutschen Orientgesellschaft zu Berlin* 117:69–116.

Rosenberg, M., M. Nesbitt, R. W. Redding, and B. L. Peasnall. 1998. Hallan Çemi, pig husbandry, and post-Pleistocene adaptations along the Taurus-Zagros arc (Turkey). *Paléorient* 24:25–41.

Savard, M., M. Nesbitt, and M. K. Jones. 2006. The role of wild grasses in subsistence and sedentism: new evidence from the northern Fertile Crescent. *World Archaeology* 38:179–196.

Stewart, R. T. 1974. Paleobotanic investigation: 1972 season. In *American expedition to Idallion, Cyprus. First preliminary report: seasons 1971 and 1972*. L. E. Stager, A. Walker, and E. G. Wright, eds. Pp. 122–129. Cambridge, MA: American Schools of Oriental Research.

Tanno, K.-I., and G. Willcox. 2006a. How fast was wild wheat domesticated? *Science* 311:1886.

———. 2006b. The origins of cultivation of *Cicer arietinum* L. and *Vicia faba* L.: early finds from Tell el-Kerkh, north-west Syria, late 10th millennium B.P. *Vegetation History and Archaeobotany* 15:197–204.

Tsuneki, A., M. Arimura, O. Maeda, K.-I. Tanno, and T. Anezaki. 2006. The Early PPNB in the north Levant: a new perspective from Tell Ain El-Kerkh, northwest Syria. *Paléorient* 32:47–71.

Waines, J., and N. P. Stanley-Price. 1977. Plant remains from Khirokitia in Cyprus. *Paléorient* 3:281–284.

Watkins, T., A. Betts, K. Dobney, and M. Nesbitt. 1991. *Qermez Dere, Tel Afar: Interim Report No 2, 1989*. Edinburgh: University of Edinburgh, Department of Archaeology, Project Paper 13.

Watson, P. J. 1983. Note on the Jarmo plant remains. In *Prehistoric archaeology along the hilly flanks.* S. Braidwood, L. Braidwood, B. Howe, C. Reed and P. J. Watson, eds. Pp. 501-503. Chicago: Oriental Institute.

Weiss, E., M. E. Kislev, and A. Hartmann. 2006. Autonomous cultivation before domestication. *Science* 312:1608–1610.

Weiss, E., M. E. Kislev, O. Simchoni, and D. Nadel. 2005. Small-grained wild grasses as staple food at the 23 000-year-old site of Ohalo II, Israel. *Economic Botany* 58S:S125–S134.

Weiss, E., W. Wetterstrom, D. Nadel, and O. Bar-Yosef. 2004. The broad spectrum revisited: evidence from plant remains. *Proceedings of the National Academy of Sciences* 101:9551-9555.

White, C. E., and C. A. Makarewicz. 2012. Harvesting practices and early Neolithic barley cultivation at el-Hemmeh, Jordan. *Vegetation History and Archaeobotany* 21:85–94.

Willcox, G. 1996. Evidence for plant exploitation and vegetation history from three early Neolithic pre-pottery sites on the Euphrates (Syria). *Vegetation History and Archaeobotany* 5:143–152.

———. 1999. Agrarian change and the beginnings of cultivation in the Near East: evidence from wild progenitors, experimental cultivation and archaeobotanical data. In *The prehistory of food*. C. Gosden, and J. Hather, eds. Pp. 479–500. London: Routledge.

———. 2001. Présence des céréales dans le Néolithique précéramique de Shillourokambos à Chypre: résultats de la campagne 1999. *Paléorient* 26(1):129–135.

———. 2002. Charred plant remains from a 10th millennium B.P. kitchen at Jerf el Ahmar (Syria). *Vegetation History and Archaeobotany* 11:55–60.

———. 2004. Measuring grain size and identifying Near Eastern cereal domestication: evidence from the Euphrates valley. *Journal of Archaeological Science* 31:145–150.

———. 2006. Maghzaliyeh 1979. Report available online at: http://perso.wanadoo.fr/g.willcox/magzaliaseeds.htm (Accessed 1 March 2010)

———. 2007. The adoption of farming and the beginnings of the Neolithic in the Euphrates valley: cereal exploitation between the 12th and 8th millennia cal BC. In *The origins and spread of domestic plants in Southwest Asia and Europe.* S. Colledge and J. Conolly, eds. Pp. 21-36. Walnut Creek, CA: Left Coast Press.

———. 2008. Nouvelles données archéobotaniques de Mureybet et la néolithisation du moyen Euphrate. In *Le site néolithique de Tell Mureybet (Syrie du Nord), en hommage à Jacques Cauvin*. J. Ibañez, ed. Pp. 103–114. British Archaeological Reports, International Series 1843(1). Oxford: Archaeopress.

———. 2012. Searching for the origins of arable weeds in the Near East. *Vegetation History and Archaeobotany* 21:163–167.

Willcox, G., and S. Fornite. 1999. Impressions of wild cereal chaff in pisé from the tenth millennium at Jerf el Ahmar and Mureybet: northern Syria. *Vegetation History and Archaeobotany* 8:21–24.

Willcox, G., S. Fornite, and L. Herveux. 2008. Early Holocene cultivation before domestication in northern Syria. *Vegetation History and Archaeobotany* 17:313–325.

Willcox, G., R. Buxo, and L. Herveux. 2009. Late Pleistocene and Early Holocene climate and the beginnings of cultivation in northern Syria. *Holocene* 19:151–158.

Wollstonecroft, M. M., Z. Hroudová, G. C. Hillman, and D. Q Fuller. 2011. Bolboschoenus glaucus (Lam.) S.G. Smith, a new species in the flora of the ancient Near East. *Vegetation History and Archaeobotany* 20(5):459–470.

van Zeist, W. 1970. The Oriental Institute Excavations at Mureybet, Syria: preliminary report on the 1965 campaign Part III: The paleobotany. *Journal of Near Eastern Studies* 29(3):167–176.

———. 1981. Plant remains from Cape Andreas-Kastros (Cyprus). In *Un site néolithique précéramique en Chypre: Cap Andreas-Kastros*. A. Le Brun, ed. Pp. 95–99. Paris: ADPF.

van Zeist, W. 1999. Evidence for agricultural change in the Balikh basin, northern Syria. In *The Prehistory of Food. Appetites for Change*. C. Gosden, and J. Hather, eds. Pp. 350–373. London: Routledge.

———. 1986. Appendix: Plant remains from Neolithic El Kowm, central Syria. In *A Neolithic village at Tell El Kowm in the Syrian desert*. R. H. Dorneman, ed. Pp. 65–68. Chicago: Oriental Institute.

van Zeist, W., and J. H. Bakker-Heeres. 1985. Archaeobotanical studies in the Levant 1. Neolithic sites in the Damascus Basin: Aswad, Ghoraifé, Ramad. *Palaeohistoria* 24:165–256.

———. 1986a. Archaeobotanical studies in the Levant 3. Late Palaeolithic Mureybet. *Palaeohistoria* 26:171–199.

———. 1986b. Archaeobotanical Studies in the Levant, 2. Neolithic and Halaf levels at Ras Shamra. *Palaeohistoria* 26:151–170.

van Zeist, W., and H. Buitenhuis. 1983. A palaeobotanical study of Neolithic Erbaba, Turkey. *Anatolica* 10:47–89.

van Zeist, W. A., and G. J. de Roller. 1991/2. The plant husbandry of aceramic Çayönü, SE Turkey. *Palaeohistoria* 33/34:65–96.

van Zeist, W. A., and G. J. de Roller. 1995. Plant remains from Aşıklı Höyük, a pre-pottery Neolithic site in central Anatolia. *Vegetation History and Archaeobotany* 4:179–185.

van Zeist, W., and G. J. de Roller. 2000. The plant remains. In *Tell Sabi Abyad II: The Pre-pottery Neolithic B settlement*. M. Verhoeven, and P. M. M. G. Akkermans, eds. Pp. 137-147. Istanbul: Nederlands Historisch-Archaeologisch Instituut.

van Zeist, W., and W. Waterbolk-van Rooijen. 1985. The palaeobotany of Tell Bouqras, eastern Syria. *Paléorient* 11:131–147.

van Zeist, W., P. E. L. Smith, R. M. Palfenier, M. Suwijn, and W. A. Casparie. 1986. An archaeobotanical study of Ganj Dareh Tepe, Iran. *Palaeohistoria* 26:201–224.

Zohary, D., M. Hopf, and E. Weiss. 2012. *Domestication of Plants in the Old World.* 4th edition. Oxford: Oxford University Press.

Part 2: Calibrated Radiocarbon Dates for Sites with Published Archaeobotanical Datasets

Gathered in this supplement are the radiocarbon dates from which age estimates for major sites with published archaeobotanical assemblages have been derived. With regard to the dating of the botanical datasets point age estimates have been used, for example in plotting changing frequencies of non-shattering or grain size traits against time. We have opted for modal values when a strong mode is evident, or median values of the 1-sigma of the summed calibrated probability of the calendrical age. Calibrations and sums were performed with OxCal 3.10 software (Bronk Ramsey 2005) using the most recently revised calibration curve (IntCal09; Reimer et al. 2009). Sites are listed in the same order as they appear in Tables 3-4. For the majority of the sites raw radiocarbon dates were obtained from the Radiocarbon CONTEXT database (Böhner and Schyle 2002-2006) and from PPND – The Platform for Neolithic Radiocarbon Dates (Benz ND). Other sources that were used are listed under individual sites.

References Cited

Benz, M. ND. PPND – The Platform for Neolithic Radiocarbon Dates. ex oriente e.V. http://www.exoriente.org/associated_projects/ppnd.php Accessed 23 June 2010.

Böhner, U. and Schyle, D. 2002-2006. Radiocarbon CONTEXT database. http://context-database.uni-koeln.de/ Accessed 1 March 2010 [DOI:10.1594/GFZ.CONTEXT.Ed1].

Bronk Ramsey, C. 2005. OxCal program v3.10. Available online from the Oxford Radiocarbon Accelerator Unit http://c14.arch.ox.ac.uk/embed.php?File=oxcal.html

Reimer, P. J., M. G. L. Baillie, E. Bard, A. Bayliss, J. W. Beck, P. G. Blackwell, C. Bronk Ramsey, et al. 2009. IntCal09 and Marine09 radiocarbon age calibration curves, 0-50,000 years cal BP. *Radiocarbon* 51(4):1111–1150.

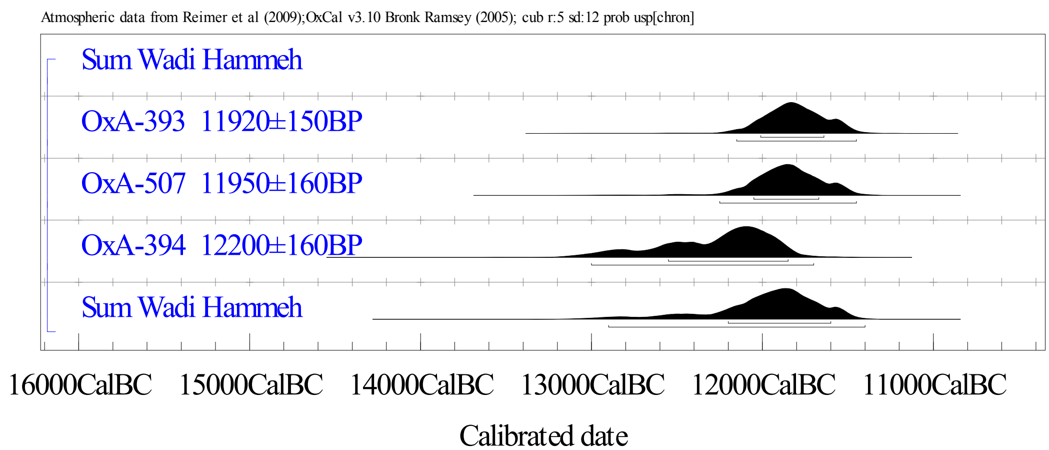
Southern Levant

Ohalo II: c. 21,000 cal BC

The dates available from Ohalo II range between 17,500-21,050 BP and average c. 19,400 BP. Based on observations on the site stratigraphy and formation processes it has been concluded that the site witnessed several occupational episodes, together lasting for no more than a few decades at most. The discrepancy between the range of radiocarbon ages and the archaeologically observable duration of occupation has been attributed to the statistical limitations of the dating method (Nadel et al. 1995).

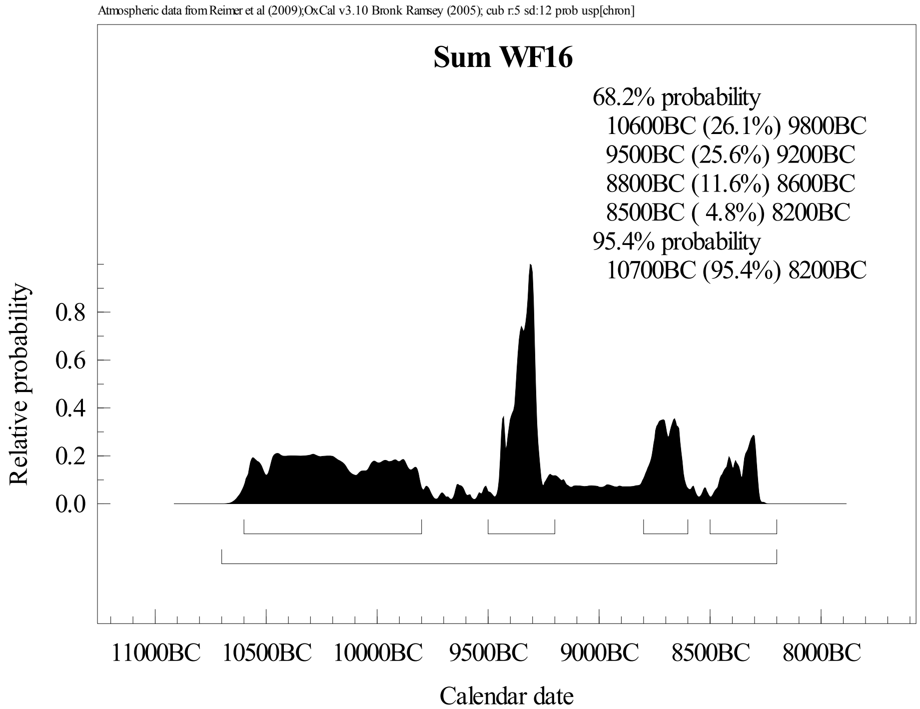
Source: Nadel, D., I. Carmi, and D. Segal. 1995. Radiocarbon dating of Ohalo II: archaeological and methodological implications. *Journal of Archaeological Science* 22:811–82.

Wadi Hammeh: 12,200-11,600 cal BC



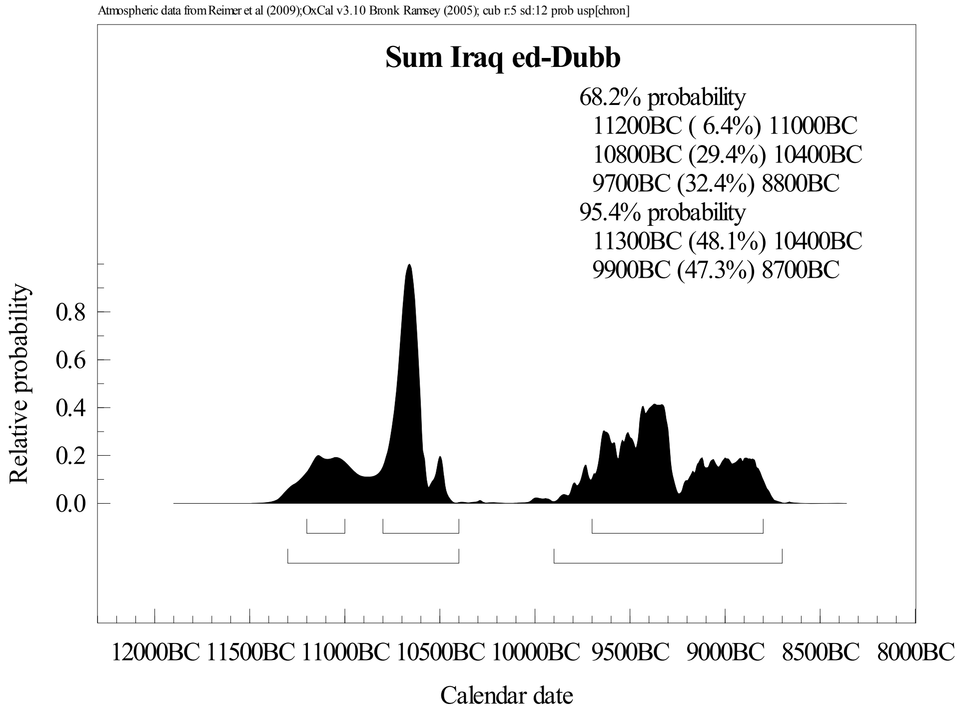
Source: Colledge, S. 2001. *Plant exploitation on Epipalaeolithic and early Neolithic sites in the Levant*. British Archaeological Reports, International Series 986. Oxford: Archaeopress.

Wadi Faynan 16: 10,600-8,200 cal BC



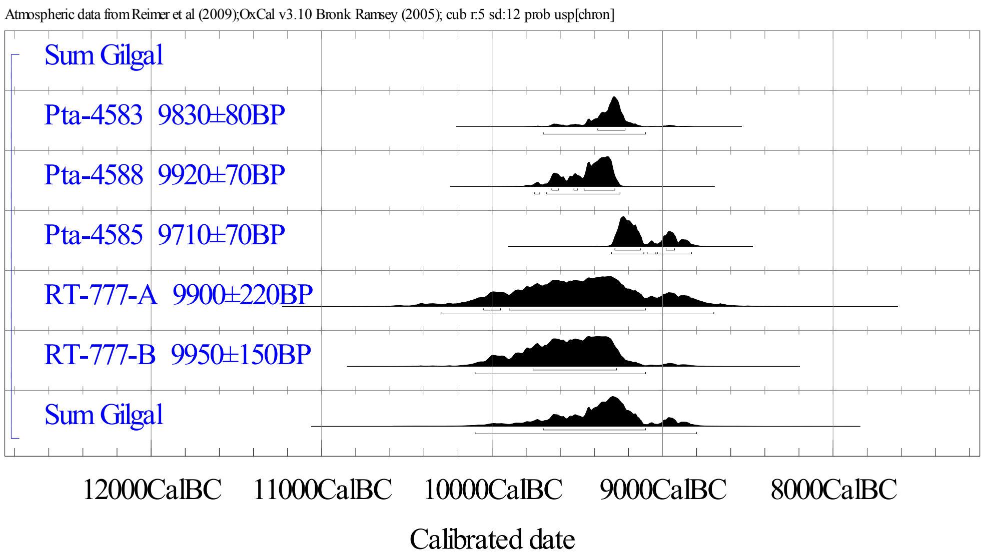
Source: Mithen, S., and B. Finlayson. 2007. WF16 and the Pre-Pottery Neolithic A of the southern Levant. In *The early prehistory of Wadi Faynan, southern Jordan*. B. Finlayson, and S. Mithen, eds. Pp. 470–486. Levant Supplementary Series 4. Oxford: Oxbow.

'Iraq ed-Dubb: 11,200-8800 cal BC (PPNA phase: 9660-8800 cal BC)



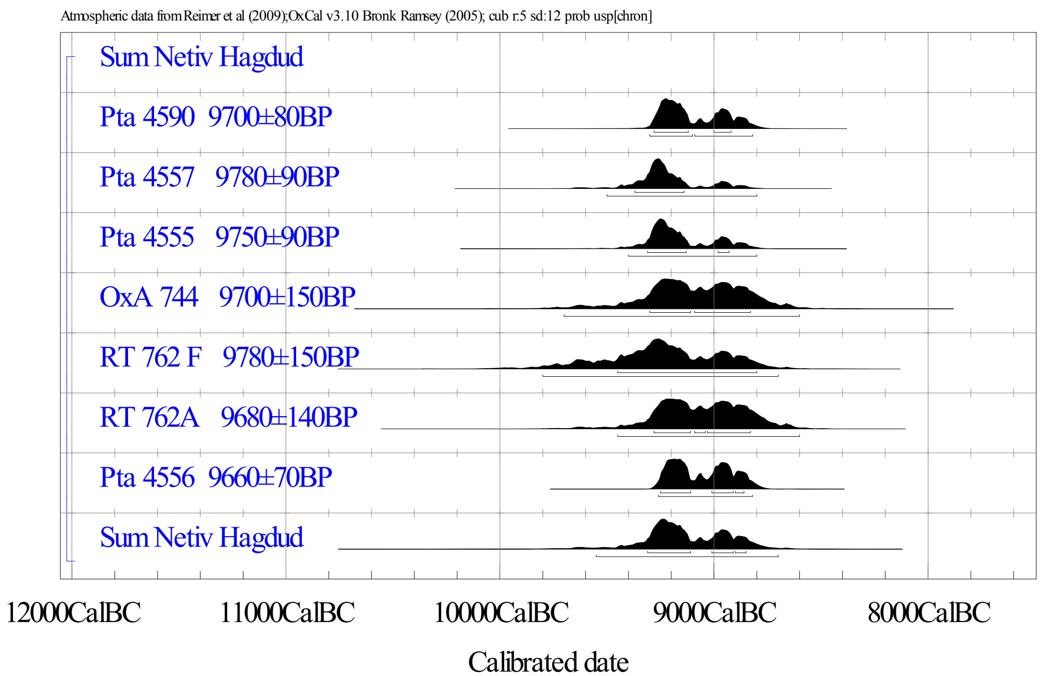
Source: Kuijt, I. 2004. Pre-Pottery Neolithic A and Late Natufian at 'Iraq ed-Dubb, Jordan. *Journal of Field Archaeology* 29 (3/4):291–308.

Gilgal I: 9550-9100 cal BC



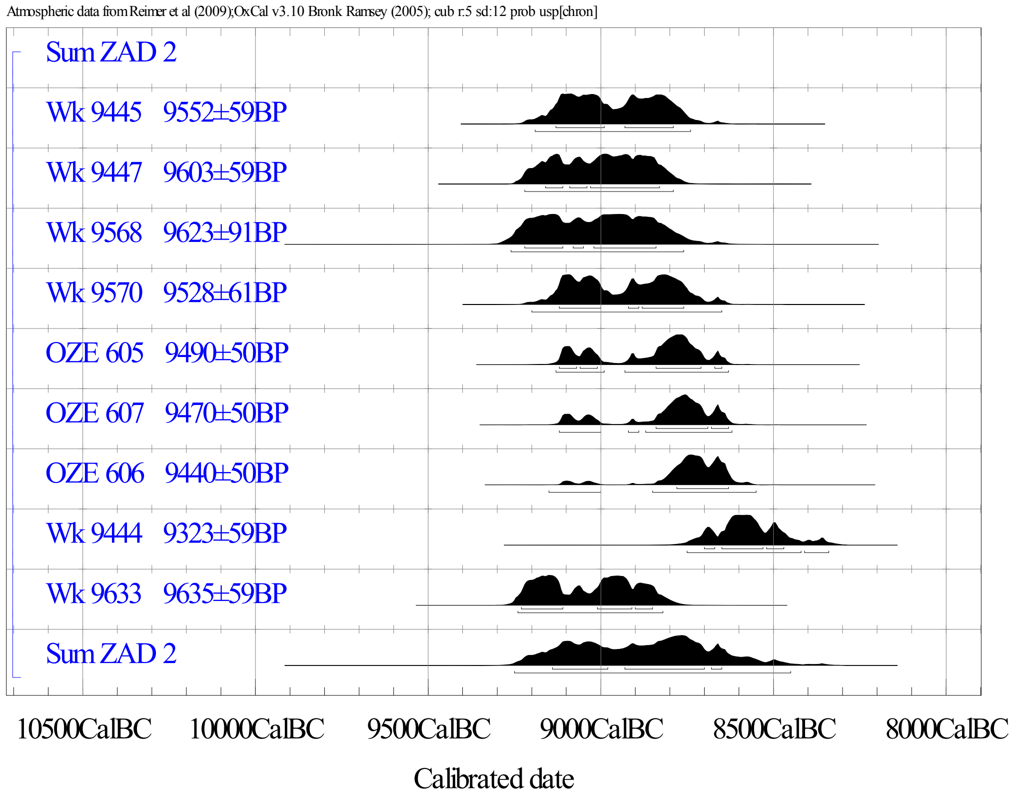
Source: PPND – The Platform for Neolithic Radiocarbon Dates.

Netiv Hagdud: 9310-8850 cal BC



Source: Bar-Yosef, O., A. Gopher, E. Tchernov, and M. E. Kislev. 1991. Netiv Hagdud: an early Neolithic village site in the Jordan Valley. *Journal of Field Archaeology* 18:405–424.

Zahrat adh-Dhra‘ 2 (ZAD 2): 9160-8830 cal BC



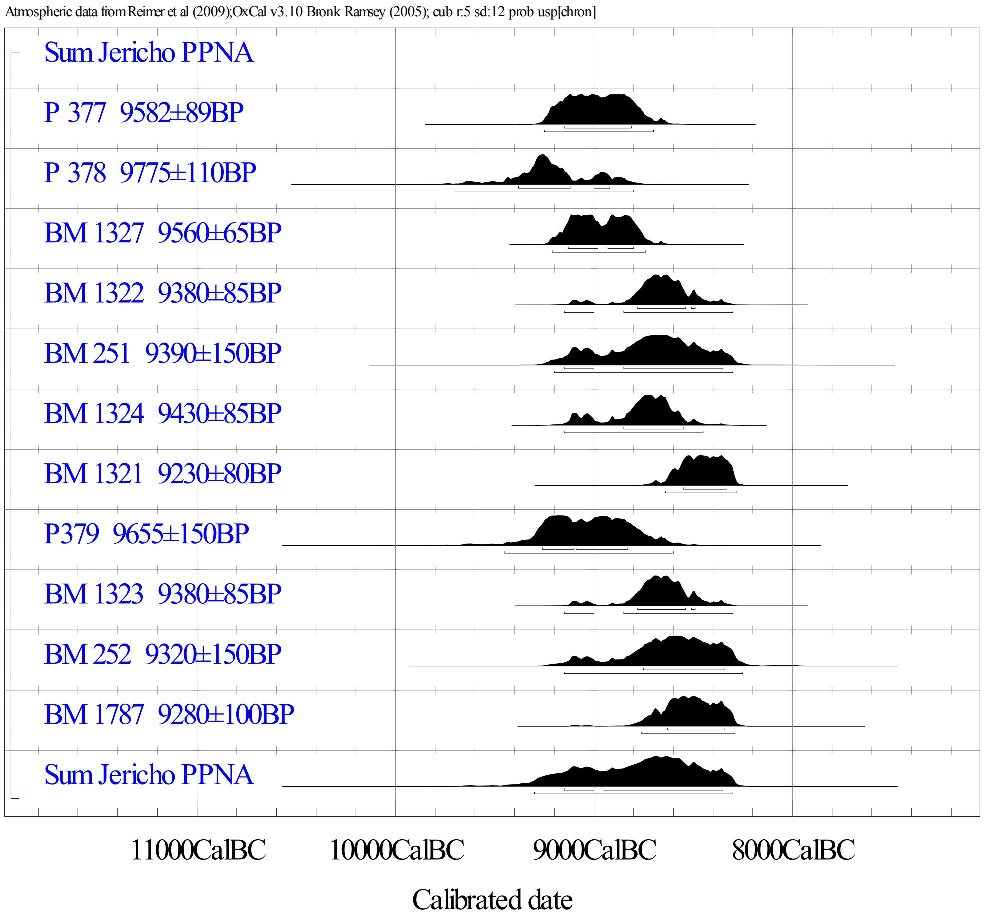
Source: Edwards, P. C., J. Meadows, G. Sayej, and M. Westaway. 2004. From the PPNA to the PPNB: new views from the southern Levant after excavations at Zahrat adh-Dhra‘ 2 in Jordan. *Paléorient* 30(2):21–60.

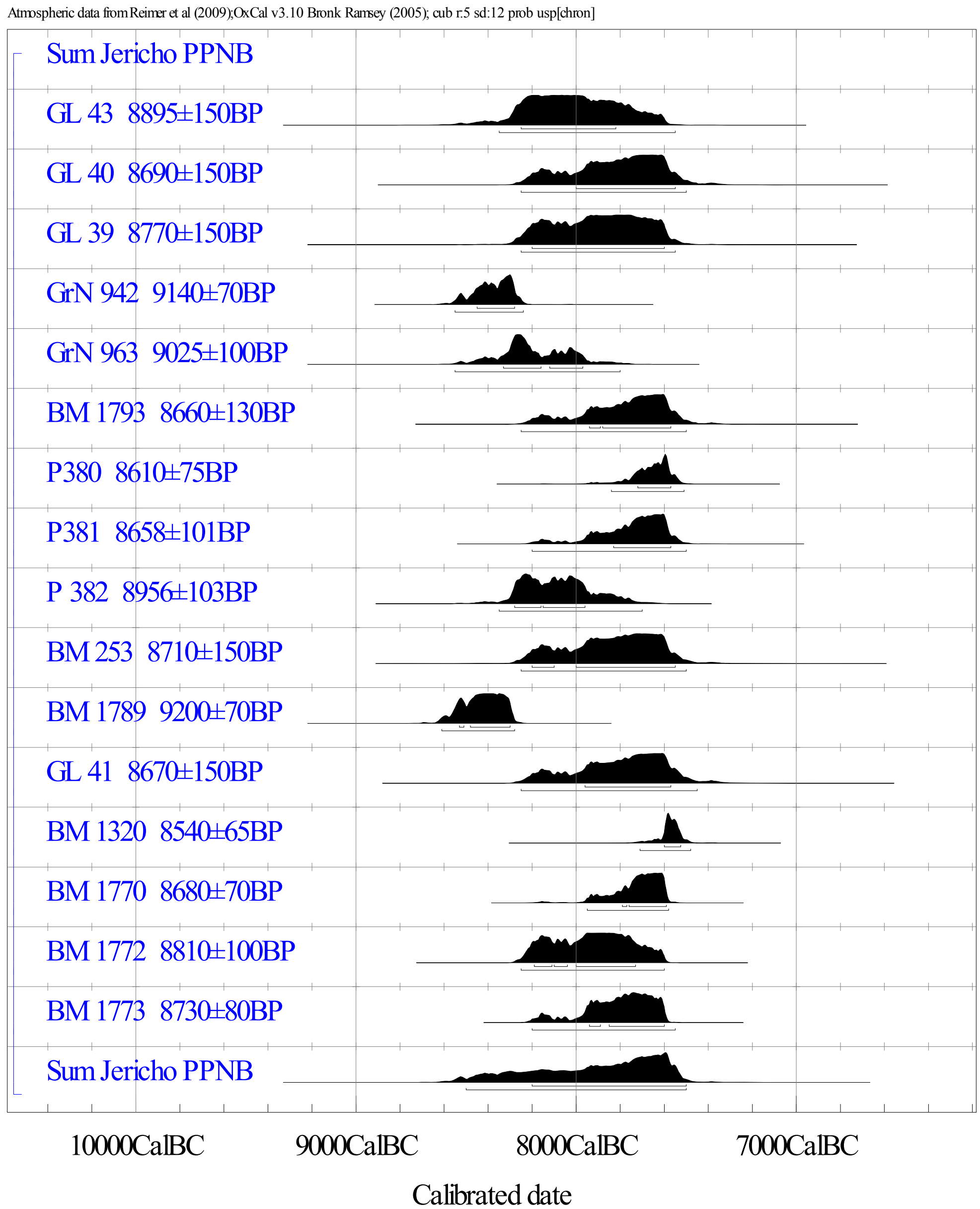
el Hemmeh

White and Makarewicz (2012) report that a hearth from this site produced a single radiocarbon date of 11,100-10,610 cal. BP.

Source: White, C. E., and C. A. Makarewicz. 2012. Harvesting practices and early Neolithic barley cultivation at el-Hemmeh, Jordan. *Vegetation History and Archaeobotany* 21:85–94.

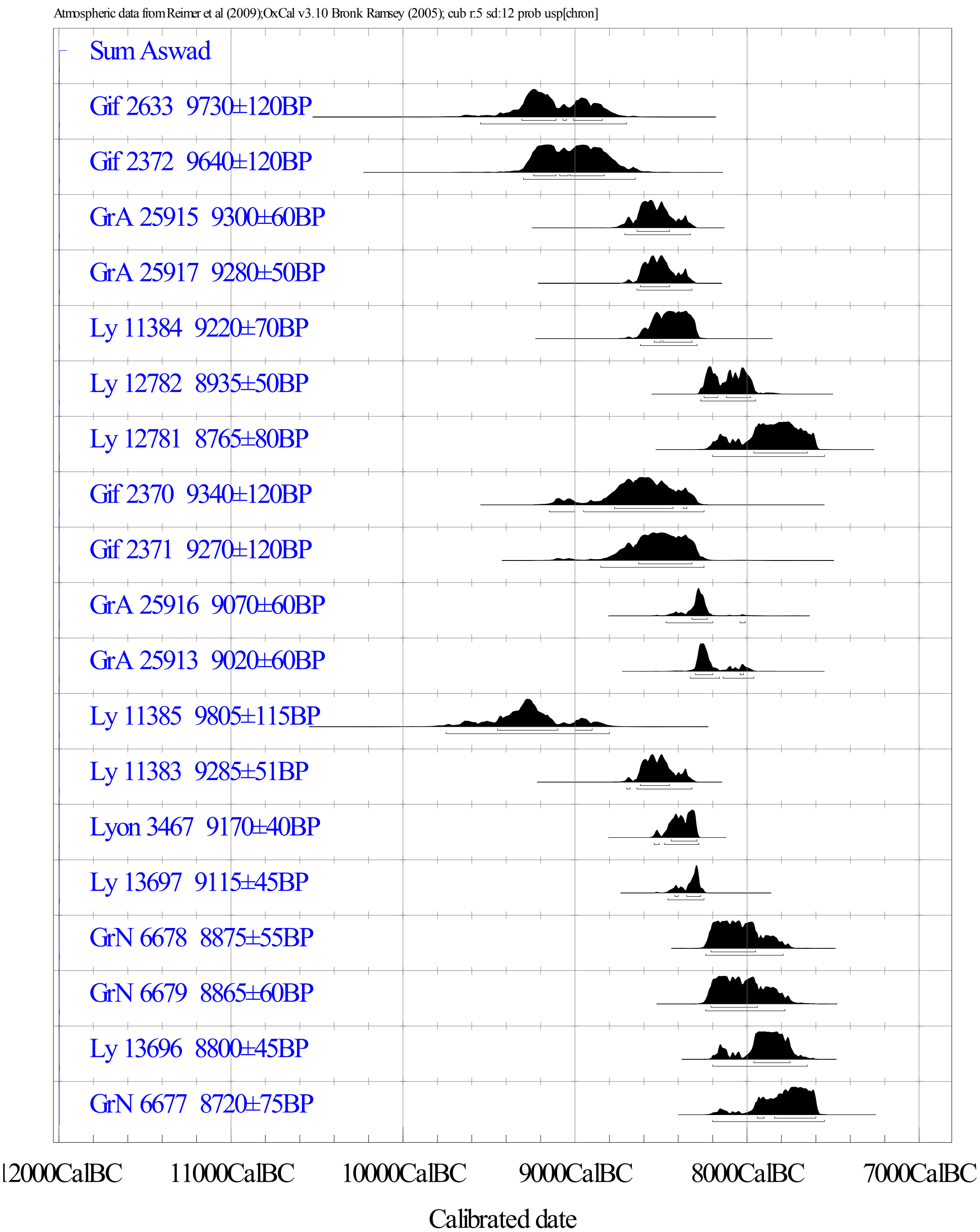
Jericho I, II: 9150-8350 cal BC; ?8200-7500 cal BC

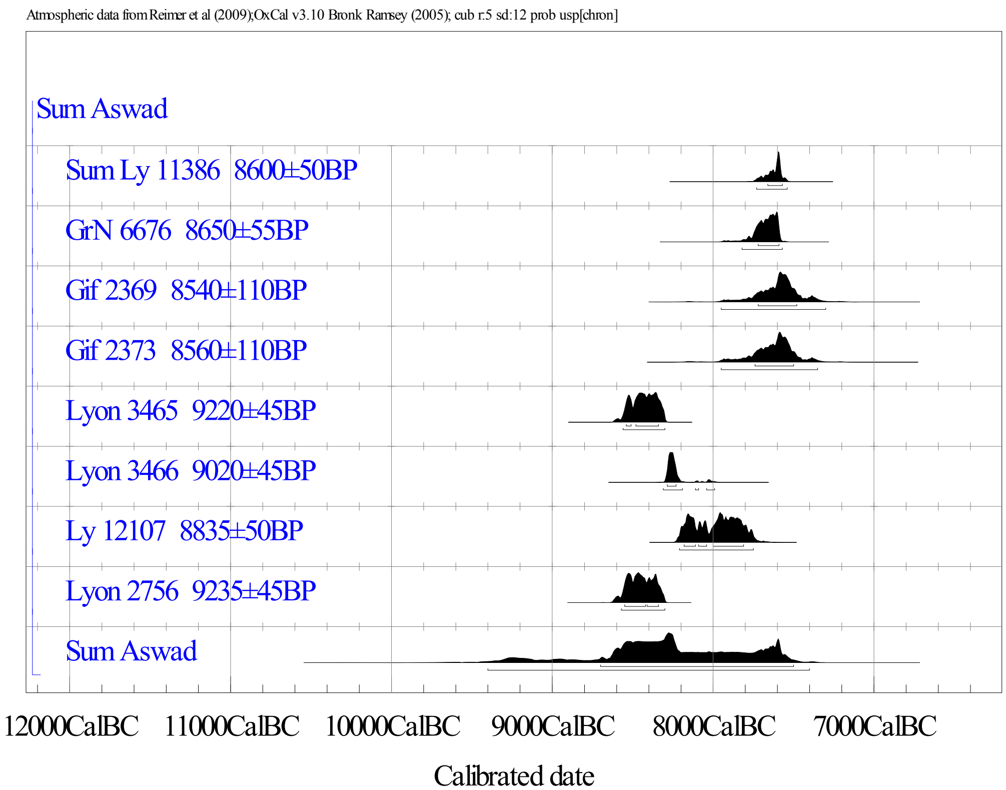




Source: PPND – The Platform for Neolithic Radiocarbon Dates.

Tell Aswad: 8700-7500 cal BC

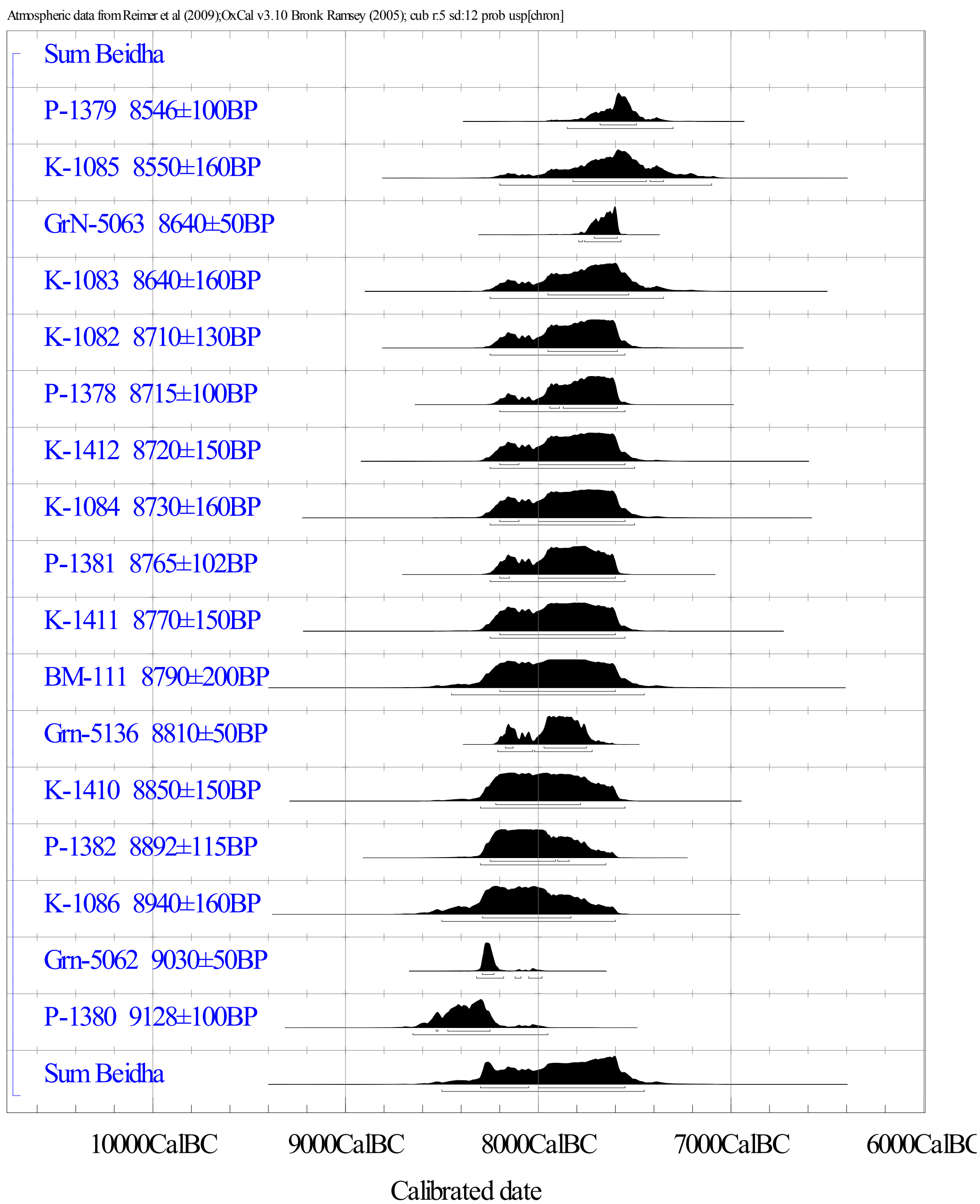




Early PPN phases at Tell Aswad are likely to start at c. 8700 cal BC. Further specification of the phasing of the site must await final publication of recent excavations. For a commentary on the Aswad stratigraphy and the problems of correlating it with the available radiocarbon dates see PPND – The Platform for Neolithic Radiocarbon Dates and references therein.

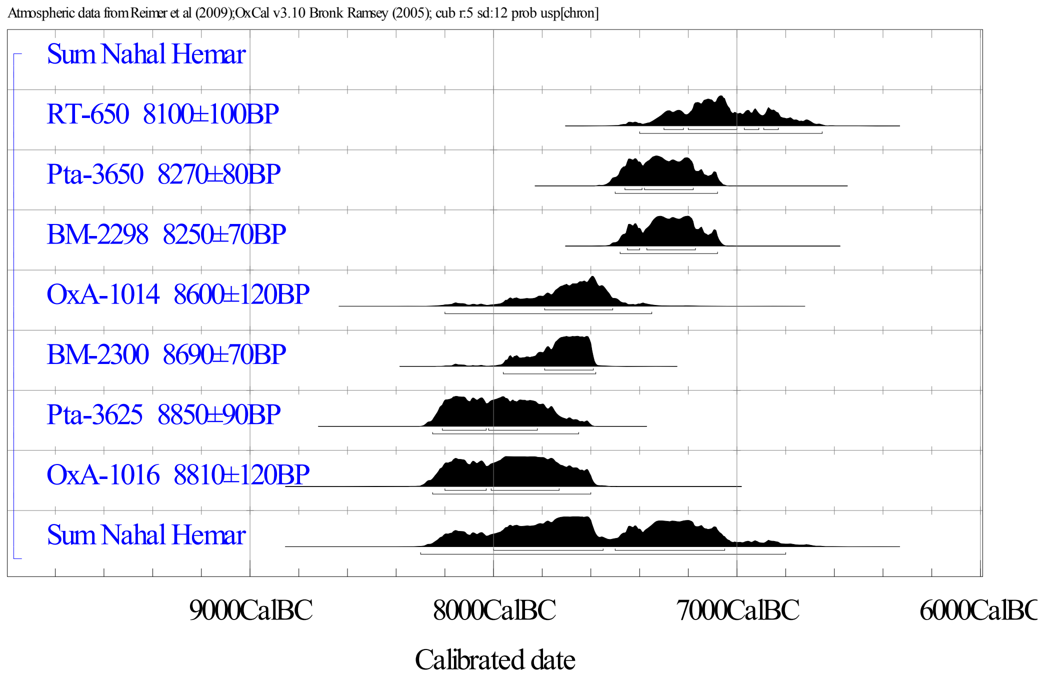
Source: PPND – The Platform for Neolithic Radiocarbon Dates.

Beidha: 8300-7550 cal BC



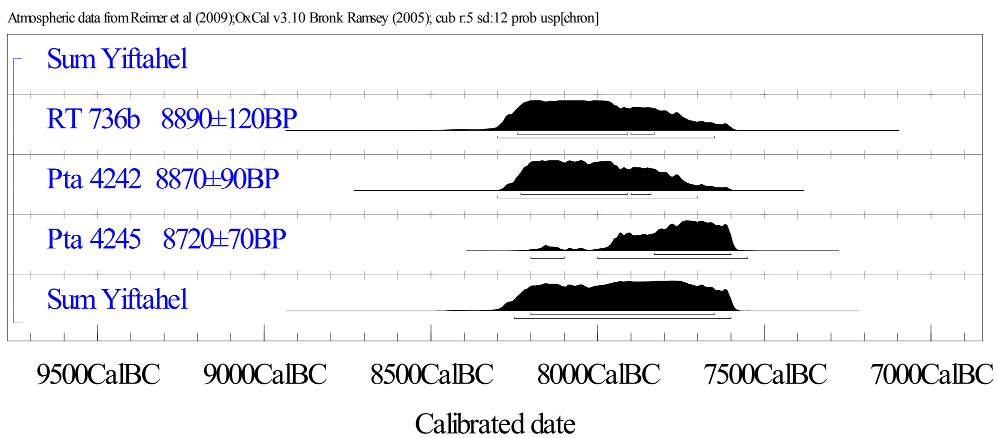
Source: Colledge, S. 2001. *Plant exploitation on Epipalaeolithic and early Neolithic sites in the Levant*. British Archaeological Reports, International Series 986. Oxford: Archaeopress.

Nahal Hemar: 8000-7050 cal BC



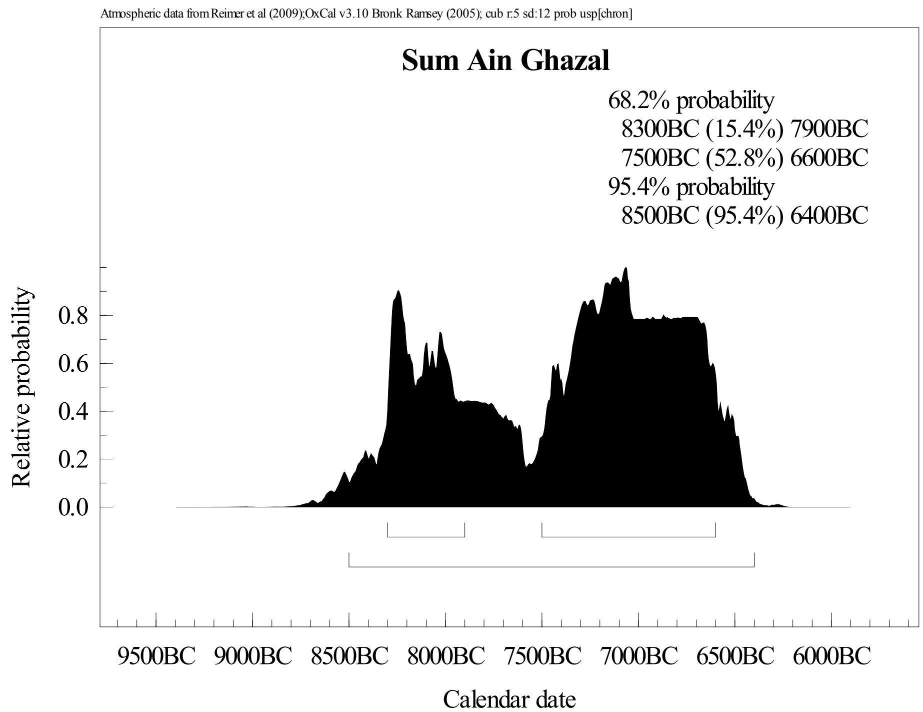
Source: Bar-Yosef, O. 1995. Earliest food producers – Pre-Pottery Neolithic (8000-5500), in *The archaeology of society in the Holy Land*. T. E. Levy, ed. Pp. 190–204. Leicester: Leicester University Press.

Yiftahel: 8200-7650 cal BC



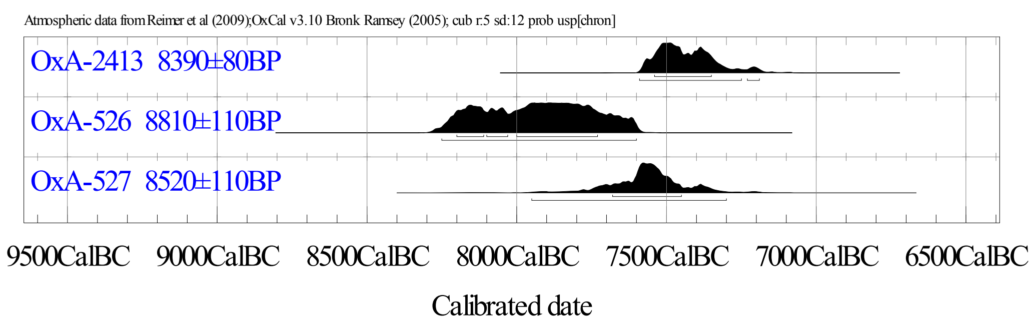
Source: Garfinkel, Y. 1987. Yiftahel: A Neolithic village from the seventh millennium BC in Lower Galilee, Israel. *Journal of Field Archaeology* 14:199–212.

‘**Ain Ghazal:** 8300-6600 cal BC



Source: PPND – The Platform for Neolithic Radiocarbon Dates

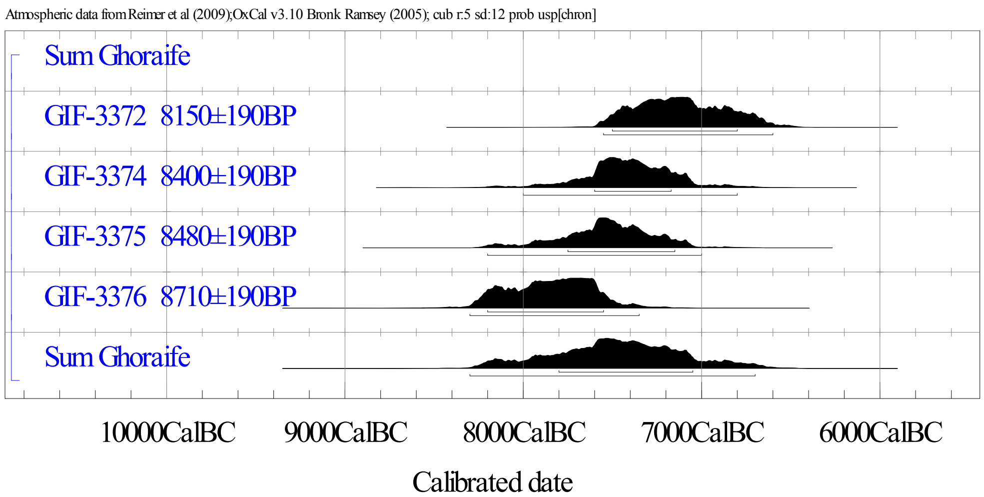
Wadi Jilat 7: 8200-7350 cal BC



The lack of overlap between the early date and the late ones is consistent with the stratigraphy of the site indicating two distinct phases of occupation.

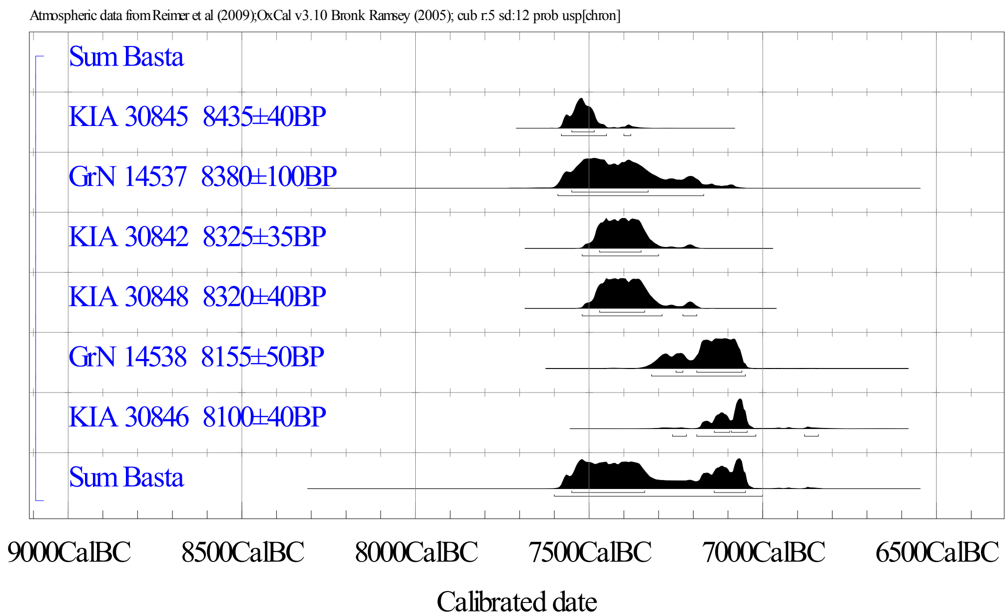
Source: PPND – The Platform for Neolithic Radiocarbon Dates.

Ghoraife: 7800-7050 cal BC



Source: Colledge, S. 2001. *Plant exploitation on Epipalaeolithic and early Neolithic sites in the Levant.* British Archaeological Reports, International Series 986. Oxford: Archaeopress.

Basta: 7550-7050 cal BC

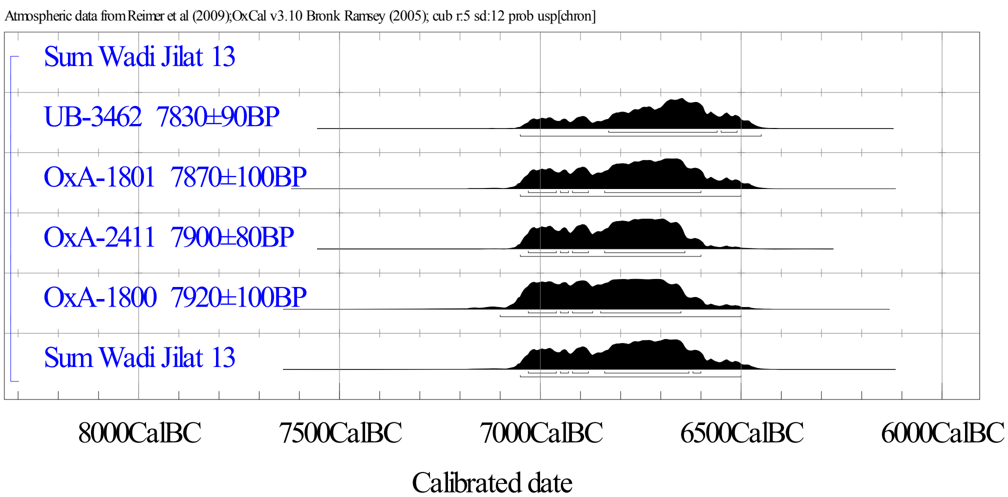


Source: PPND – The Platform for Neolithic Radiocarbon Dates.

Wadi Fidan A
This is a site attributed to the LPPNB. We are unaware of any radiocarbon dates published from this site. The LPPNB of the Southern Levant is dated between ~7300 and 6750 BC (Kuijt and Goring-Morris 2002). We have therefore assigned to the Wadi Fidan A botanical assemblage the median estimate of 7100 BC.

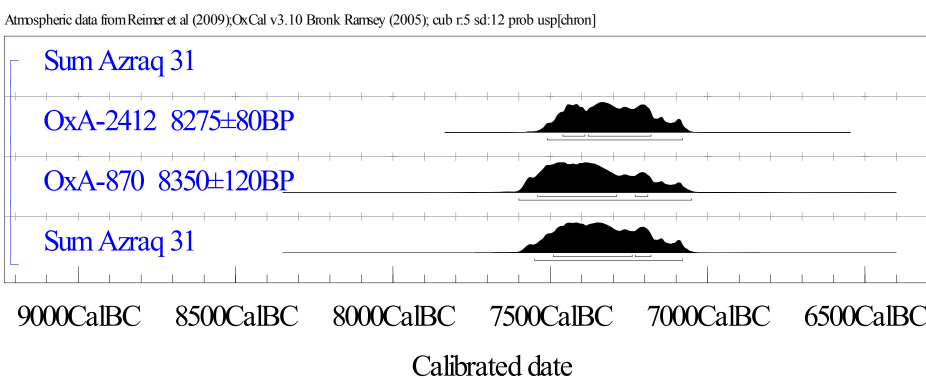
Sources: Colledge, S. 2001. *Plant exploitation on Epipalaeolithic and early Neolithic sites in the Levant*. British Archaeological Reports, International Series 986. Oxford: Archaeopress; Kuijt, I., and N. Goring-Morris. 2002. Foraging, farming, and social complexity in the Pre-Pottery Neolithic of the southern Levant: a review and synthesis. *Journal of World Prehistory* 16(4):361–440.

Wadi Jilat 13: 7030-6600 cal BC



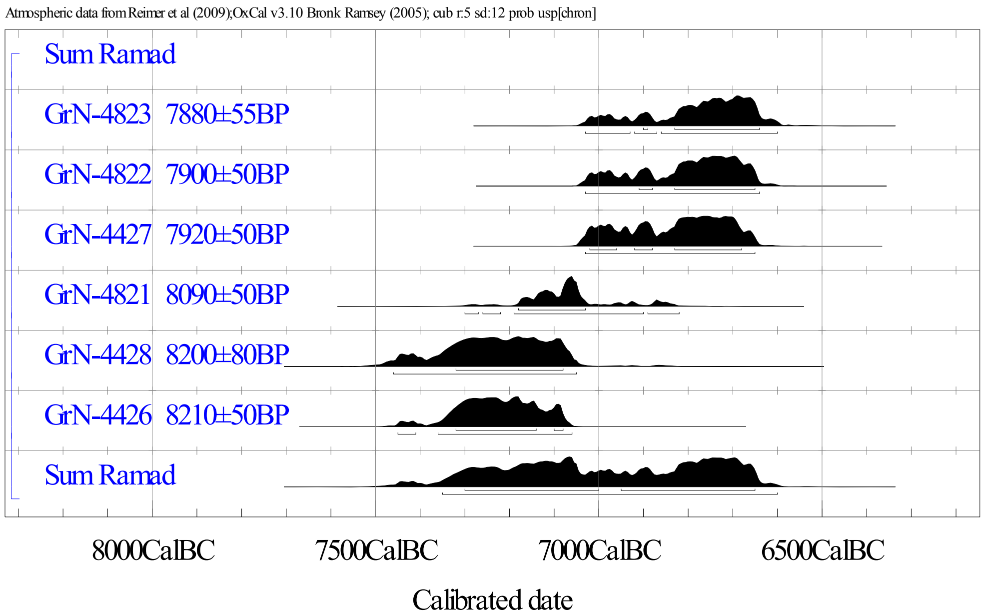
Source: Colledge, S. 2001. *Plant exploitation on Epipalaeolithic and early Neolithic sites in the Levant*. British Archaeological Reports, International Series 986. Oxford: Archaeopress.

Azraq 31: 7490-7180 cal BC



Source: Colledge, S. 2001. *Plant exploitation on Epipalaeolithic and early Neolithic sites in the Levant*. British Archaeological Reports, International Series 986. Oxford: Archaeopress.

Tell Ramad: 7300-6650 cal BC

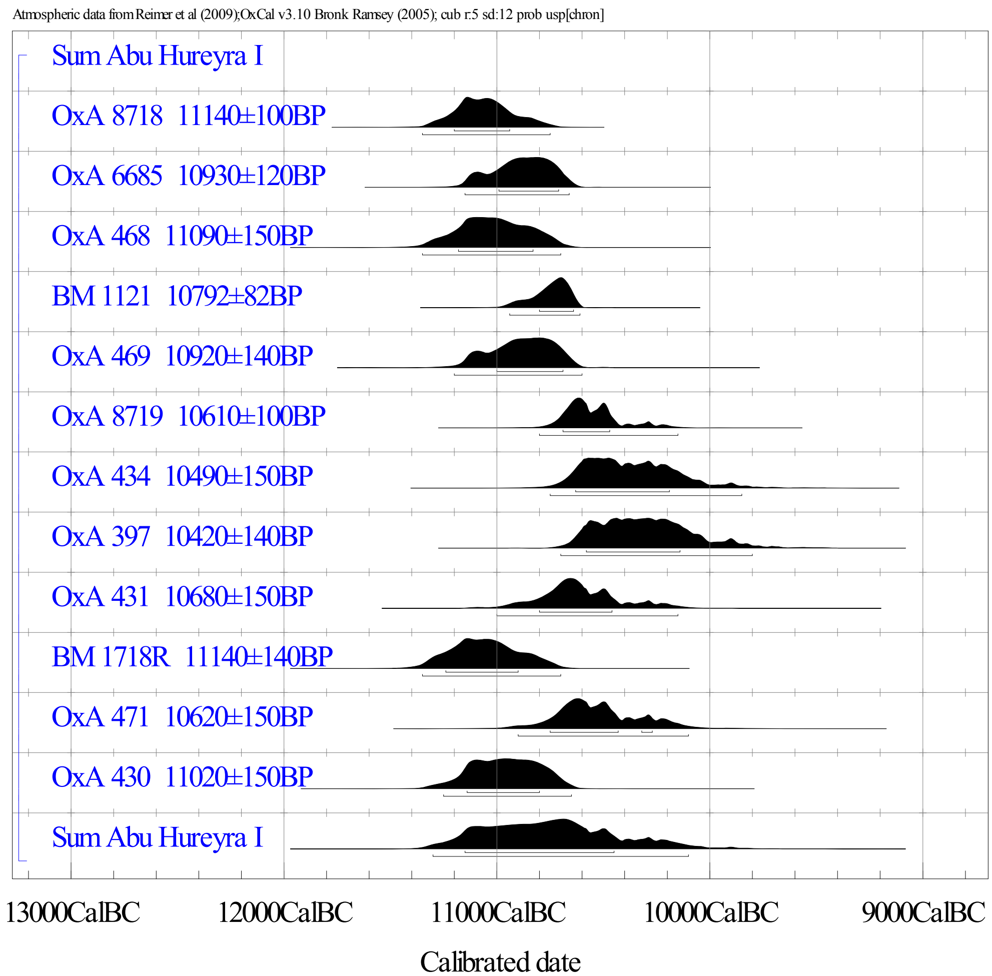


Ramad is anchored by 6 radiocarbon dates, which indicate two modalities in agreement with the phasing of the site in two periods. The earlier mode focuses on 7100 BC and the later on 6700 BC.

Source: Colledge, S. 2001. *Plant exploitation on Epipalaeolithic and early Neolithic sites in the Levant.* British Archaeological Reports, International Series 986. Oxford: Archaeopress.

Northern Syria and middle Euphrates

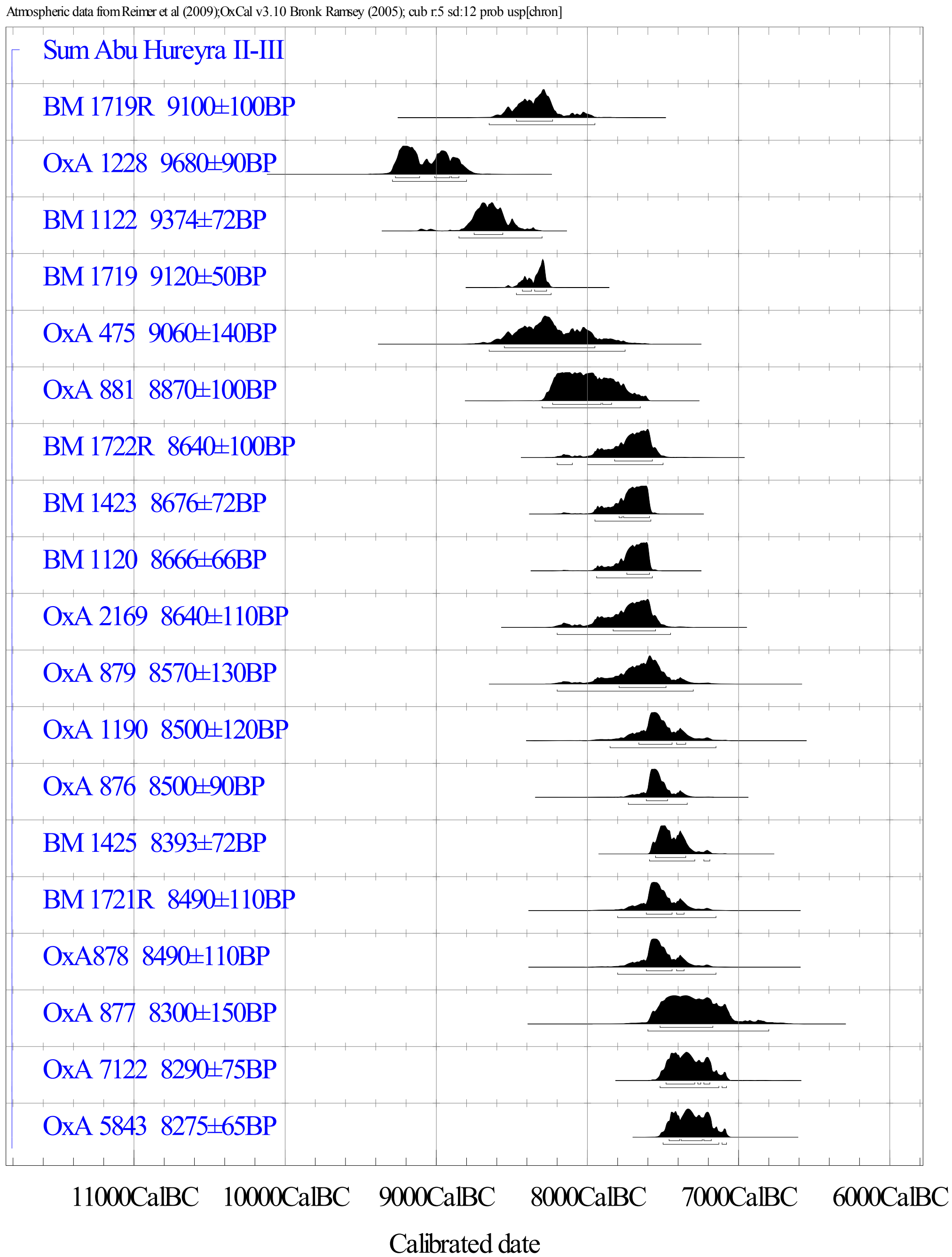
Abu Hureyra I: 11,150-10,450 cal BC

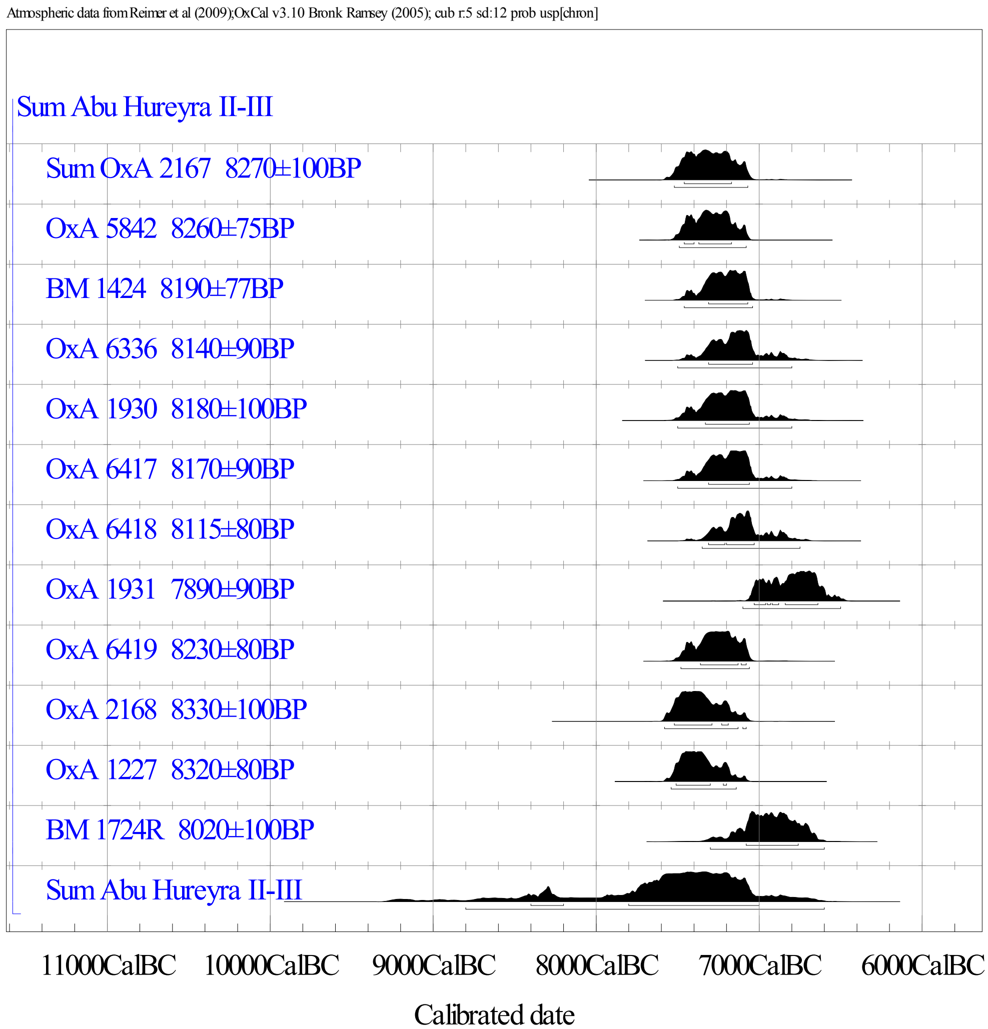


Source: Moore, A. M. T., G. C. Hillman, and A. J. Legge. 2000. *Village on the Euphrates. From foraging to farming at Abu Hureyra*. New York: Oxford University Press.

Asouti, Eleni, and Dorian Q Fuller. A Contextual Approach to the Emergence of Agriculture in Southwest Asia: Reconstructing Early Neolithic Plant-Food Production. Supplement A: Primary Sources of Archaeobotanical Datasets and Radiocarbon Dates from Southwest Asia. *Current Anthropology* 54(3).

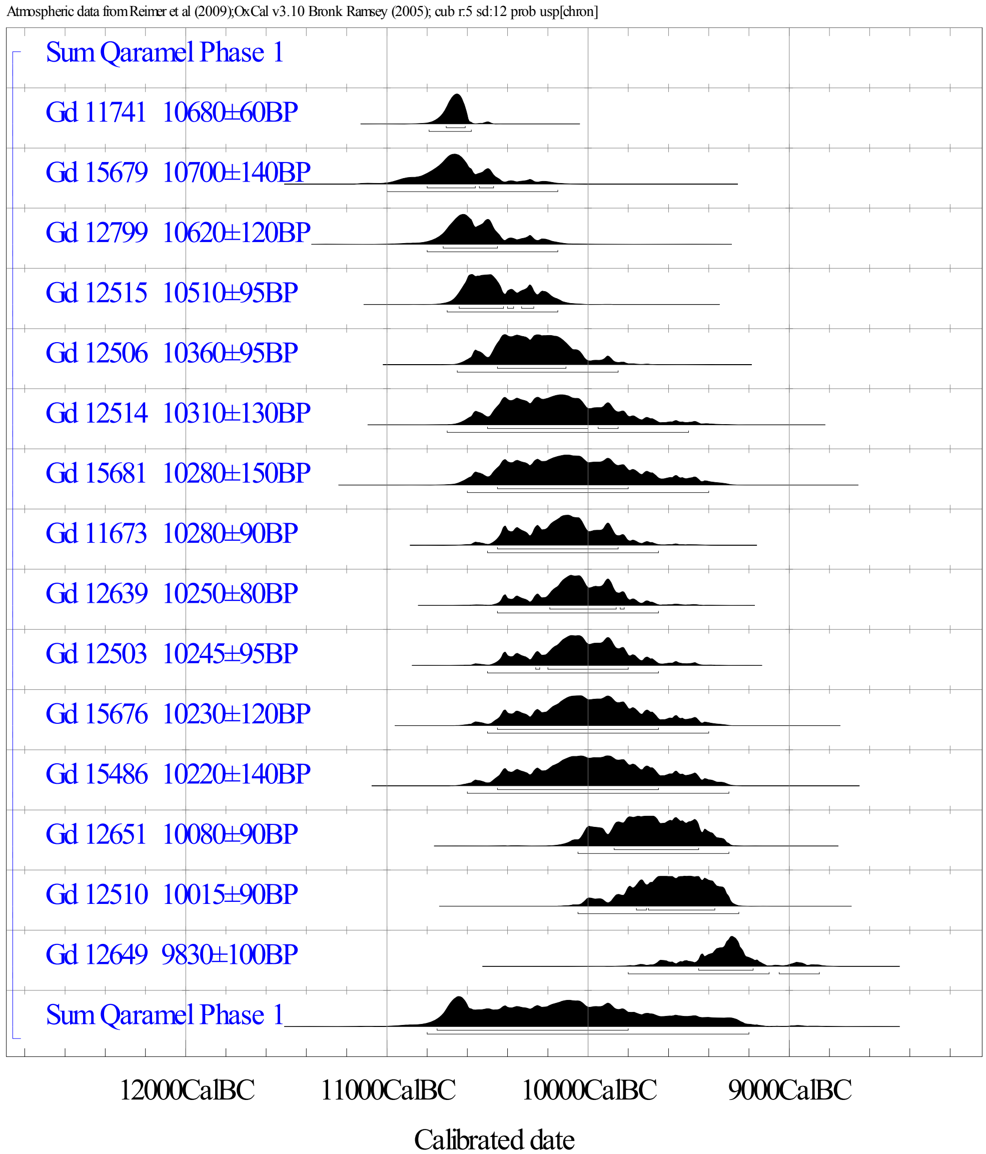
Abu Hureyra II-III: 7800-7000 cal BC

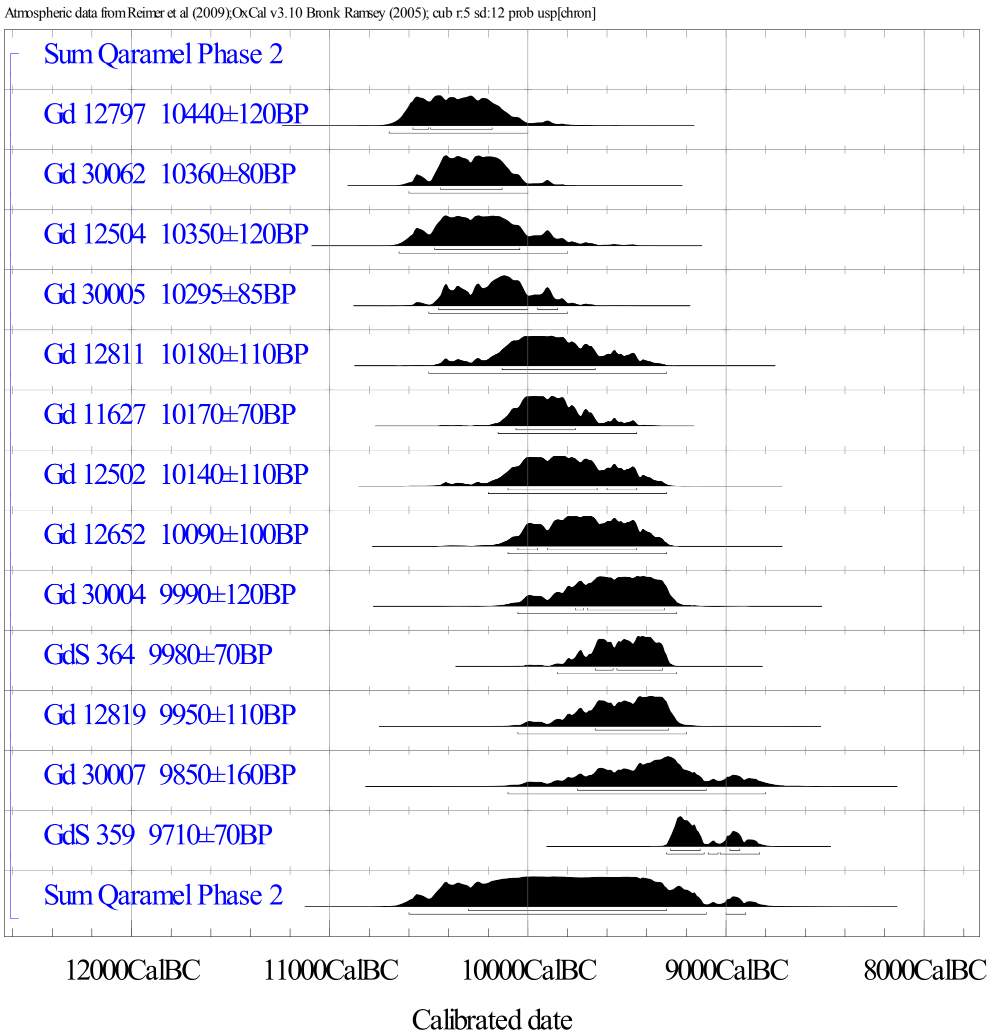


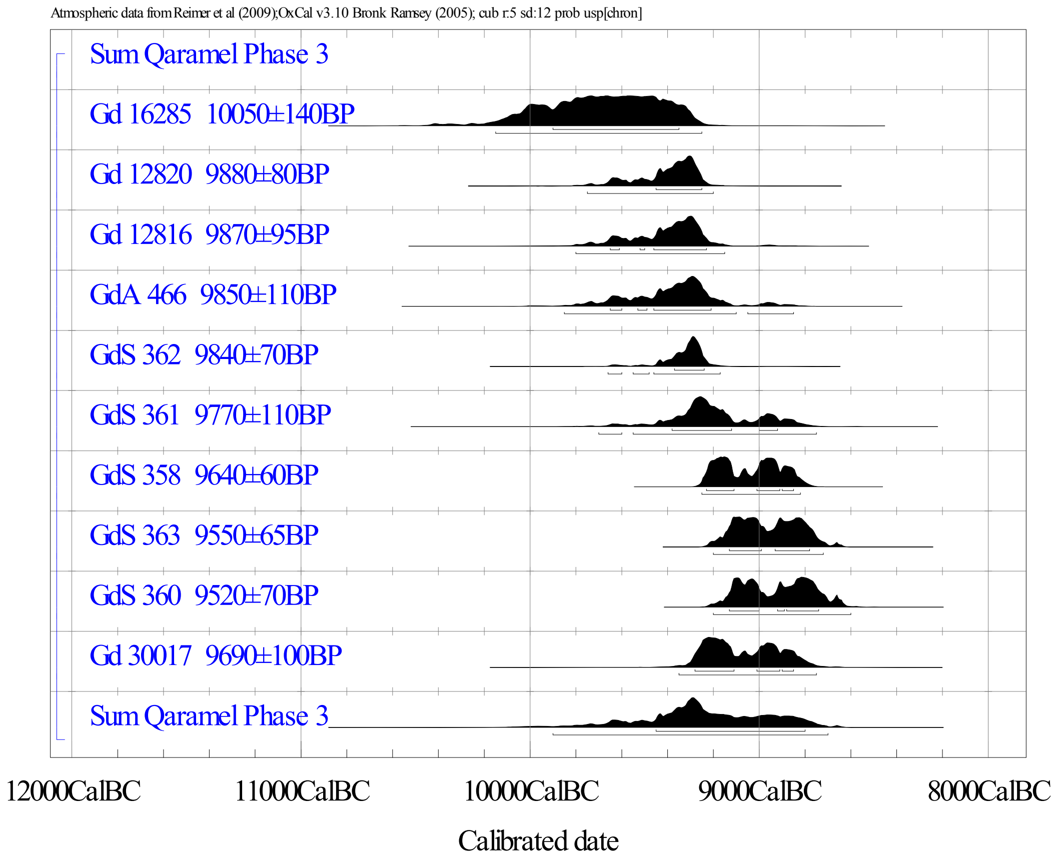


Source: Moore, A. M. T., G. C. Hillman, and A. J. Legge. 2000. *Village on the Euphrates. From foraging to farming at Abu Hureyra.* New York: Oxford University Press.

Tell Qaramel: H1: 10,750-9800 cal BC; H2: 10,300-9300 cal BC; H3: 9450-8800 cal BC



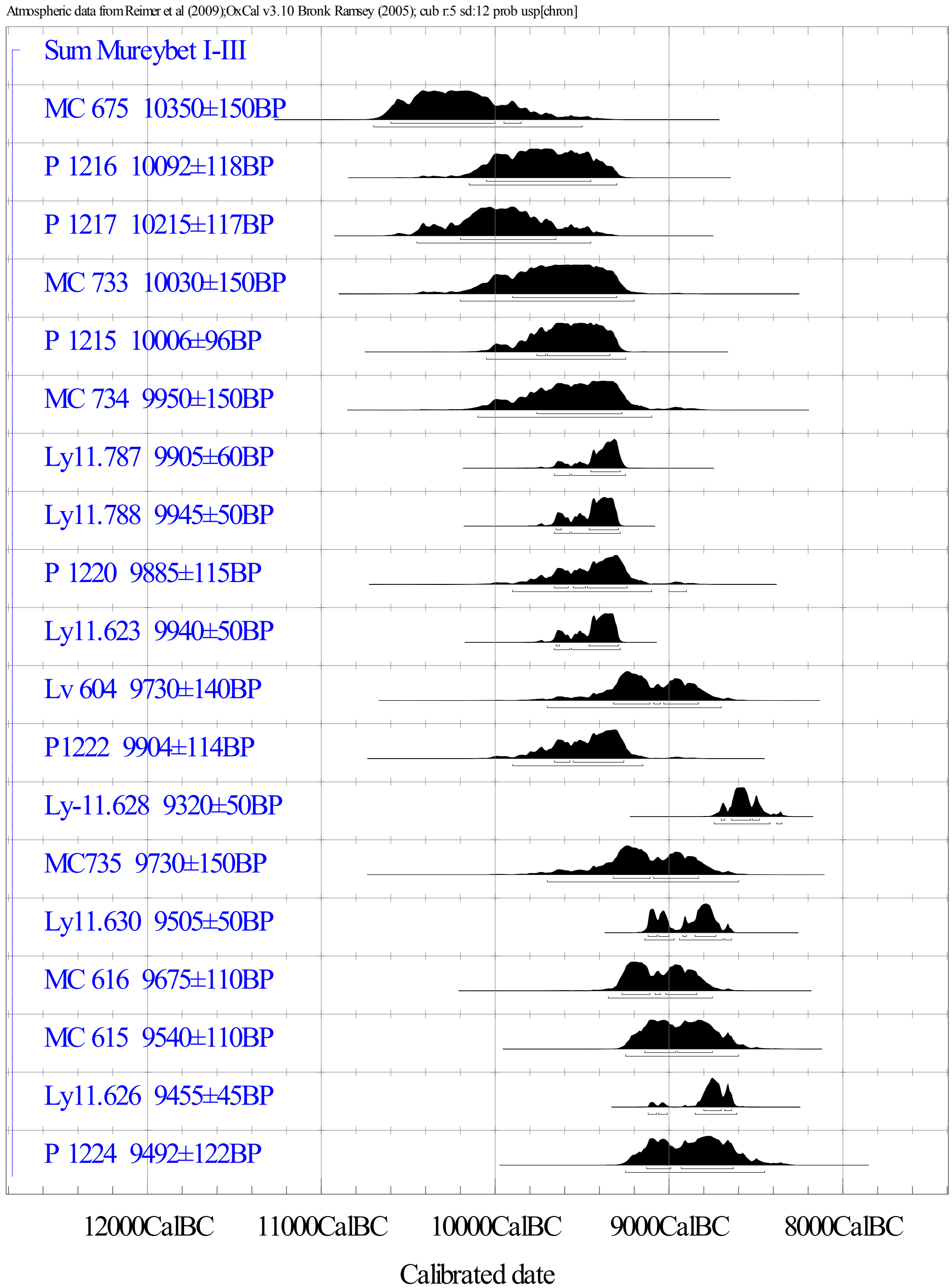

Atmospheric data from Reimer et al (2009);OxCal v3.10 Bronk Ramsey (2005); cub r:5 sd:12 prob usp[chron]
Sum Qaramel Phase 2
Gd 12797 10440±120BP
Gd 30062 10360±80BP
Gd 12504 10350±120BP
Gd 30005 10295±85BP
Gd 12811 10180±110BP
Gd 11627 10170±70BP
Gd 12502 10140±110BP
Gd 12652 10090±100BP
Gd 30004 9990±120BP
GdS 364 9980±70BP
Gd 12819 9950±110BP
Gd 30007 9850±160BP
GdS 359 9710±70BP
Sum Qaramel Phase 2
12000CalBC
11000CalBC
10000CalBC
9000CalBC
8000CalBC
Calibrated date

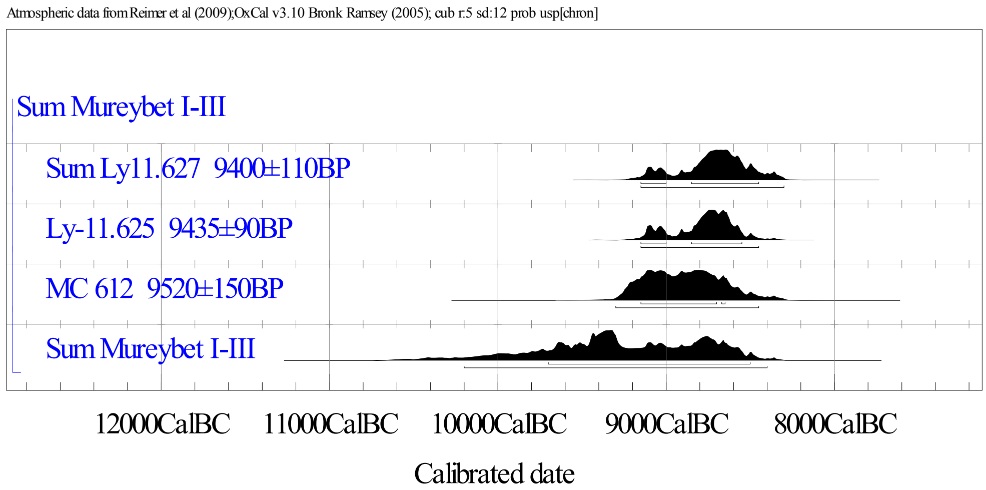


Mazurowski et al. (2009) report that flotation samples were retrieved from all three phases but mostly Horizons 2 and 3. Pending further specification of the stratigraphic associations of the botanical assemblages, we have provisionally assigned them to 10,300-8850 cal BC.

Sources: Mazurowski, R. F., D. J. Michczyńska, A. Pazdur, and N. Piotrowska. 2009. Chronology of the early Pre-Pottery Neolithic settlement Tell Qaramel, northern Syria, in the light of radiocarbon dating. *Radiocarbon* 51(2):771–781; Willcox, G., S. Fornite, and L. Herveux. 2008. Early Holocene cultivation before domestication in northern Syria. *Vegetation History and Archaeobotany* 17:313–325.

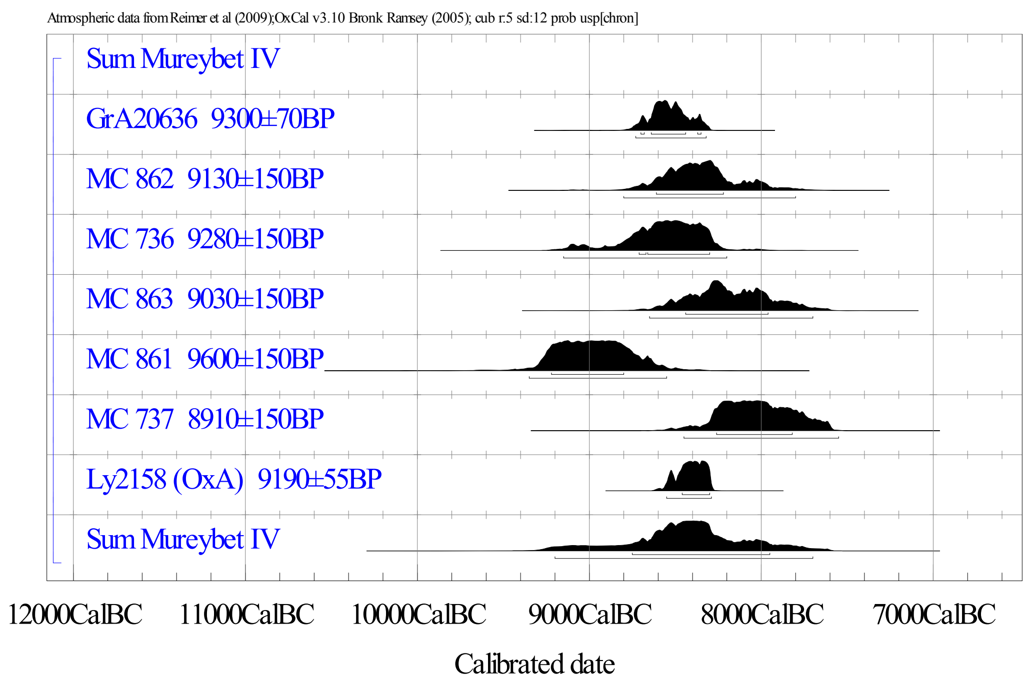
Mureybet I/II-III: 9700-8500 cal BC





Source: PPND – The Platform for Neolithic Radiocarbon Dates.

Mureybet IV: 8750-7850 cal BC

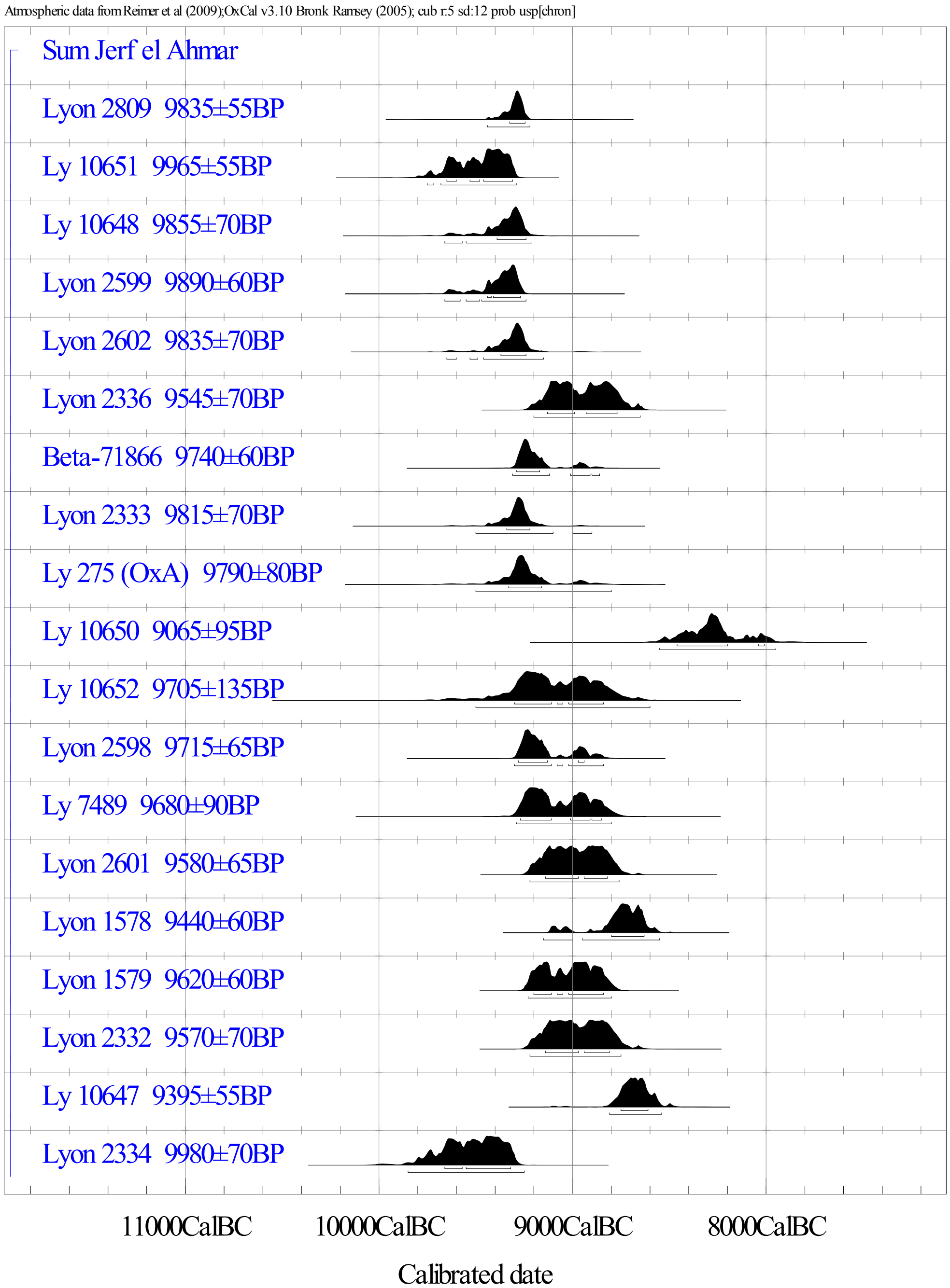


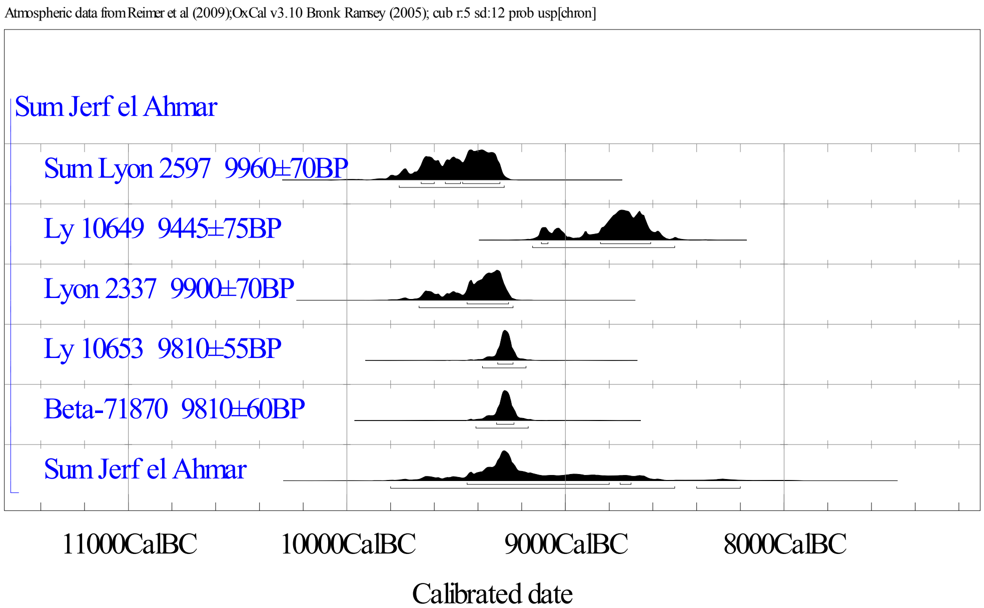
Source: PPND – The Platform for Neolithic Radiocarbon Dates.

Tell 'Abr 3: 9500-9200 cal. BC

Source: Willcox, G., R. Buxo, and L. Herveux 2009. Late Pleistocene and Early Holocene climate and the beginnings of cultivation in northern Syria. *Holocene* 19:151–158.

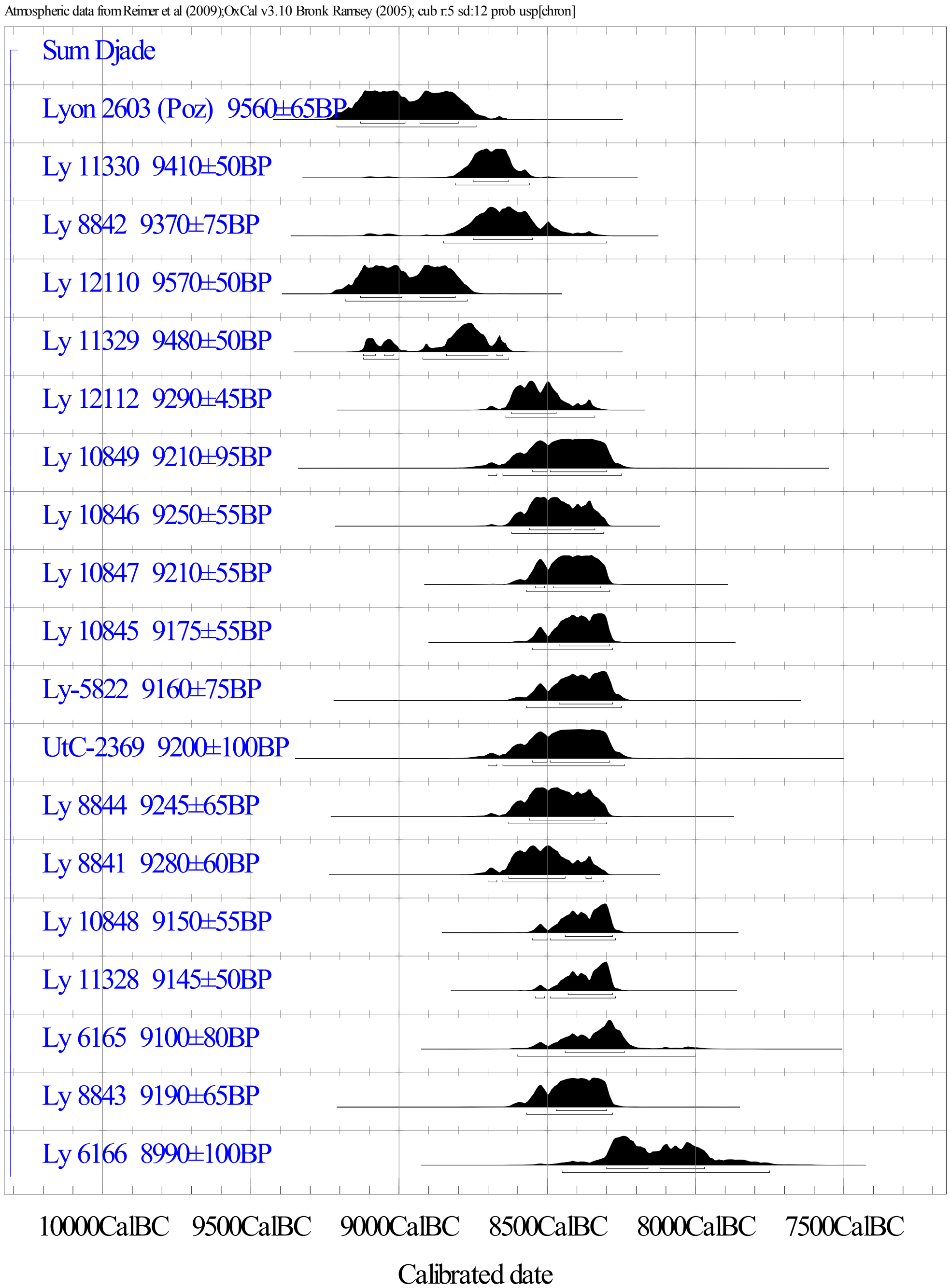
Jerf el Ahmar: 9450-8700 cal BC

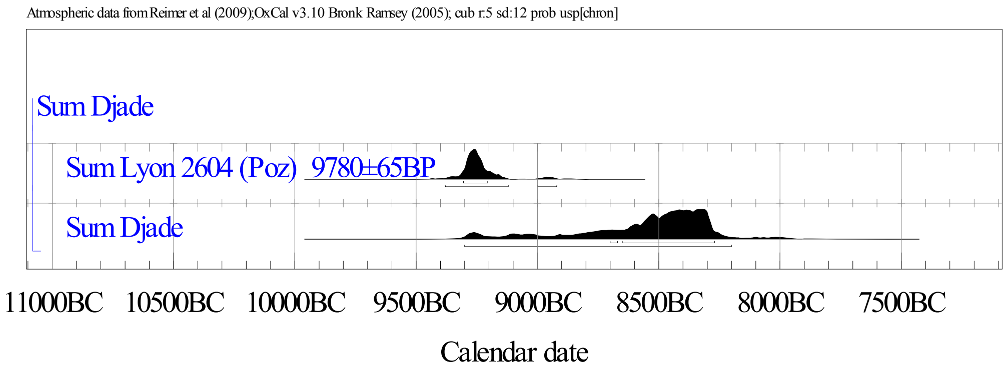




Source: PPND – The Platform for Neolithic Radiocarbon Dates.

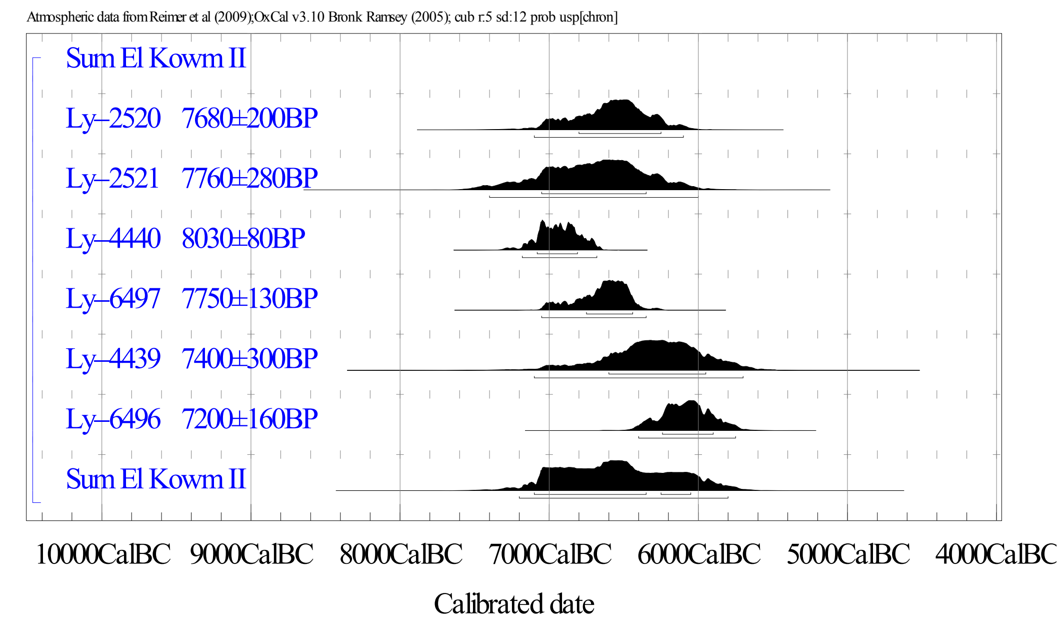
Dja'de: 8700-8270 cal BC





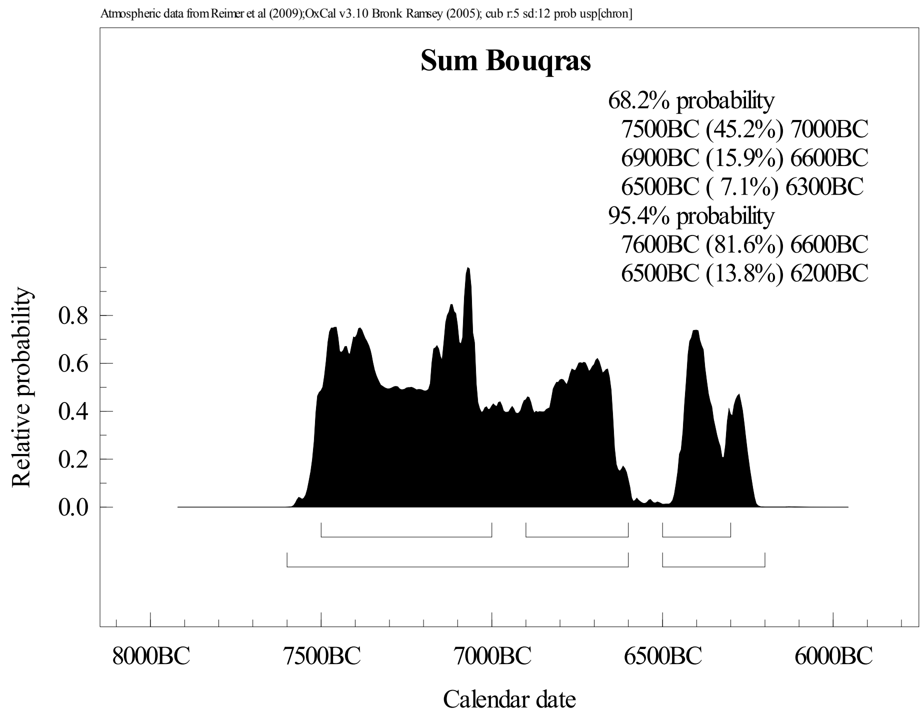
Source: PPND – The Platform for Neolithic Radiocarbon Dates.

El Kowm II: 7100-6350 cal BC



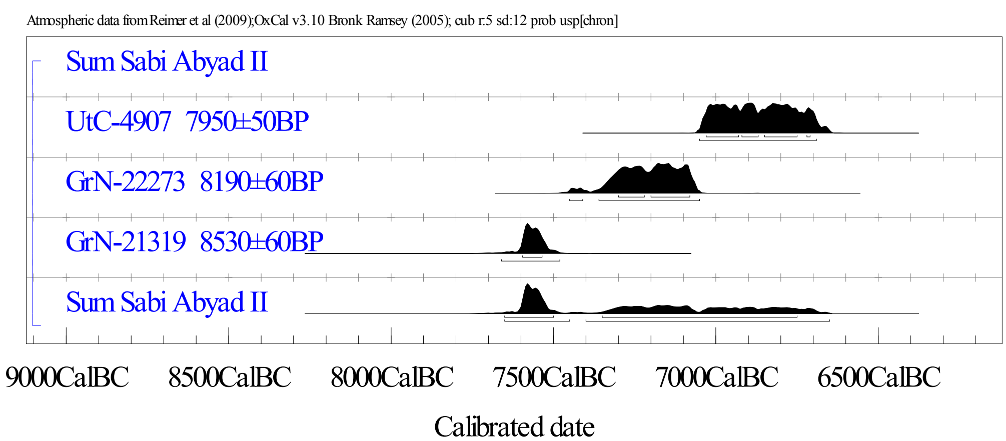
Source: Radiocarbon CONTEXT database.

Tell Bouqras: 7500-6300 cal BC
Setting aside a single anomalously early date, the remaining dates (n=25) provide a calibrated range between 7500-6300 BC, from which we take the median 6900 BC.



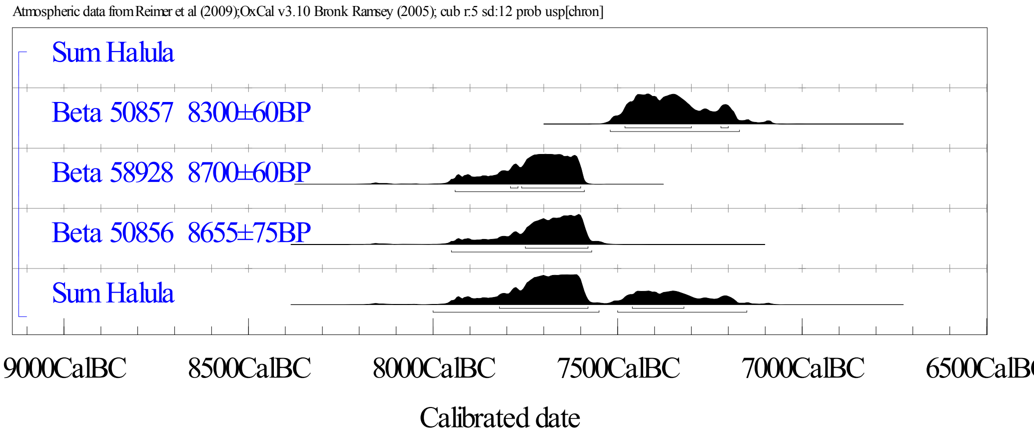
Source: Radiocarbon CONTEXT database.

Sabi Abyad II: 7650-6750 cal BC



Sources: Akkermans, P. 1991. New radiocarbon dates for the Later Neolithic of northern Syria. *Paléorient* 17:121–126; Radiocarbon CONTEXT database.

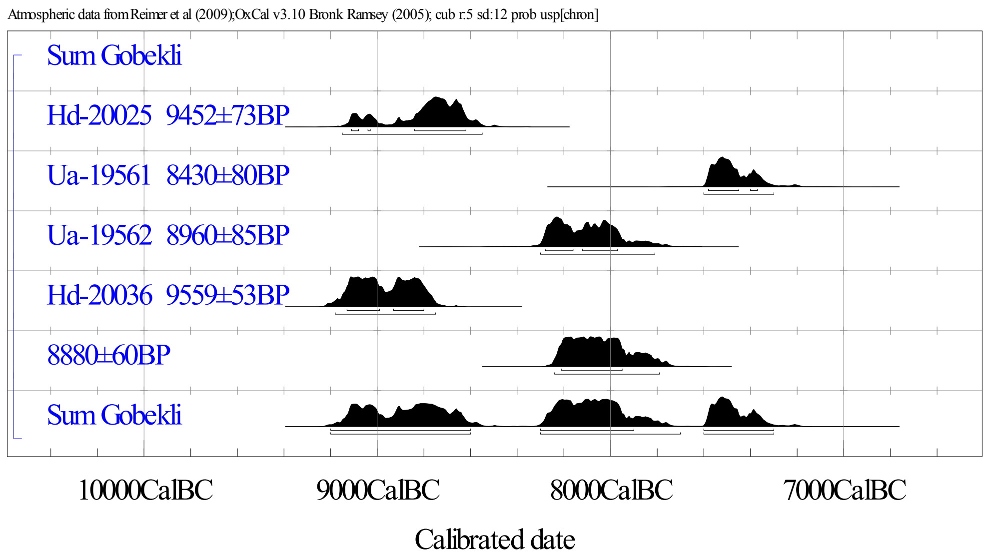
Tell Halula: 7820-7320 cal BC



Source: PPND – The Platform for Neolithic Radiocarbon Dates.

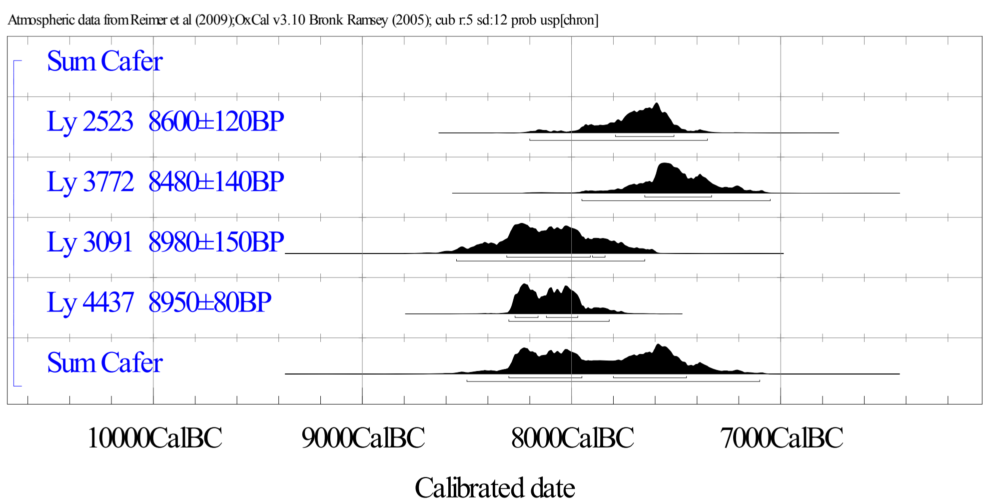
Southeast and Central Anatolia (Turkey)

Göbekli Tepe: 9200-8600 cal BC (PPNA-EPPNB phase)



Source: Peters, J., and K. Schmidt. 2004. Animals in the symbolic world of Pre-Pottery Neolithic Göbekli Tepe, south-eastern Turkey: a preliminary assessment. *Anthropozoologica* 39(1):1–32.

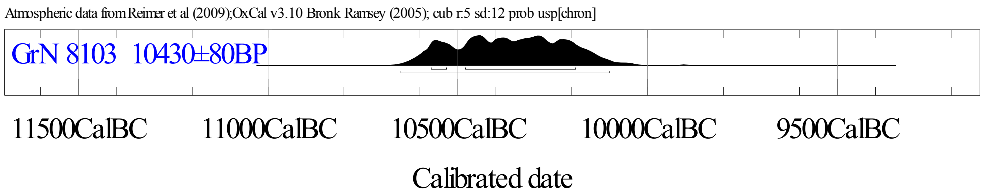
Cafer Höyük XIII-VIII: 8300-7450 cal BC



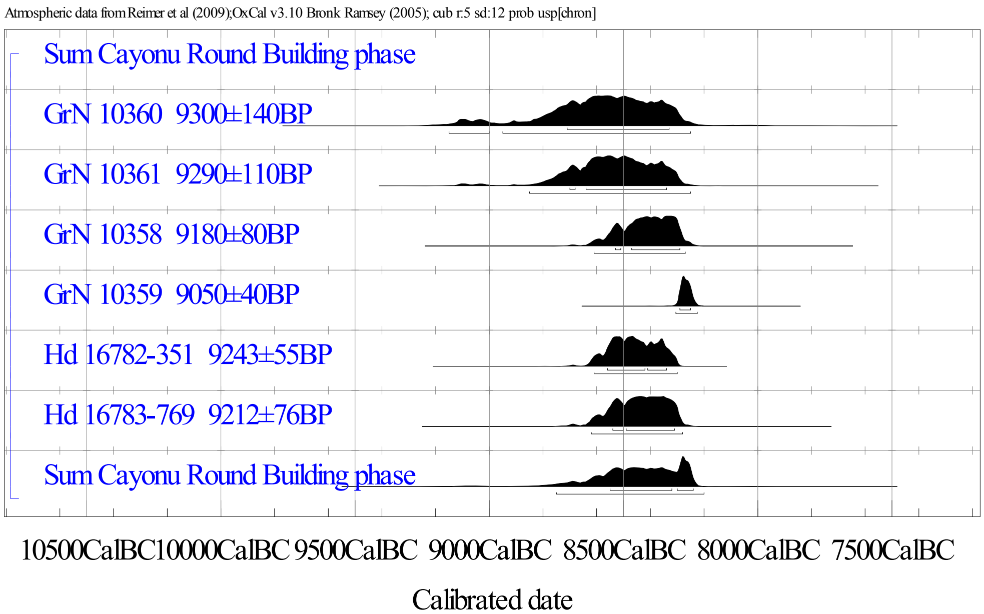
Source: PPND – The Platform for Neolithic Radiocarbon Dates.

Çayönü

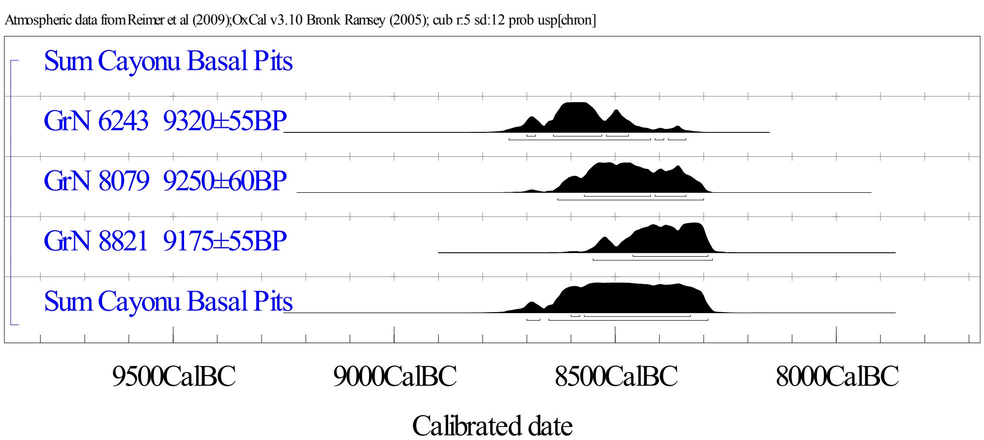
Base Level (10,570-10,190 cal BC)



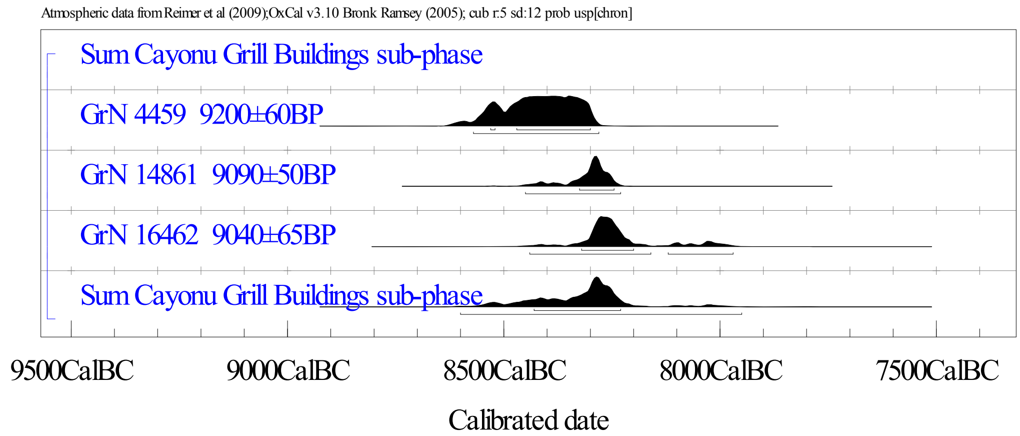
Round Building (8550-8240 cal BC)



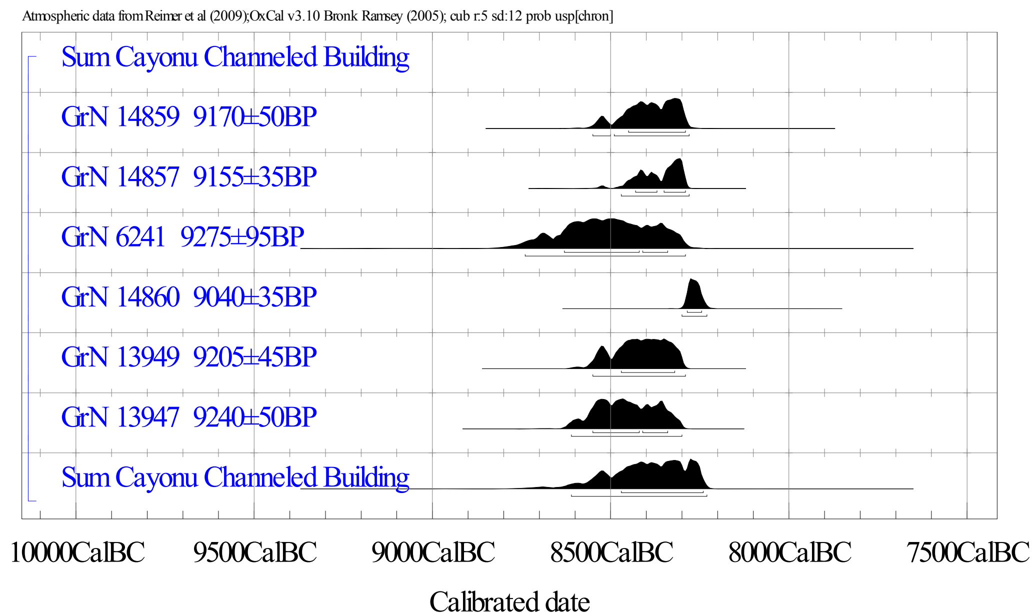
Basal Pits (8600-8330 cal BC)



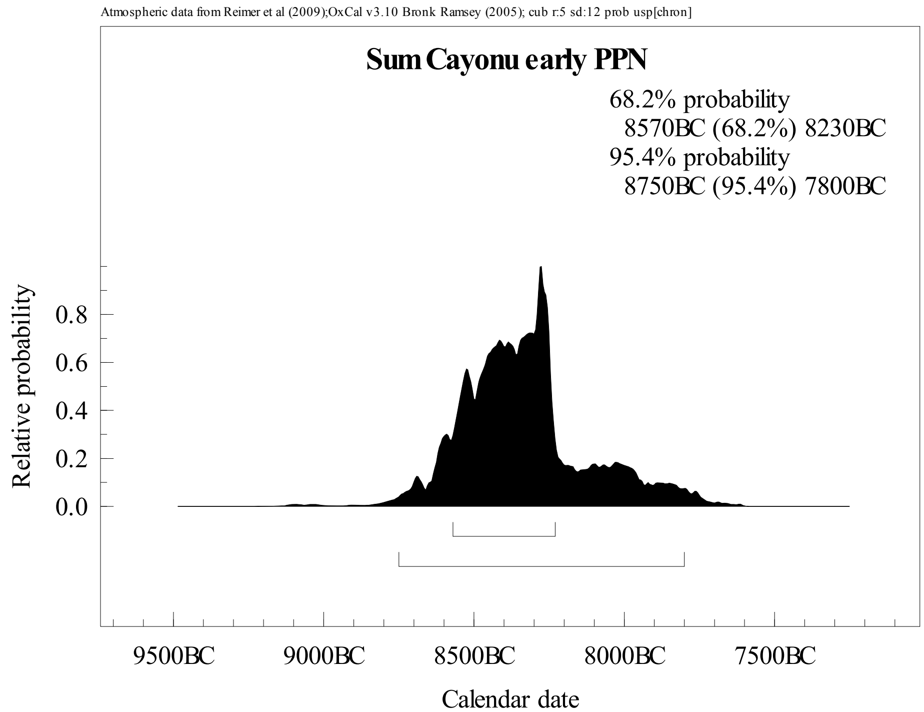
Grill Buildings (8430-8230 cal BC)



Channeled Building (8470-8240 cal BC)

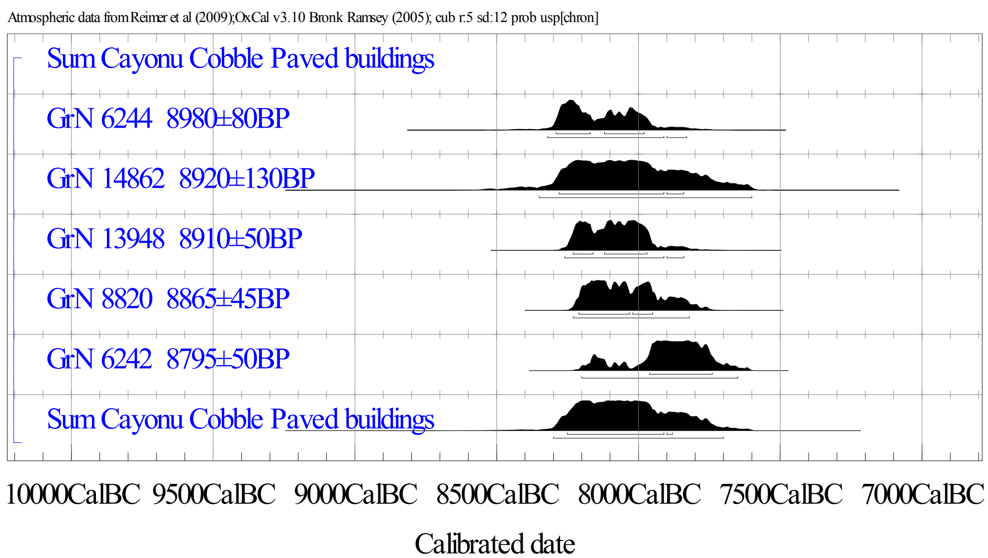


Çayönü has a long occupation through the PPN. The sum of 23 dates (excluding those with large standard deviations and the Basal level date, which is too early) produces a strong modal peak at ca. 8300 BC, as seen in the plot below, which is taken as the date for the early PPN finds of einkorn, emmer and pea at the site.

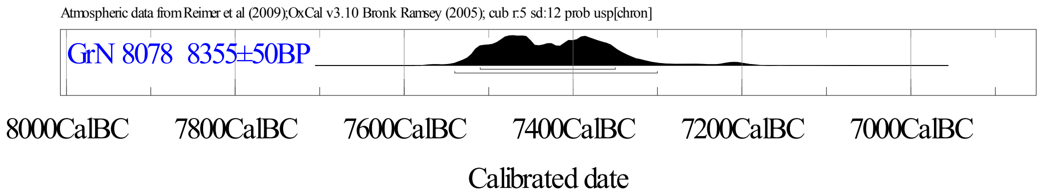


The transition to the late PPN is represented by the Cobble-Paved and the Cell Buildings sub-phase.

Cobble-Paved buildings (8250-7880 BC)

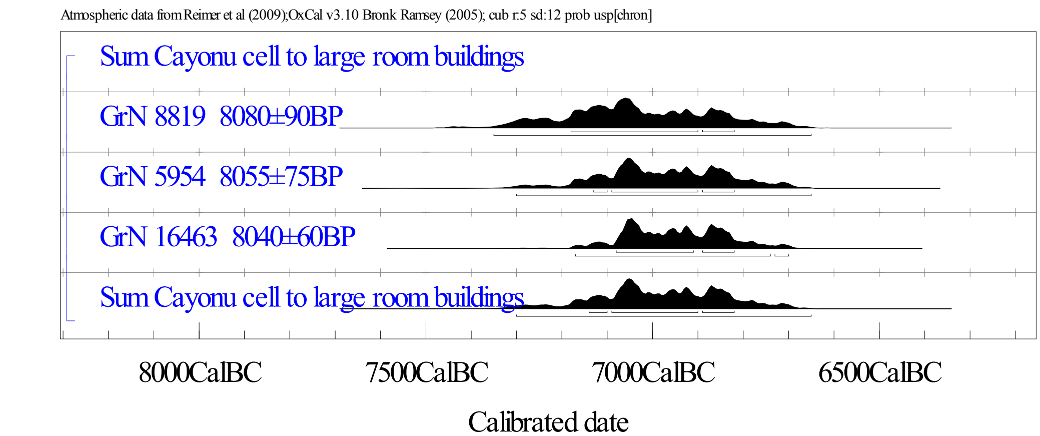


Cell Building sub-phase (7510-7350 cal BC)



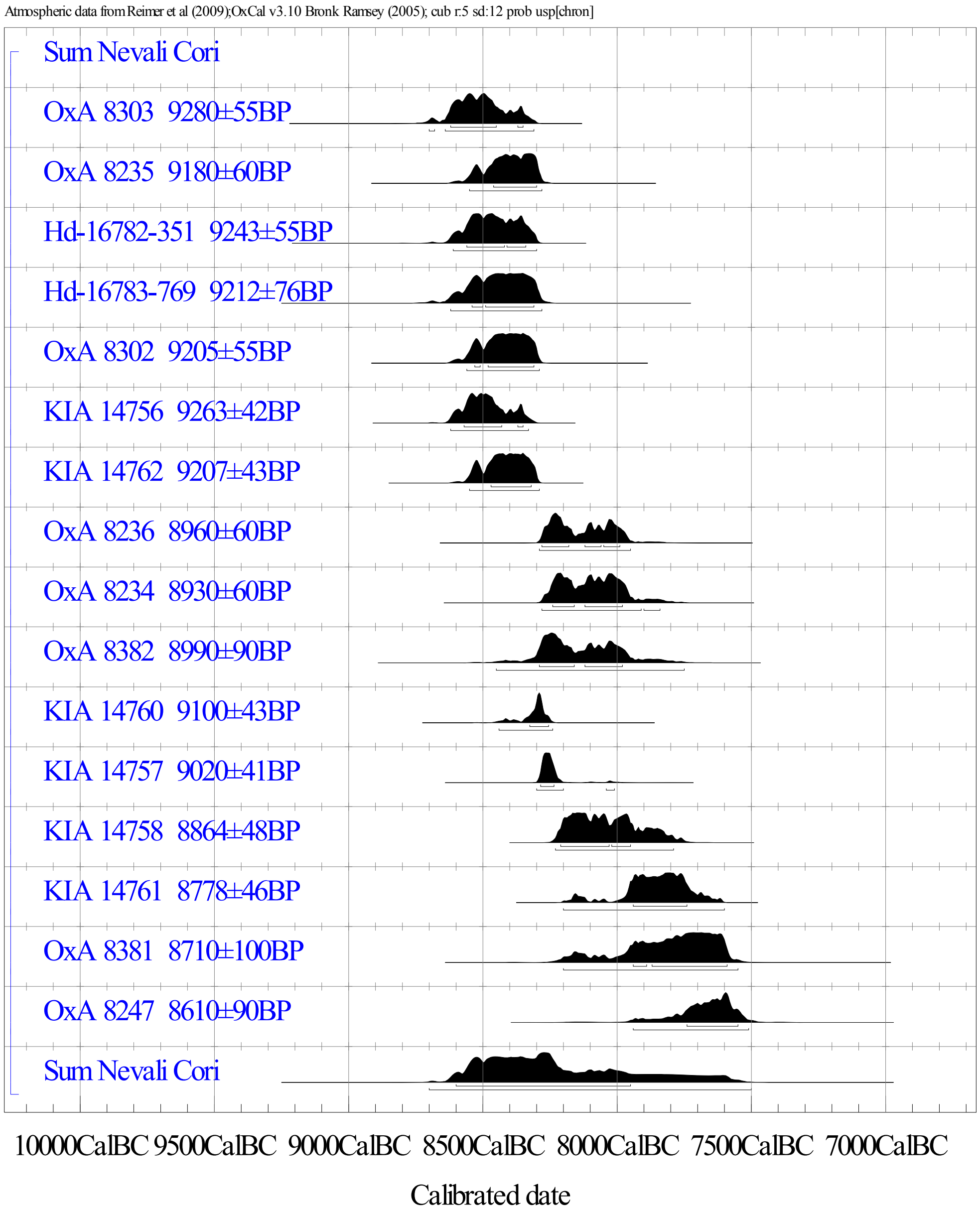
The latest early Neolithic phase is represented by the transition between the Cell and Large Room buildings.

Cell to Large Room transition (7140-6820 cal BC)



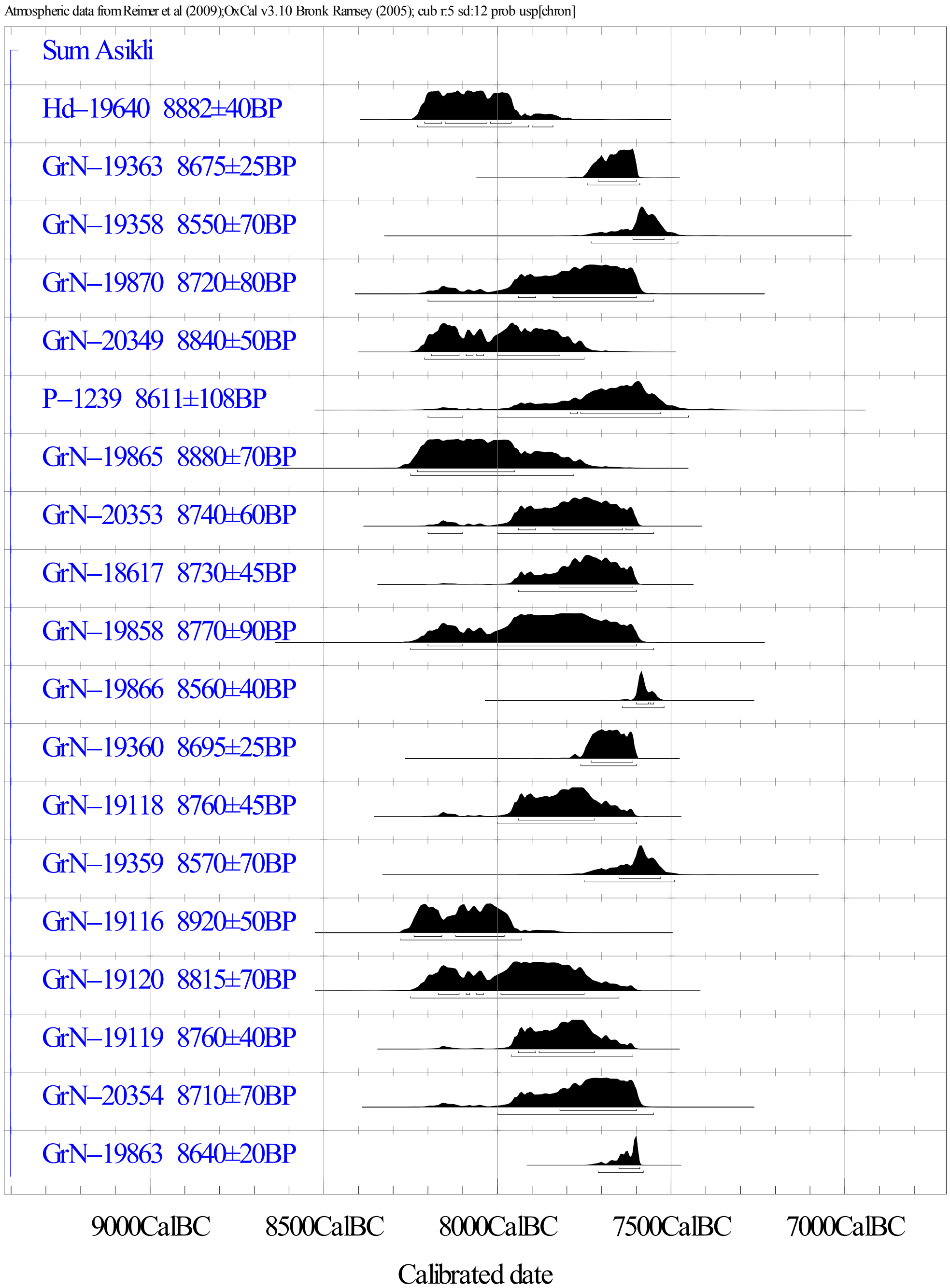
Source: Radiocarbon CONTEXT database; PPND – The Platform for Neolithic Radiocarbon Dates.

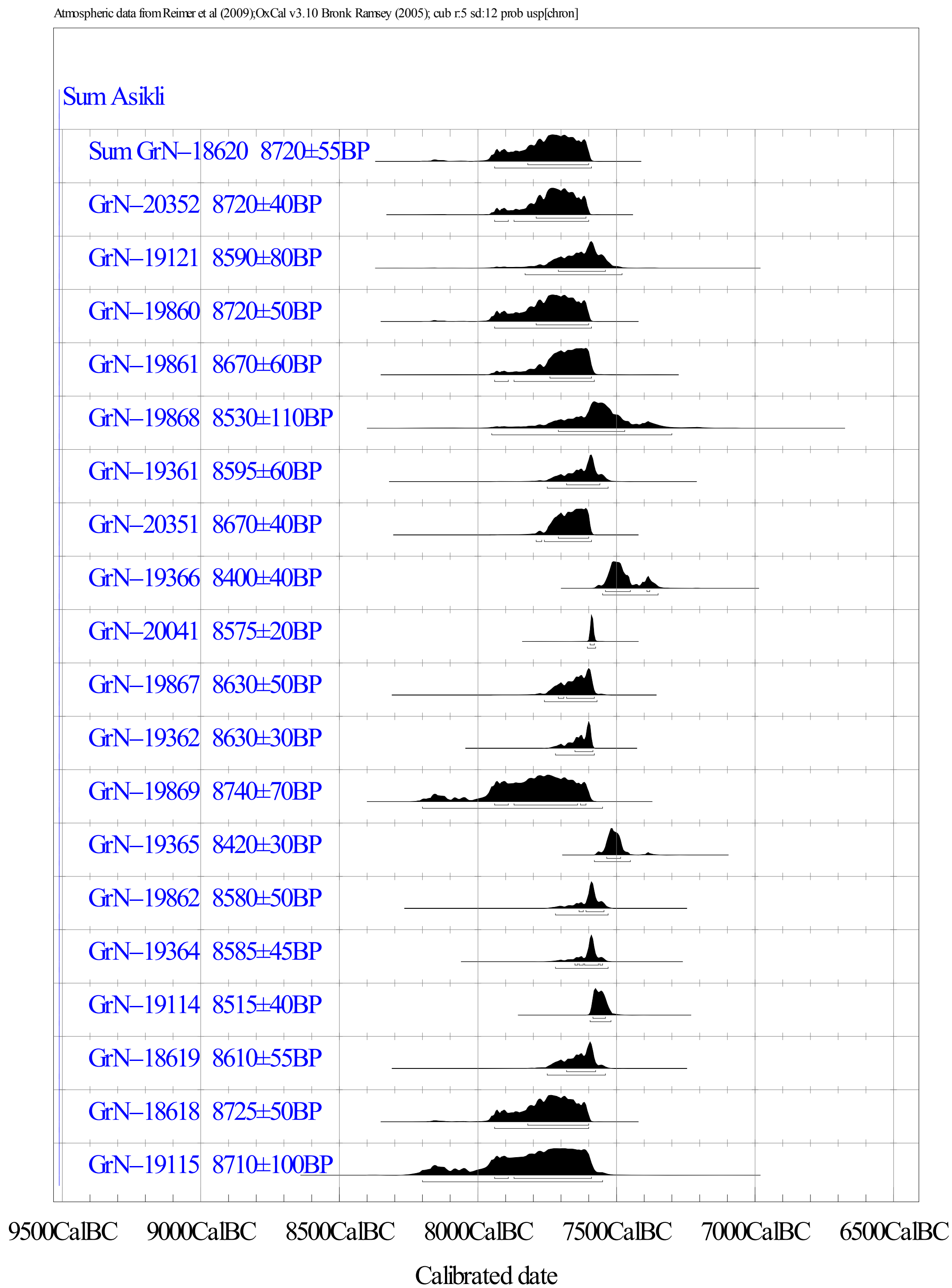
Nevalı Çori: 8600-7950 cal BC



Source: PPND – The Platform for Neolithic Radiocarbon Dates.

Aşıklı Höyük: 7820-7520 cal BC




Atmospheric data from Reimer et al (2009);OxCal v3.10 Bronk Ramsey (2005); cub r:5 sd:12 prob usp[chron]
Sum Asikli
Sum GrN–18620 8720±55BP
GrN–20352 8720±40BP
GrN–19121 8590±80BP
GrN–19860 8720±50BP
GrN–19861 8670±60BP
GrN–19868 8530±110BP
GrN–19361 8595±60BP
GrN–20351 8670±40BP
GrN–19366 8400±40BP
GrN–20041 8575±20BP
GrN–19867 8630±50BP
GrN–19362 8630±30BP
GrN–19869 8740±70BP
GrN–19365 8420±30BP
GrN–19862 8580±50BP
GrN–19364 8585±45BP
GrN–19114 8515±40BP
GrN–18619 8610±55BP
GrN–18618 8725±50BP
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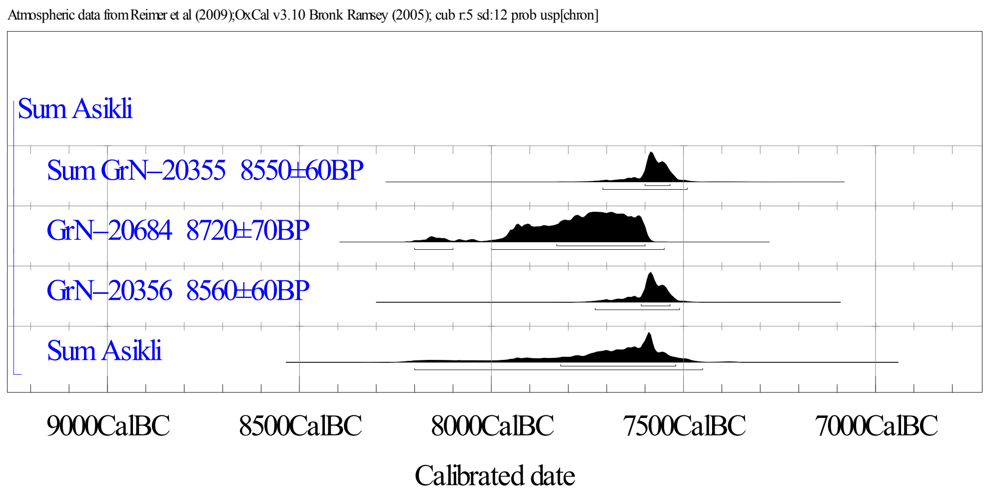
7500CalBC
7000CalBC
6500CalBC
Calibrated date



At Aşıklı Höyük the majority of dates have derived from Level 2, which was also the focus of the archaeobotanical analyses published to date.

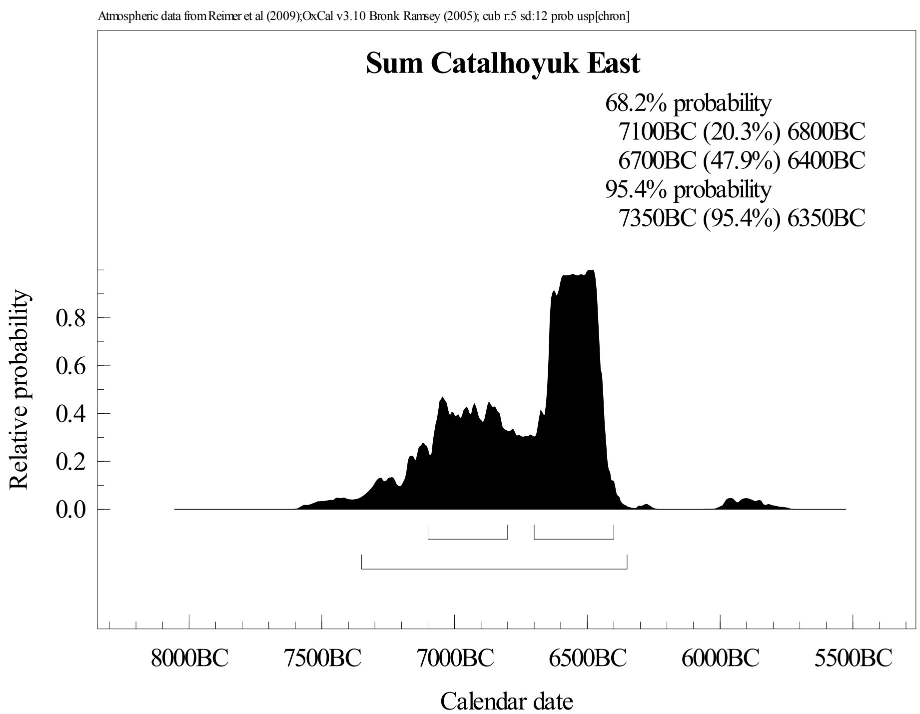
Source: Radiocarbon CONTEXT database

Hacılar: 8200-7550 cal BC (aceramic level)
A single date from Level IA (BM-127 8700 ± 180) has produced a calibrated age range of 8200-7550 cal BC at 1-sigma.

Source: Radiocarbon CONTEXT database.

Çatalhöyük East: 7100-6400 cal. BC

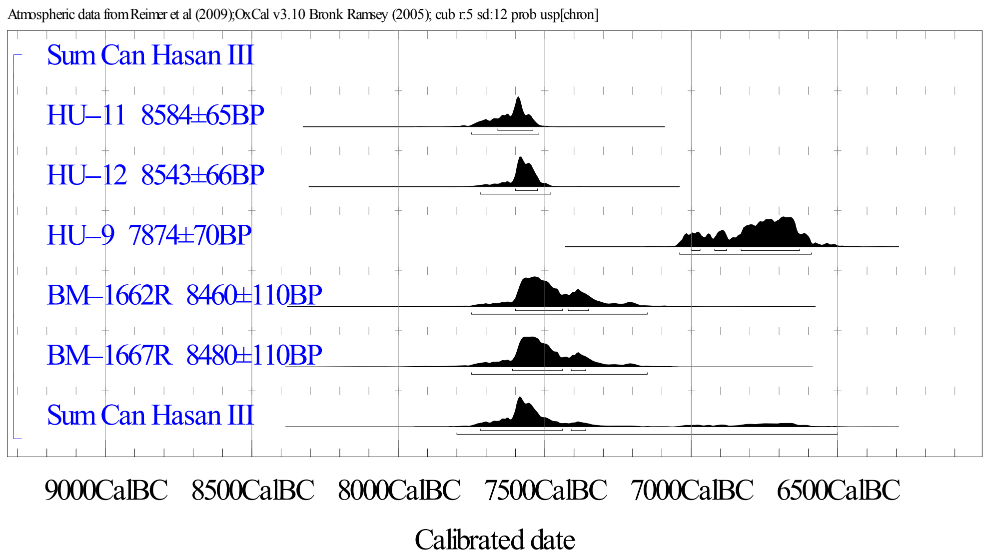
The summed 1-sigma probability of 65 dates (excluding those with large standard deviations) provided an extended modal range of 7100-6400 BC. Although more dates have recently become available (Bronk Ramsey et al. 2009) they have not been added here as upon preliminary inspection they did not alter the picture provided by the dates already available. The earliest (aceramic) levels of the mound have produced very few reliable dates by comparison to the ceramic Neolithic phases.



Source: Radiocarbon CONTEXT database.

Additional reference: Bronk Ramsey, C., T. F. G. Higham, F. Brock, D. Baker, and P. Ditchfield. 2009. Radiocarbon dates from the Oxford AMS systems: Archaeometry datelist 33. *Archaeometry* 51:323–349.

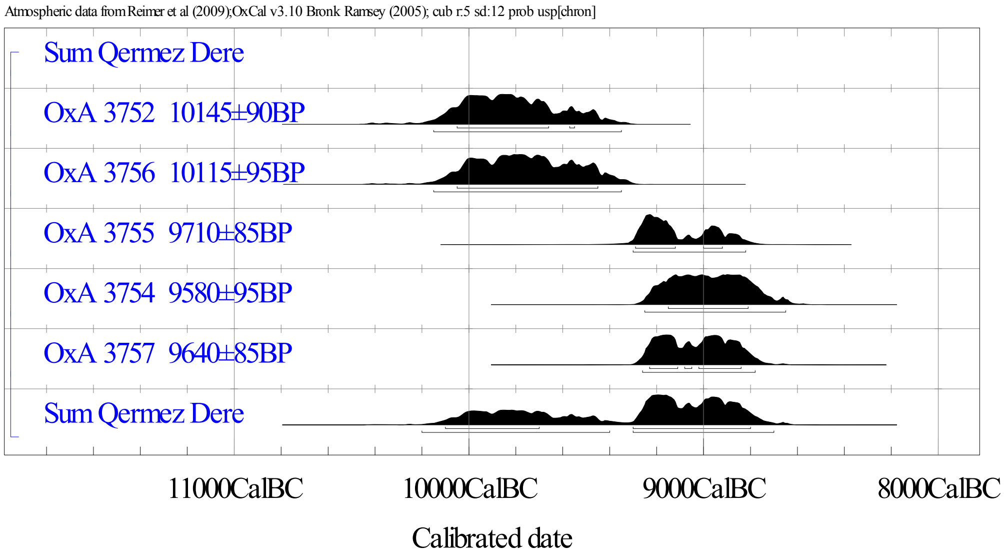
Can Hasan III: 7720-7360 cal BC



Source: Radiocarbon CONTEXT database.

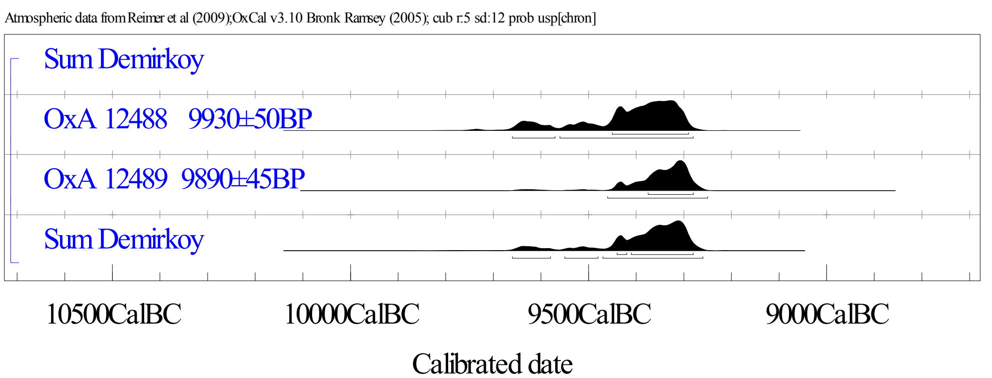
Eastern Fertile Crescent (Turkey, Iran, Iraq)

Qermez Dere: 10,100-9700; 9300-8800 cal BC



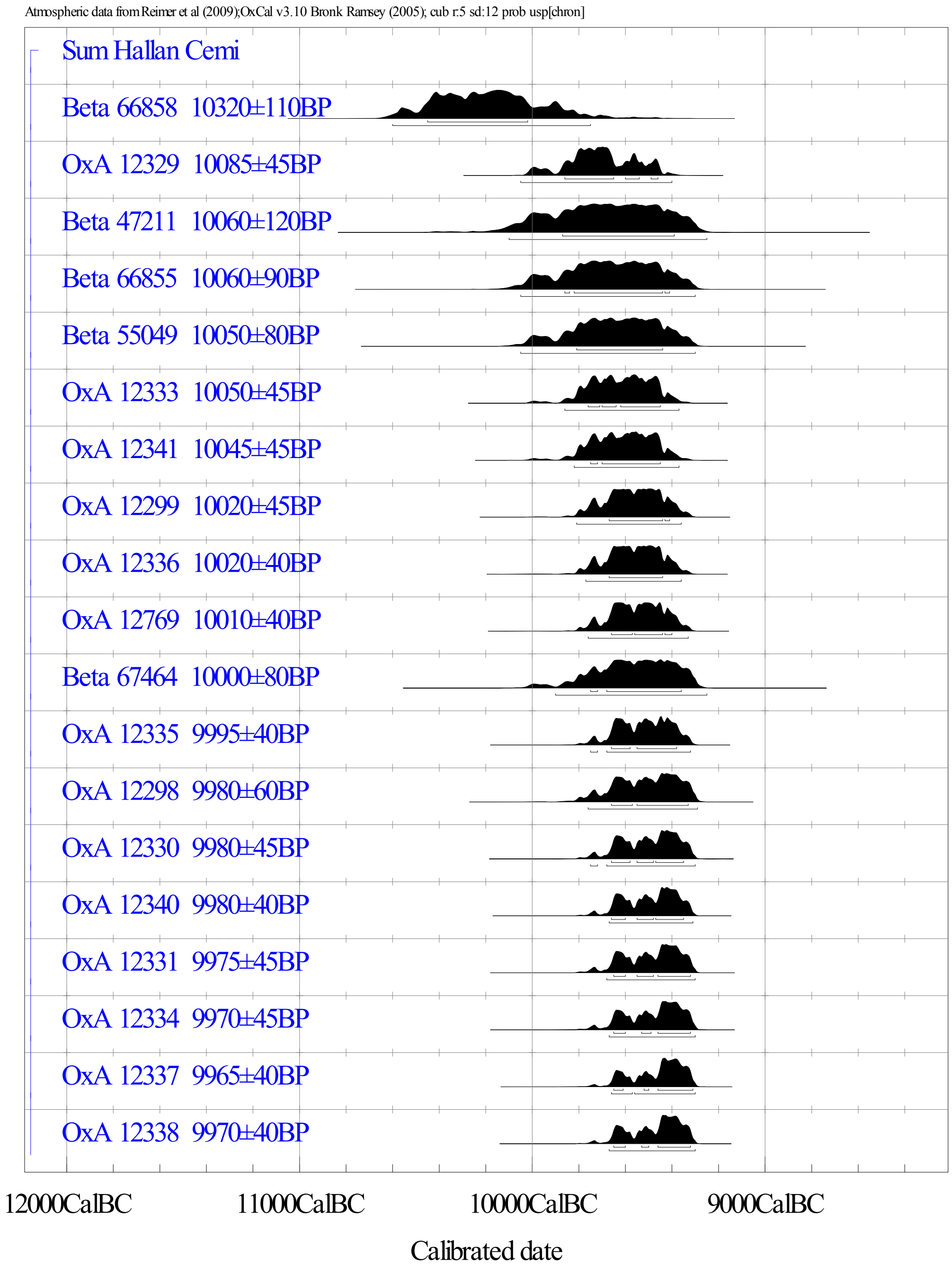
Source: Radiocarbon CONTEXT database.

Demirköy: 9440-9280 cal BC

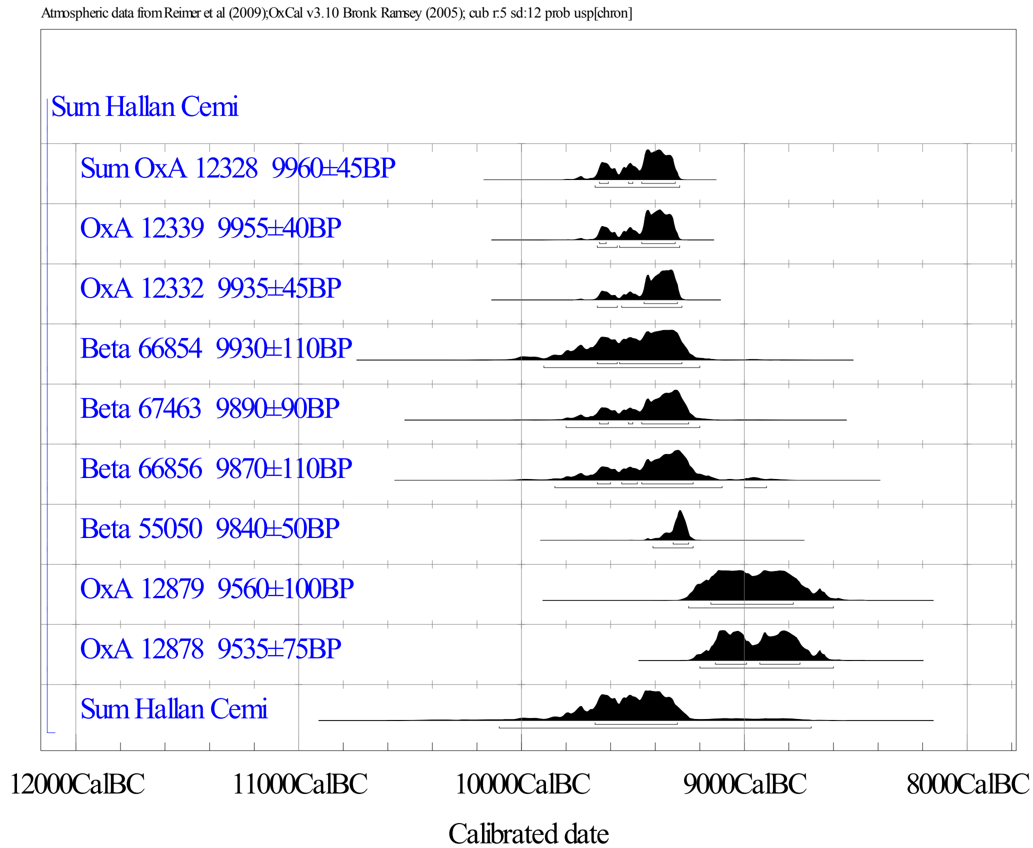


Source: Rosenberg, M., and B. L. Peasnall. 1998. A report on soundings at Demirköy Höyük: an aceramic Neolithic site in Eastern Anatolia. *Anatolica* 24:195–201.

Hallan Çemi: 9670-9300 cal BC (early PPN phase)

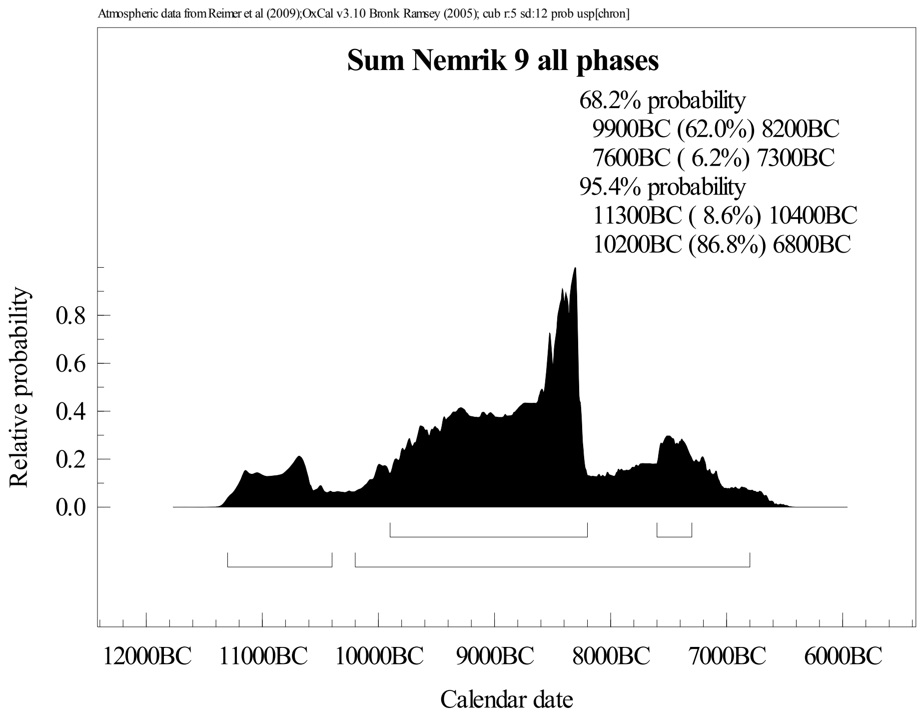


Source: Radiocarbon CONTEXT database.



Source: Radiocarbon CONTEXT database.

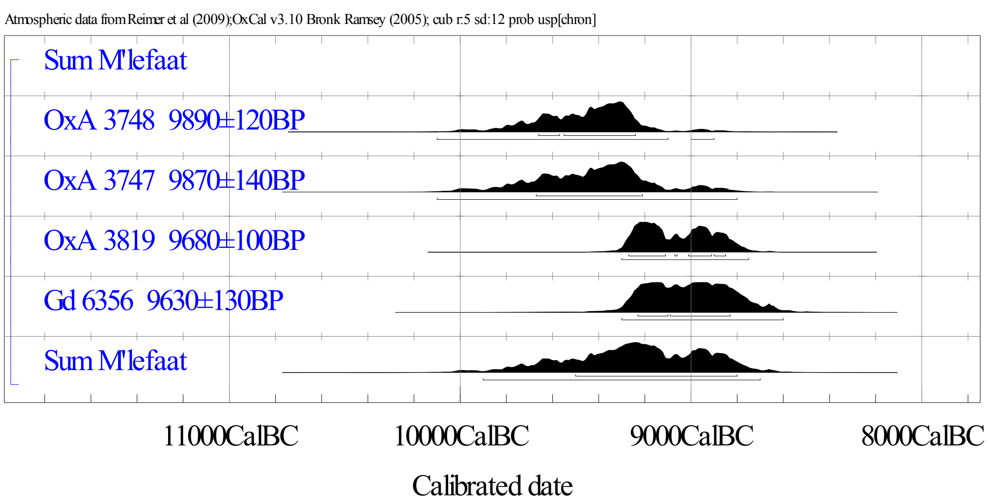
Nemrik 9: c. 9900-8200 cal BC (early PPN phase)



A reliable separation of different habitation periods at Nemrik 9 is not feasible due to the significant chronological overlap observed between the different phases of the site (Phases 2-4) each of which appears to date from the 10th-8th millennia cal BC.

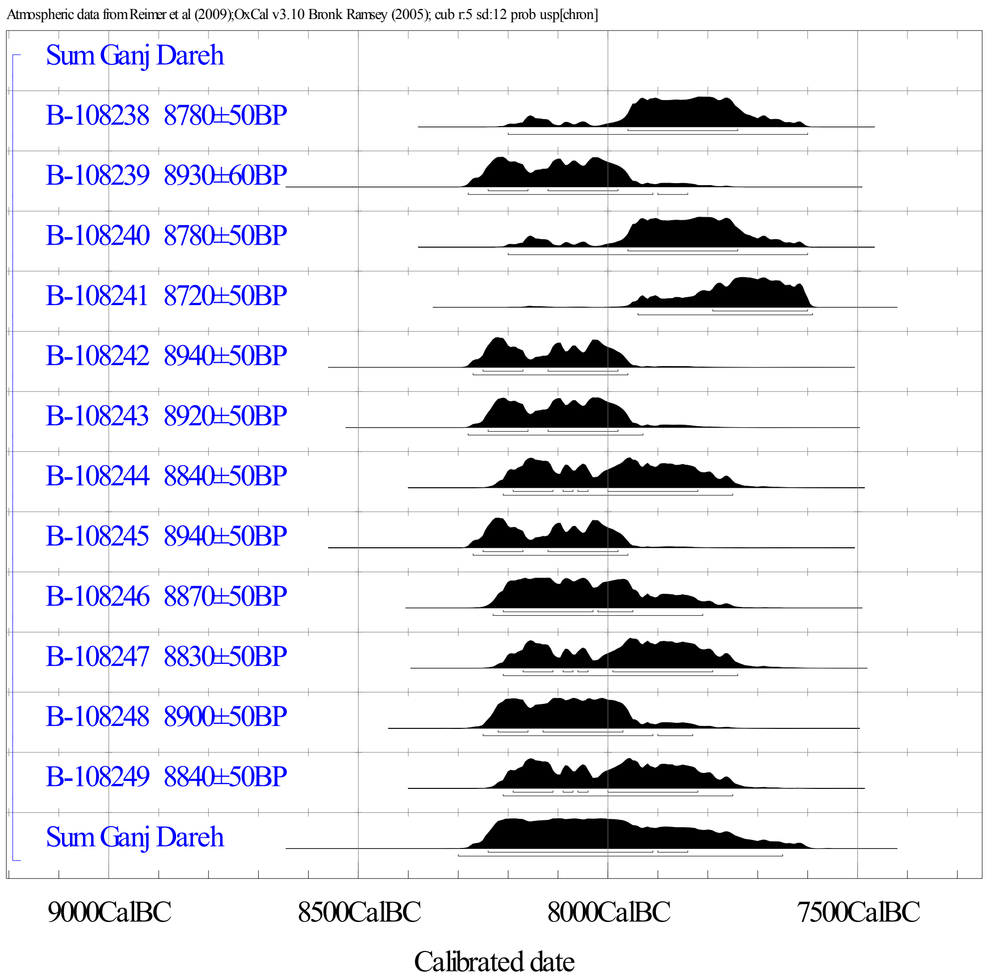
Source: Radiocarbon CONTEXT database.

M'lefaat: 9500-8800 cal BC



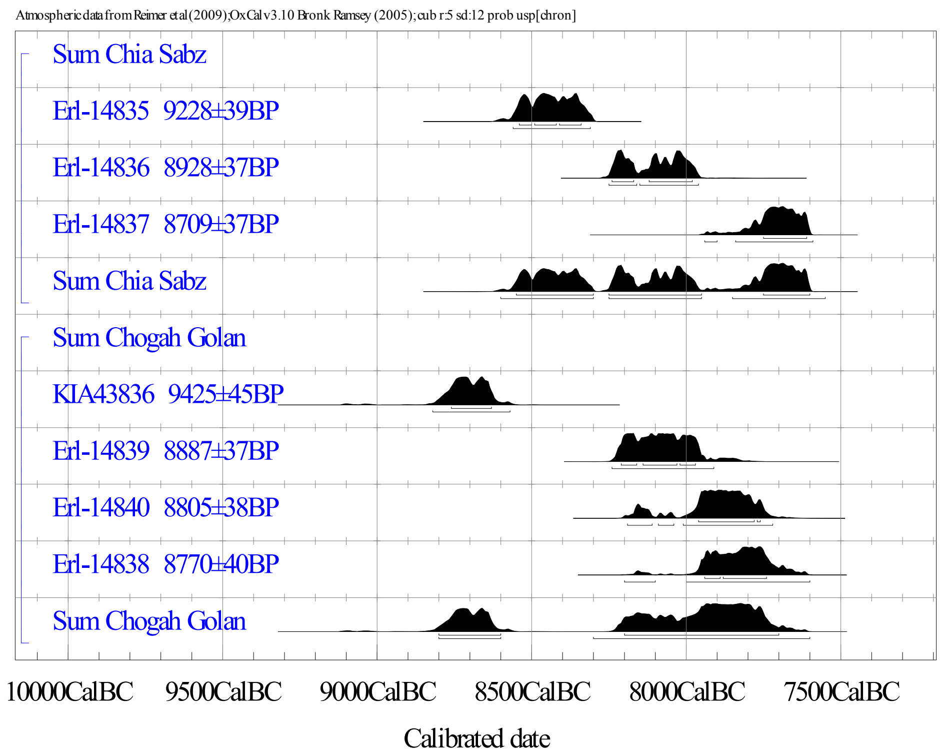
Source: Radiocarbon CONTEXT database.

Ganj Dareh: 8240-7840 cal BC



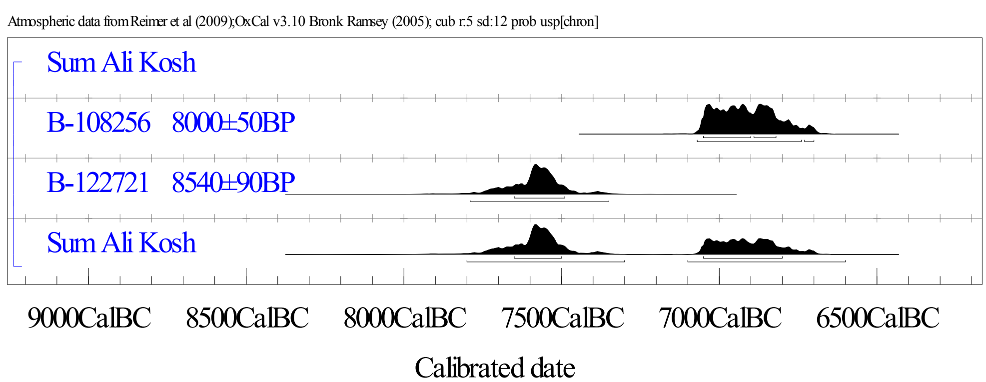
Source: Zeder, M., and B. Hesse. 2000. The initial domestication of goats (*Capra hircus*) in the Zagros Mountains 10,000 years ago. *Science* 287:2254–2257.

Chia Sabz: 8550-7600 BC; **Chogha Golan:** 8700-7700 BC



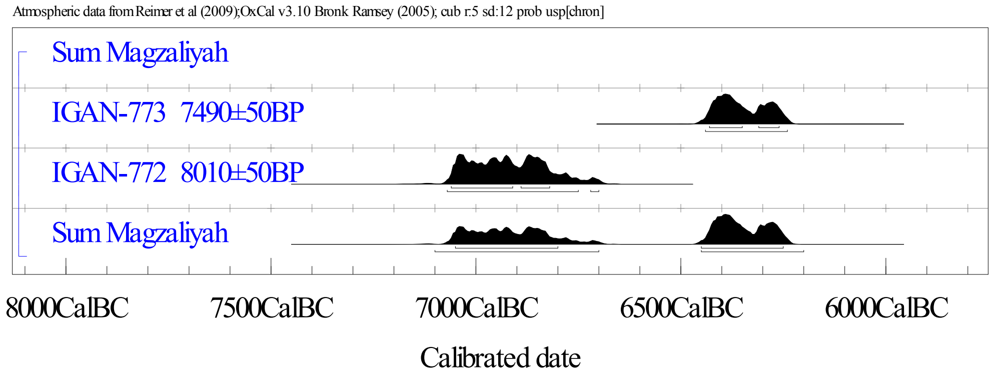
Source: Riehl, S., M. Benz, N. J. Conard, H. Darabi, K. Deckers, H. F. Nashli, and M. Zeidi-Kulehparchec. 2011. Plant use in three Pre-Pottery Neolithic sites of the northern and eastern Fertile Crescent: a preliminary report. *Vegetation History and Archaeobotany*. [DOI: 10.1007/s00334-011-0318-y].

Ali Kosh (Bus Mordeh phase): 7650-6800 cal BC



Source: Radiocarbon CONTEXT database.

Tell Magzaliyah: 7050-6250 cal BC



Source: Radiocarbon CONTEXT database.

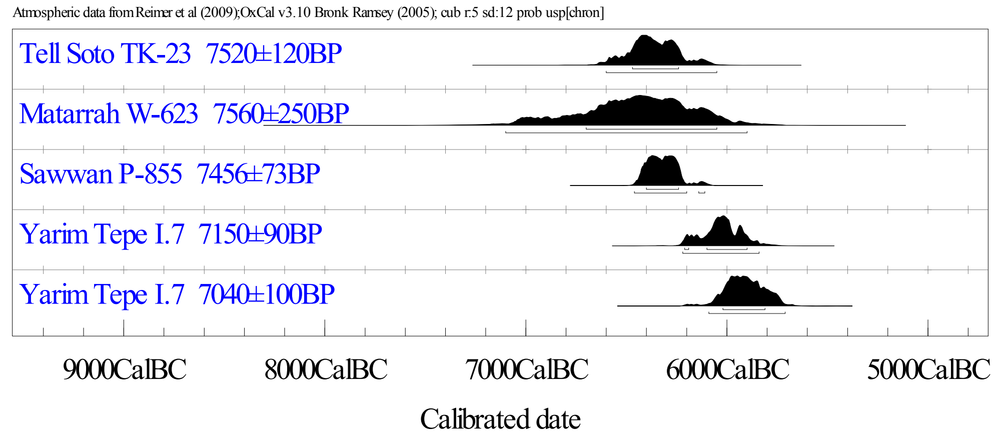
Tepe Abdul Hosein, Jarmo, Chogha Bonut, Umm Dabaghiyah

We have used the calibrated equivalents of the estimated date ranges listed in Charles (2007).

Source: Charles, M. 2007. East of Eden? A consideration of Neolithic crop spectra in the eastern Fertile Crescent and beyond. In *The Origins and Spread of Domestic Plants in Southwest Asia and Europe*. S. Colledge, and J. Conolly, eds. Pp. 37–52. Walnut Creek: Left Coast.

Yarim Tepe I: c. 6800-6000 cal BC.

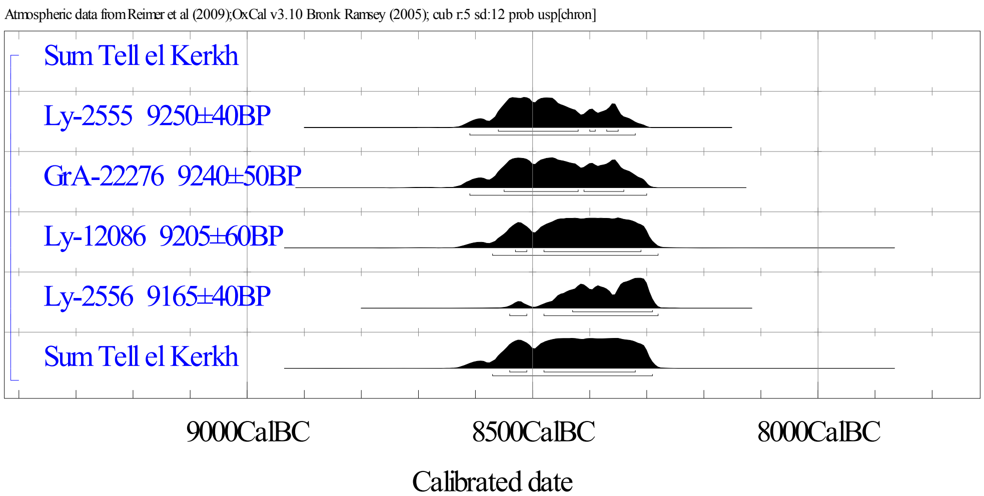
This early Pottery Neolithic site has been dated on the basis of two radiocarbon dates derived from the upper levels of its earliest phase, and by correlation with other sites such as Sawwan, Matarrah and Telul eth-Thalathat (Tell Soto culture) which are believed to correspond to its earliest known levels (Merpert and Muchaev 1987). On the basis of the dates from these sites a median date of ca. 6100 BC has been tentatively assigned to Yarim Tepe I.



Source: Merpert, N. Y., Munchaev, R. M. 1987. The earliest levels at Yarim Tepe I and Yarim Tepe II in Northern Iraq. *Iraq* 49:1–36.

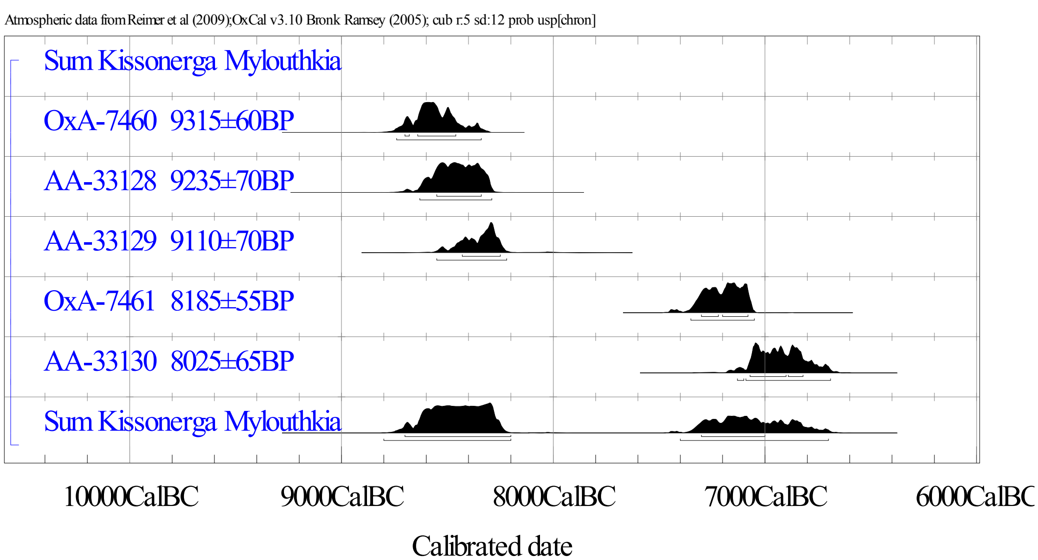
Western Syria and Cyprus

Tell el-Kerkh: 8540-8320 cal BC



Source: Tanno, K.-I., and G. Willcox. 2006. The origins of *Cicer arietinum* L. and *Vicia faba* L.: early finds from Tell el-Kerkh, north-west Syria, late 10th millennium B.P. *Vegetation History and Archaeobotany* 15:197–204.

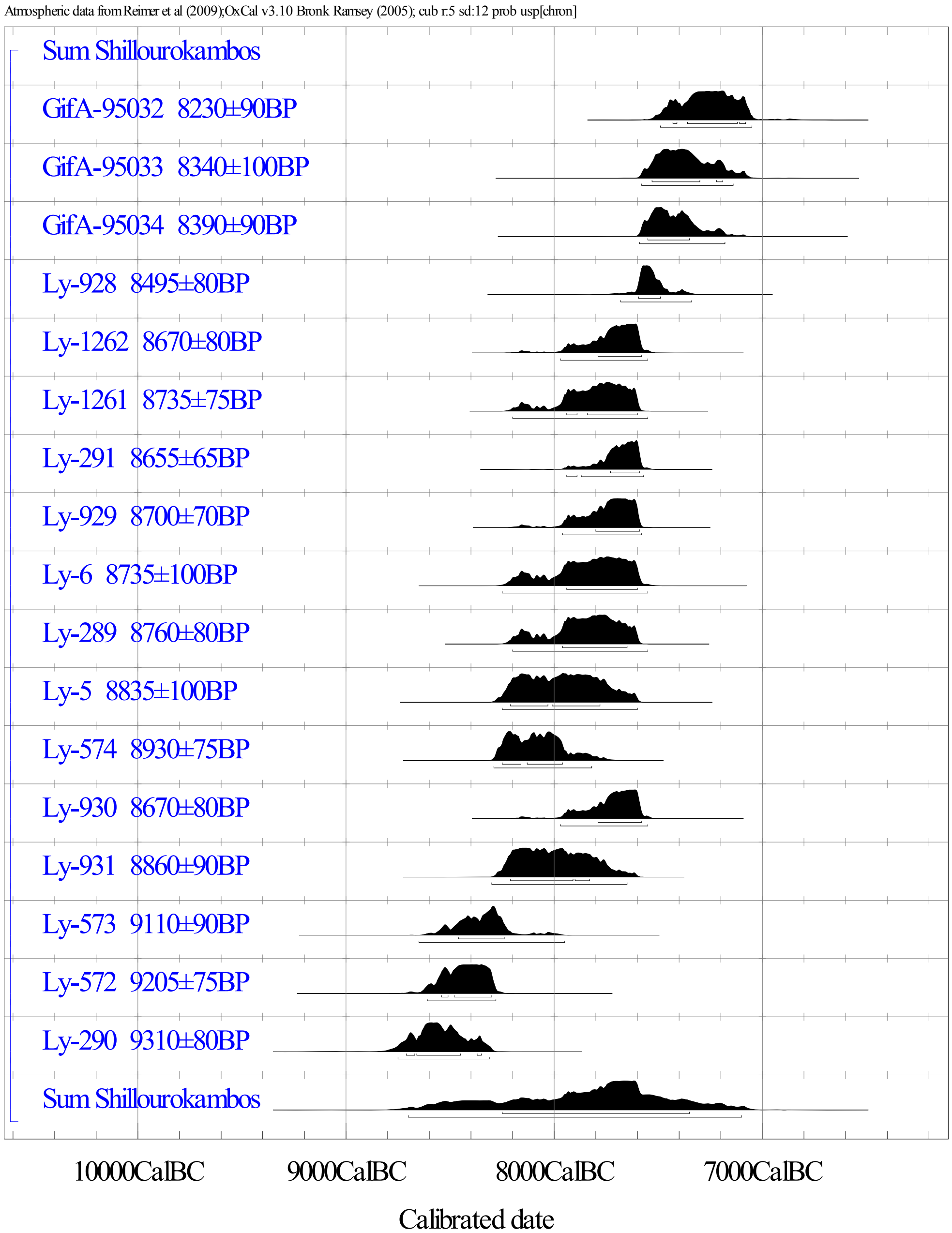
Kissonerga-Mylouthkia: 8700-7000 cal BC (8700-8200 cal BC early PPN phase).



We consider the early mode, which includes direct dates on grains, as representative of the main E-MPPNB (8700-8200 BC) crop evidence.

Source: Radiocarbon CONTEXT database.

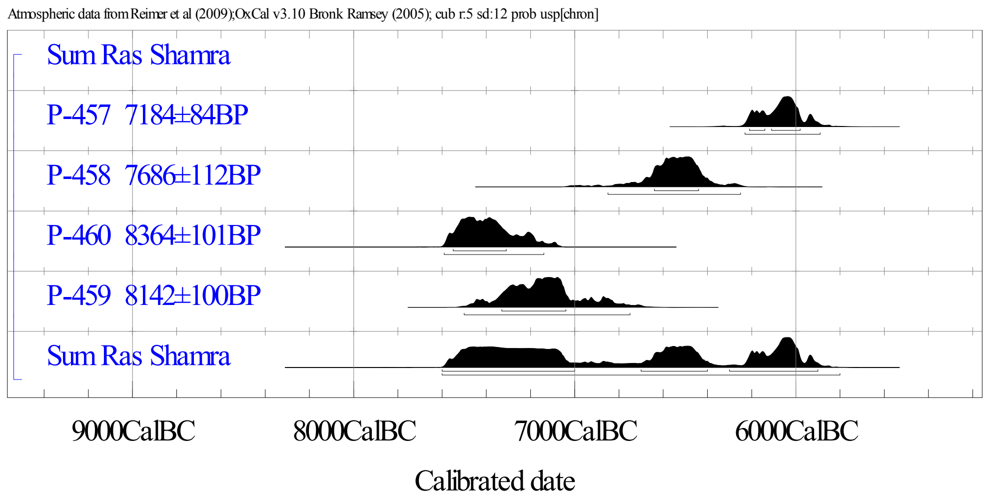
Shillourokambos: 8250-7350 cal. BC



Source: Radiocarbon CONTEXT database

Ras Shamra: 7600-7000 cal BC (early phase)

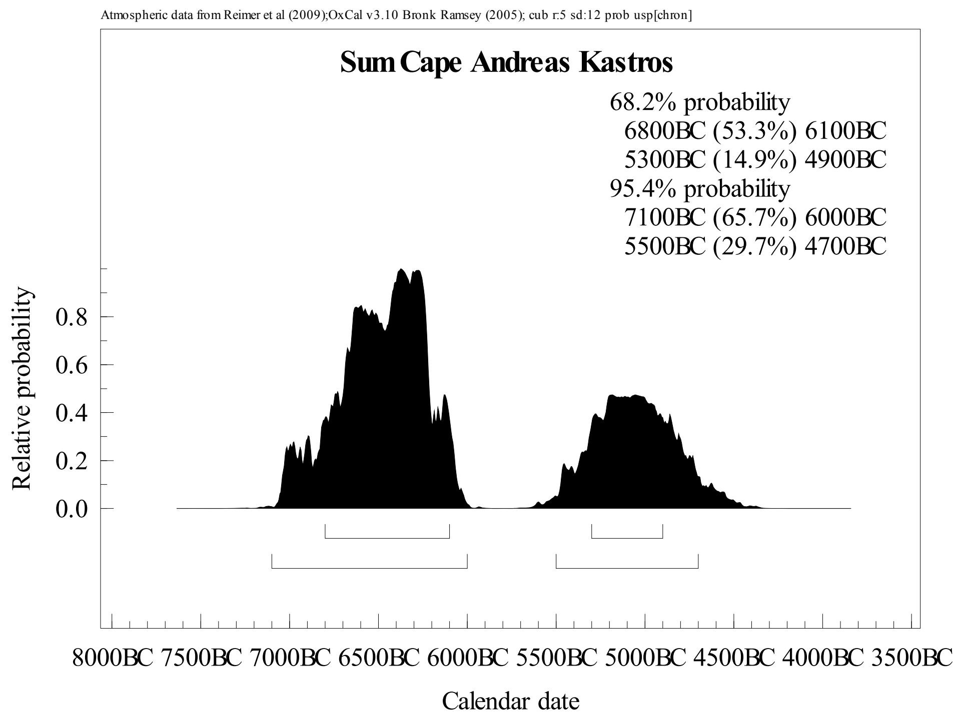
Ras Shamra has only 4 radiocarbon dates, with two from the LPPNB and two from the Pottery Neolithic. 7200 BC is the median date for the earlier phase, while 6300 BC is the median for the later phase.



Source: Colledge, S. 2001. *Plant exploitation on Epipalaeolithic and early Neolithic sites in the Levant.* British Archaeological Reports, International Series 986. Oxford: Archaeopress.

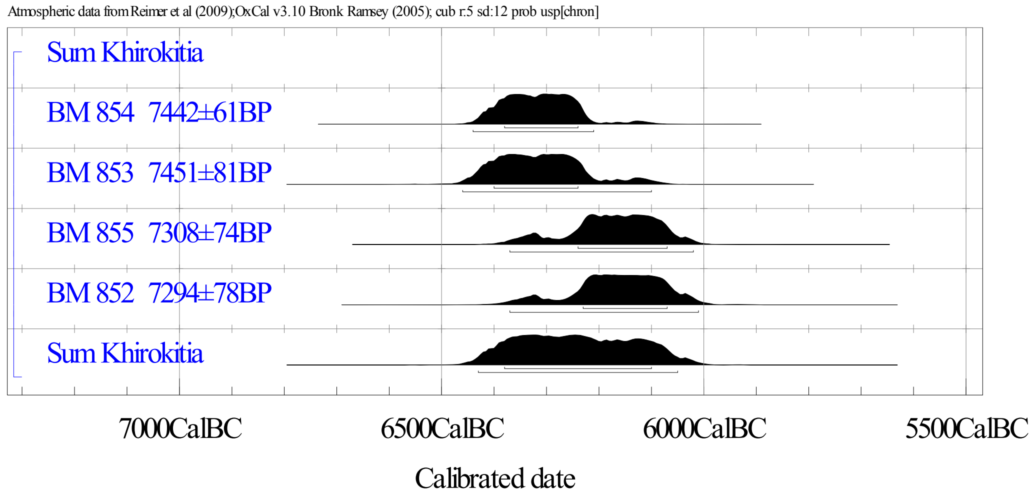
Cape Andreas-Kastros: 6800-6100 cal BC (early phase)

Only three radiocarbon dates are available from this site. One later date is an outlier. Given that this is an aceramic site, the mode of the two earlier dates, which are in line with the PPN of the mainland, have been considered for a median estimate of 6400 BC.



Source: Radiocarbon CONTEXT database.

Khirokitia: >6400-6100 cal BC



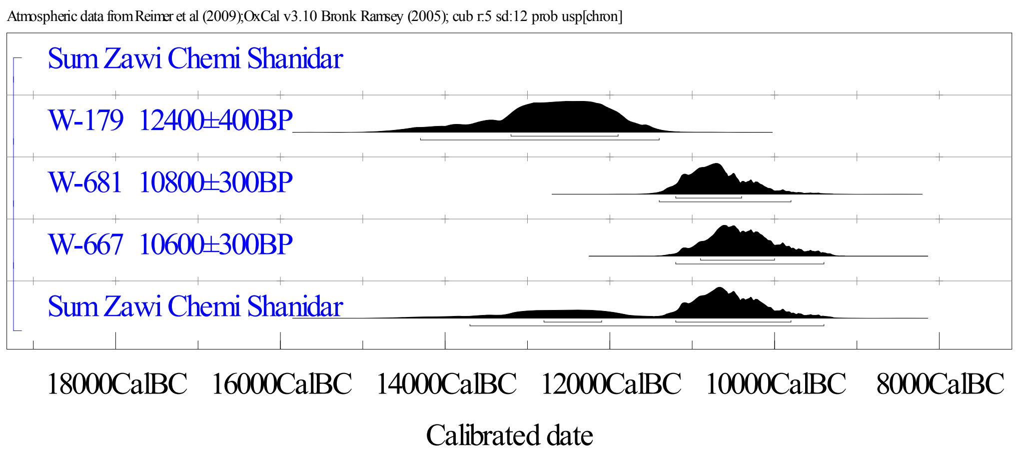
Khirokitia has produced very few reliable radiocarbon dates, none of which has derived from its earliest excavated levels.

Source: Radiocarbon CONTEXT database.

Part 3: Additional Radiocarbon Dates for Early PPN Sites in Southwest Asia

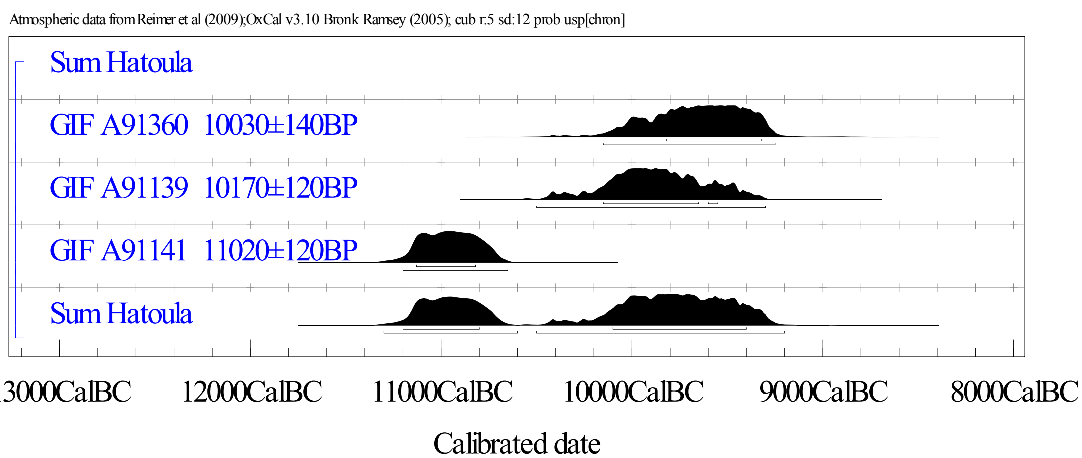
All calibrations were performed at 1-sigma probability, using the IntCal09 calibration curve (for references see Part 2). The sources of the radiocarbon dates are listed below individual sites.

Zawi Chemi Shanidar: 12,800-9800 cal BC



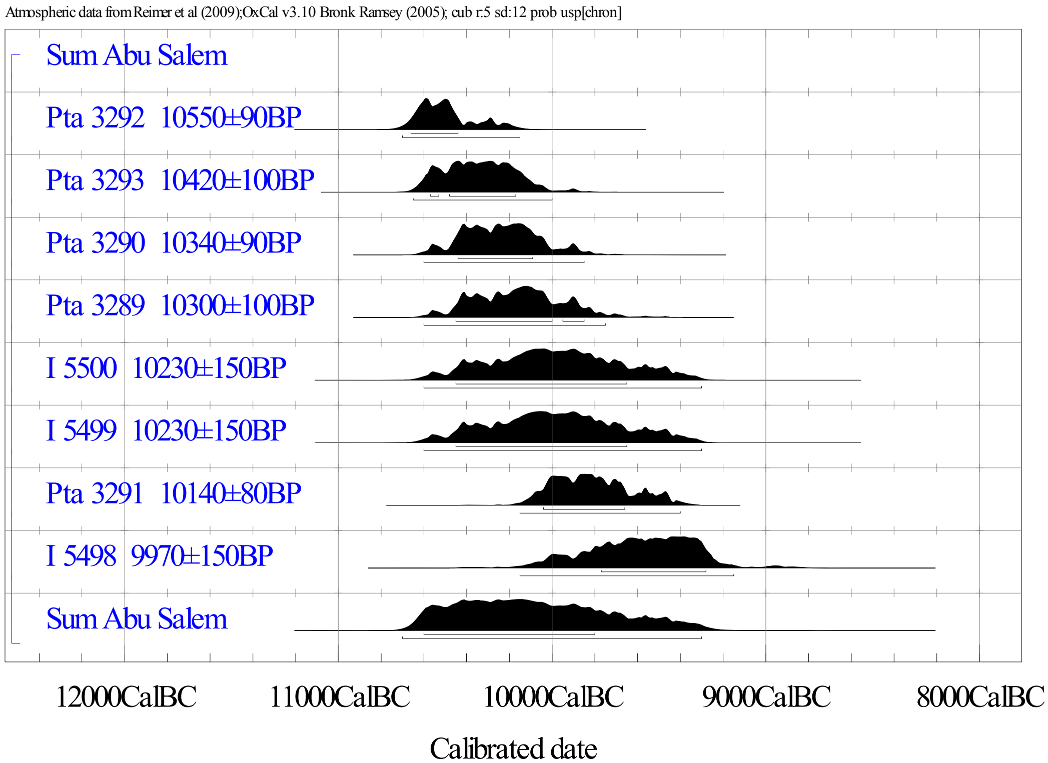
Source: Radiocarbon CONTEXT database.

Hatoula: 11,200-9400 cal BC



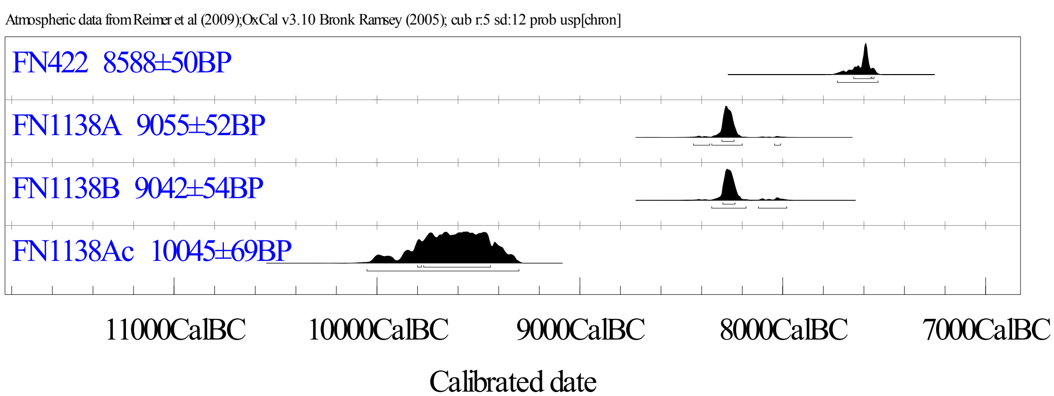
Source: PPND – The Platform for Neolithic Radiocarbon Dates.

Abu Salem: 10,600-9800 cal BC



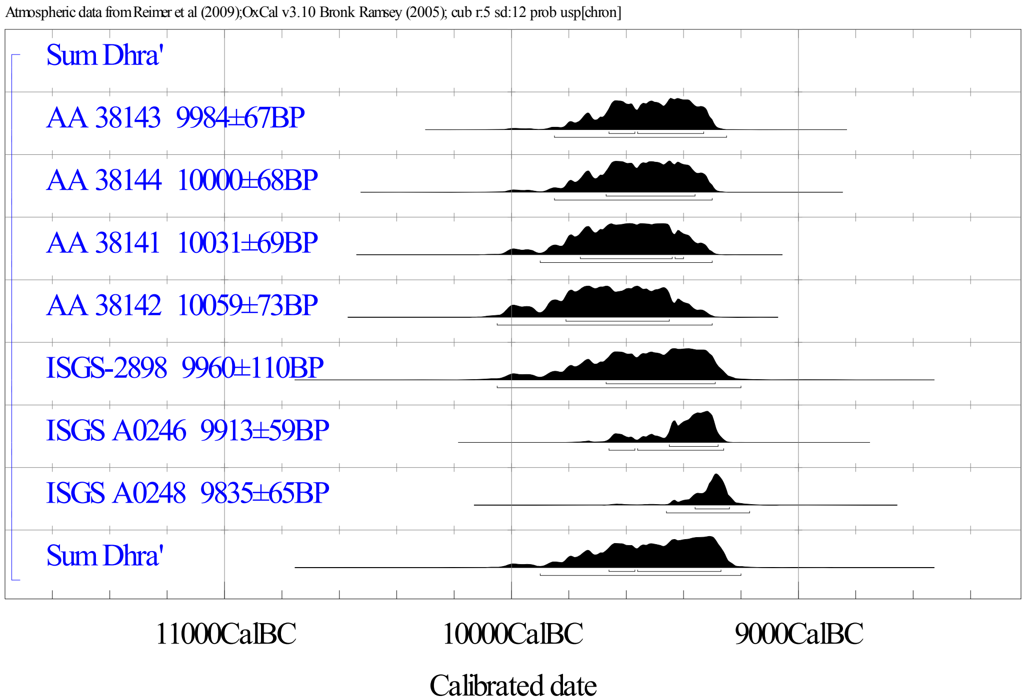
Source: PPND – The Platform for Neolithic Radiocarbon Dates.

Akrotiri Aetokremnos: 9800-9440 cal BC (earliest phase)



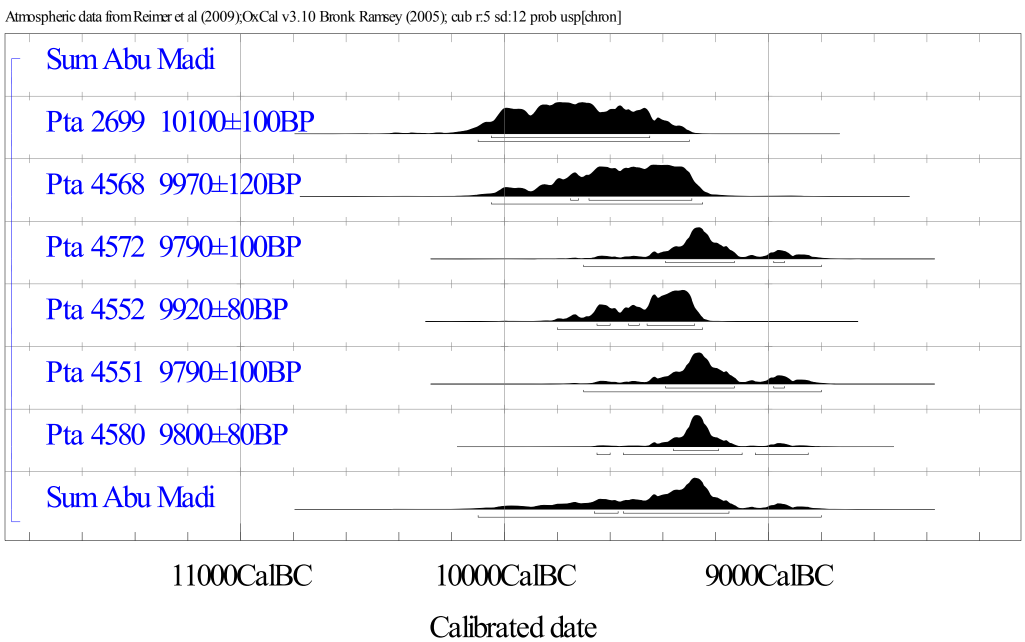
Source: Vigne, J.-D., A. Zazzo, J.-F. Saliège, F. Poplin, J. Guilaine, and A. Simmons. 2009. Pre-Neolithic wild boar management and introduction to Cyprus more than 11,400 years ago. *PNAS* 106(38):16135–16138.

Dhra‘: 9660-9270 cal BC



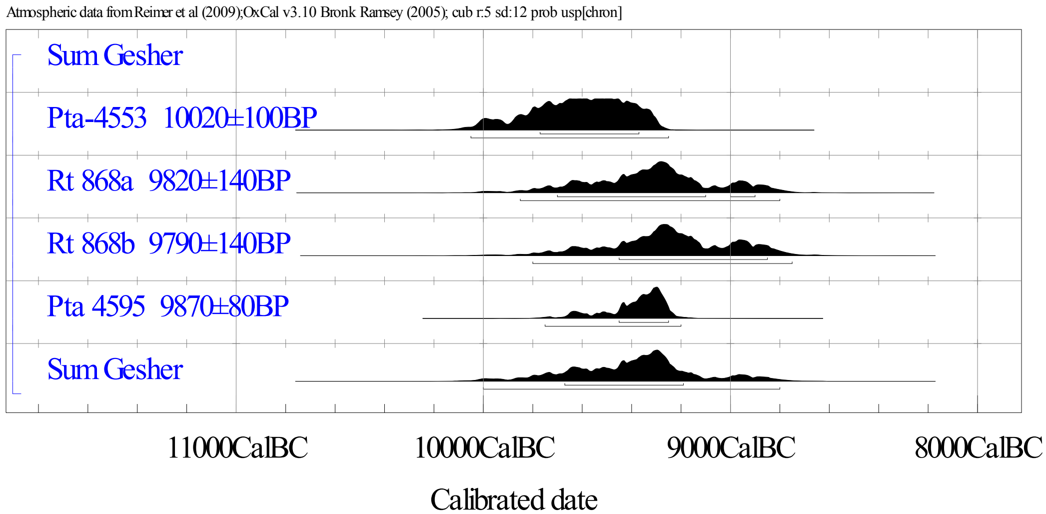
Source: Kuijt, I., and B. Finlayson. 2001. The 2001 excavation season at the Pre-Pottery Neolithic A period settlement of Dhra', Jordan: preliminary results. *Neo-Lithics* 2/01:12–15.

Abu Madi I: 9660-9150 cal BC



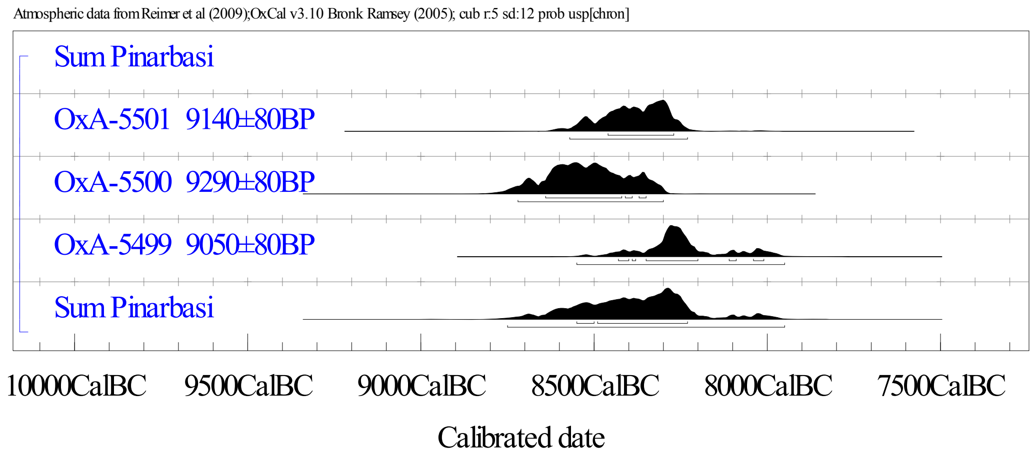
Source: PPND – The Platform for Neolithic Radiocarbon Dates.

Gesher: 9670-9190 cal BC



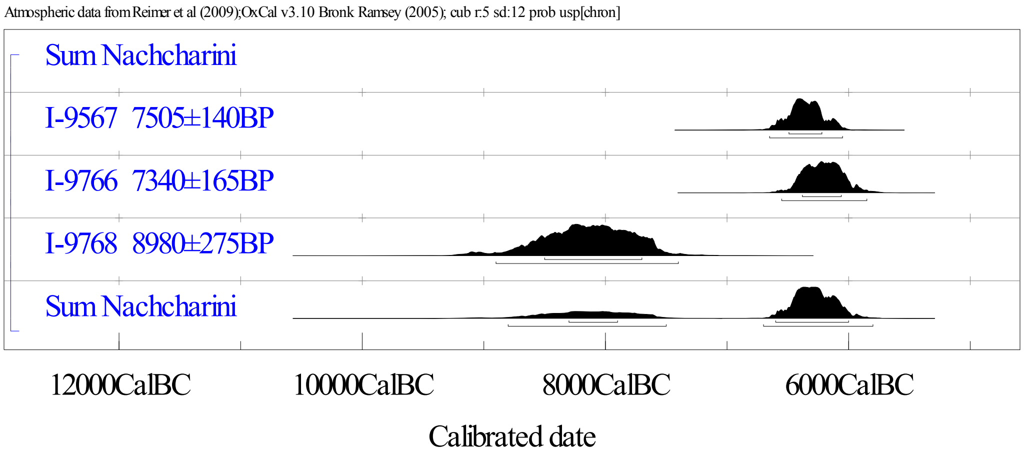
Source: PPND – The Platform for Neolithic Radiocarbon Dates.

Pınarbaşı: 8640-8240 cal BC



All dates are derived from excavations at Site A (aceramic Neolithic).
Source: Watkins, T. 1995. Excavations at Pınarbaşı: the early stages. In *On the Surface: Çatalhöyük 1993-95.* I. Hodder, ed. Pp. 47–58. Çatalhöyük Research Project 1. Cambridge: British Institute of Archaeology at Ankara & McDonald Institute for Archaeological Research.

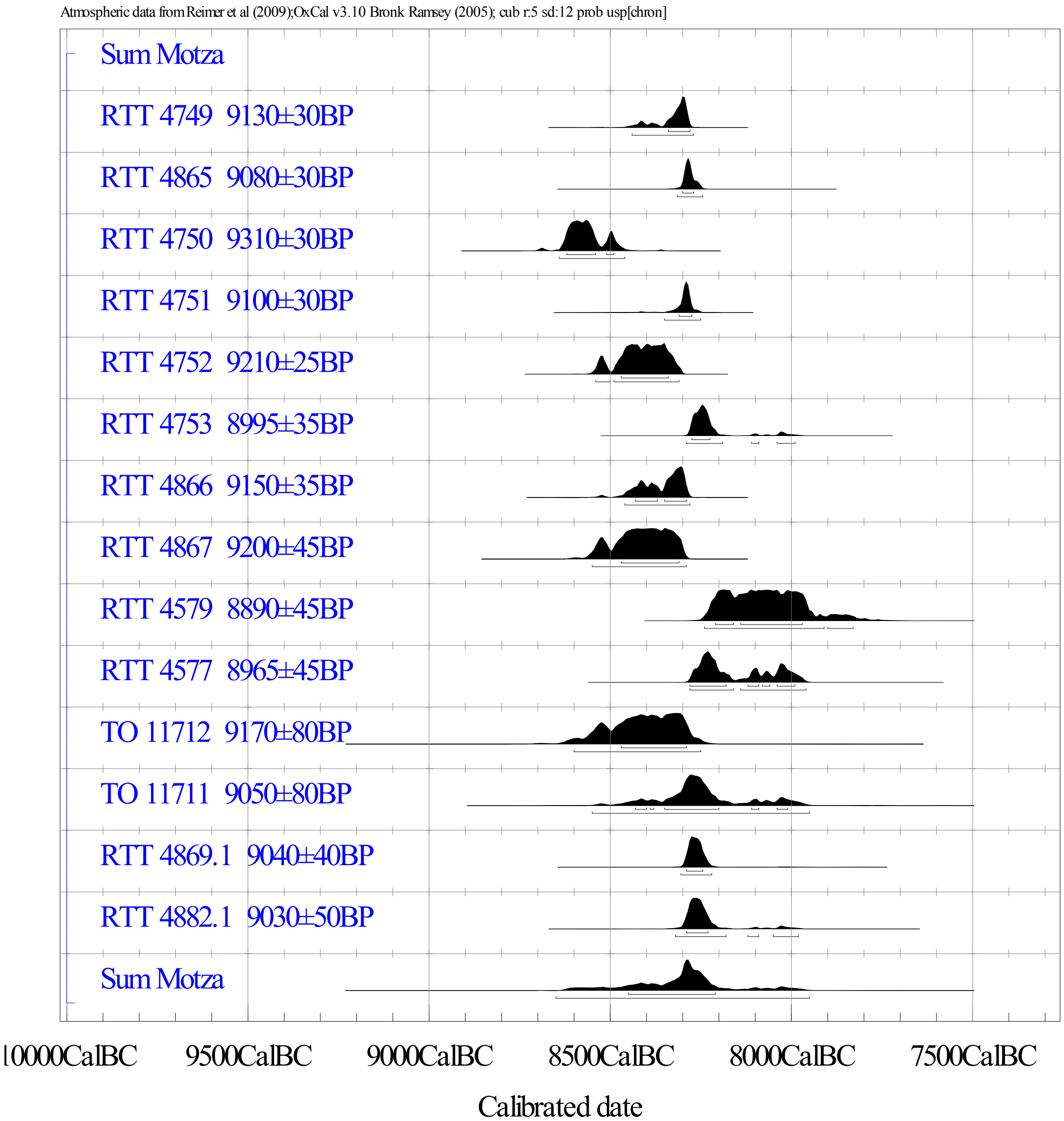
Nachcharini: 8300-6000 cal BC



Source: PPND – The Platform for Neolithic Radiocarbon Dates.

Asouti, Eleni, and Dorian Q Fuller. A Contextual Approach to the Emergence of Agriculture in Southwest Asia: Reconstructing Early Neolithic Plant-Food Production. Supplement A: Primary Sources of Archaeobotanical Datasets and Radiocarbon Dates from Southwest Asia. *Current Anthropology* 54(3).

Motza: 8450-8210 cal BC



Source: PPND – The Platform for Neolithic Radiocarbon Dates.

'Ain Darat, **El-Khiam**, **Nahal Lavan 109**, **Mujahiya** and **Karim Shahir** have not produced radiocarbon dates (for a discussion of their archaeological attributes in the context of the early PPN and further references see Kuijt and Goring Morris 2002, Peasnall 2000). **Salibiya IX** has given very few dates with very large standard deviations (Radiocarbon CONTEXT database). **Nahal Oren** has produced a single date attributed to the PPNA or the EPPNB horizon; however its stratigraphic position is unknown (PPND – The Platform for Neolithic Radiocarbon Dates). **Körtik Tepe** is reported by Riehl et al. (2012) to date between between 9700-9300 cal BC, while the earliest levels of the Iranian sites of **Jani** and **Sheikh-e Abad** discussed briefly in the paper are radiocarbon dated to the tenth and ninth millennia cal BC respectively (Matthews et al. 2010).

Sources: Kuijt, I., and N. Goring-Morris. 2002. Foraging, farming, and social complexity in the Pre-Pottery Neolithic of the southern Levant: a review and synthesis. *Journal of World Prehistory* 16(4):361–440; Matthews, R., Y. Mohammadifar, W. Matthews, and A. Motarjem. 2010. Investigating the early Neolithic of western Iran: the Central Zagros Archaeological Project (CZAP). *Antiquity* 84(323). http://antiquity.ac.uk/projgall/matthews323/; Peasnall, B. L. 2000. The round house horizon along the Taurus-Zagros arch: a synthesis of recent excavations of late Epipalaeolithic and early aceramic sites in southeast Anatolia and northern Iraq. PhD dissertation, University of Pennsylvania, Department of Anthropology, Ann Arbor; Riehl, S., M. Benz, N. J. Conard, H. Darabi, K. Deckers, H. F. Nashli, and M. Zeidi-Kulehparchec. 2012. Plant use in three Pre-Pottery Neolithic sites of the northern and eastern Fertile Crescent: a preliminary report. *Vegetation History and Archaeobotany* 21:95–106.