

# Prehistoric Agriculture at High Altitude on the Northern Colorado Plateau

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**Abstract.** Archaeological investigations east of Moab, Utah have revealed an ancient agricultural field with linear water control features at a high elevation (7,500 feet). Excavation in a nearby cave, believed to be associated with the use of this agricultural field, recovered many diverse cultigens in fine stratigraphic contexts. We believe these deposits date from the last half of the first millennium A.D. Human occupations of the cave were consistently brief and ephemeral. Human subsistence varied between the extremes of full reliance on wild species and heavy use of domesticated cultigens.

**Key words:** American southwest, Anasazi, egalitarian, Fremont, horticulture, hunter-gatherers, mobility, Pueblo.

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In the summers of 1994 and 1995 Utah State University conducted two 10-day field sessions east of Moab, Utah, to excavate portions of a large dry cave and to investigate a possible agricultural field. Both sites are at higher elevations (7,500 feet) than similar archaeological sites elsewhere on the Colorado Plateau (Fawcett 1994:15, 17; Table 1). Unlike Coombs Cave and Field, all of the other agricultural fields and water control features in Utah are near former Puebloan villages. In this article, we summarize the 1994–1995 field work and present some preliminary findings concerning early agriculture under marginal conditions near the boundary between the Anasazi and Fremont.

## An Agricultural Field With Water Control Features

Perhaps the most surprising part of our work is the discovery of an agricultural field. Coombs Field (42GR2685) is located far (5.6 km) from permanent water sources.

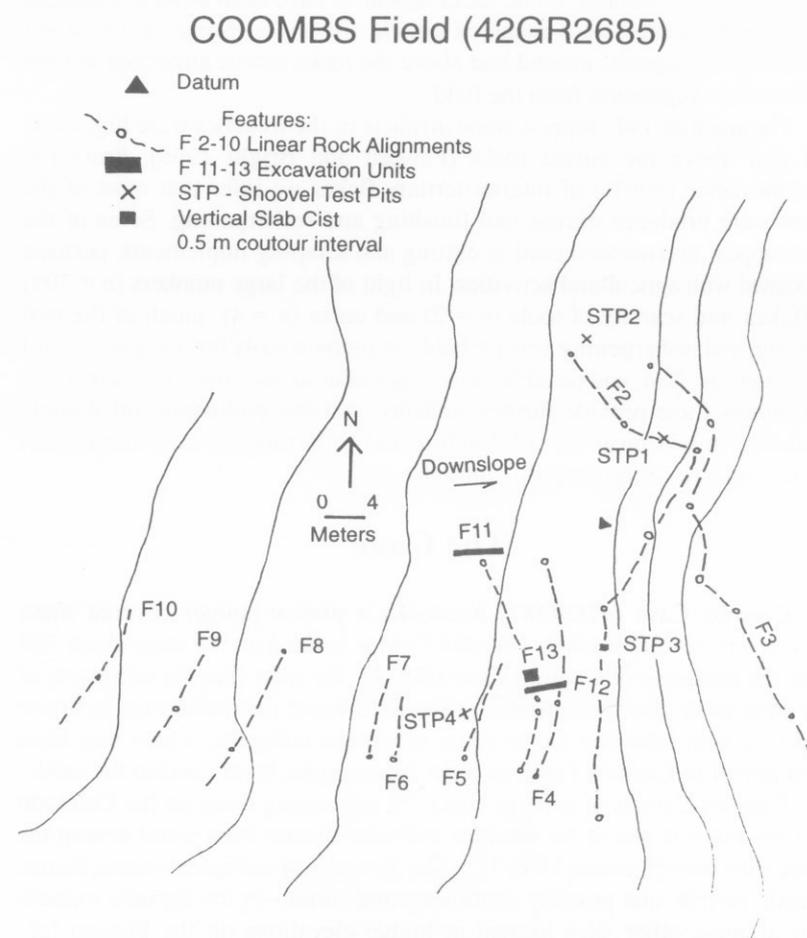
**Table 1.** Elevation of Puebloan agricultural fields and water control features in Utah.

Elevation (in feet)	Number of sites
<5,000	10
5,001–5,200	13
5,201–5,400	10
5,401–5,600	10
5,601–5,800	8
5,801–6,000	14
6,001–6,200	13
6,201–6,400	11
6,401–6,600	17
6,601–6,800	12
6,801–7,000	9
7,001–7,200	9
7,201–7,400	4
7,401–7,600	2

Source: Utah IMACS computer system, July 3, 1995.

A dense scatter of stone artifacts originally drew our attention to this site. Closer inspection revealed a series of nine rock alignments (Fig. 1:F2–10). They are composed of shaped sandstone slabs, including fragments of manos and metates. The incorporation of metates and manos into the alignments may be evidence for both the long-term use and maintenance of this field and the processing of crops in the vicinity of the field. Other rocks for construction of the alignments probably came from sandstone outcrops along nearby washes.

Woodbury (1961) refers to such linear stone alignments along contours as linear borders. Each alignment follows the contours across a pinyon and juniper-covered slope between two eastward-draining washes. They can be traced for no more than 40 m. At either end erosional gullies have cut through them to reveal sandstone slabs stacked several courses high. Between the gullies, the rock alignments are more poorly exposed. Linear arrangements of oak trees follow the projected course of the buried portions of the alignments. Together, the rocks and trees have trapped sediment behind them, so that the slope appears to be terraced. The field, as defined by the linear borders, covers about an acre (0.4 ha).



**Fig. 1.** Rock alignments and excavations in Coombs Field (42GR2685).

In 1994 we excavated shovel tests (STP 1–2 and 4) behind the alignments and in a cist (STP3) to collect soil samples for pollen analysis (Fig. 1). A side-notched arrow point, similar to others found in the cave, was found during the removal of the sample within the vertical-slab cist. These points do not fit neatly into existing types possibly because the sites are located near the Fremont-Anasazi boundary. Parts of what are believed to be a stalk of uncharred corn plant were also found near the datum.

In 1995 we excavated three trenches (F11–13) that crosscut the projected buried portions of the alignments (Fig. 1). Buried alignments of rocks were

found in the predicated locations at a depth of about 0.5 m. Many of the buried rocks were broken. Some rocks appear to have been shaped. Pieces of manos and metates were included among the rocks. Some of the wood charcoal in the deposits around and above the rocks can be attributed to fires used to clear vegetation from the field.

The quantities of chipped-stone artifacts in the trenches were highest at and just above the buried rocks (Fawcett and Bright 1996). From the predominance (>90%) of interior/tertiary flakes we infer that most of the flakes were produced during tool finishing and resharpening. Some of the flakes appear to have been used as cutting and scraping implements, perhaps associated with agricultural activities. In light of the large numbers ( $n = 709$ ) of flakes and scarcity of tools ( $n = 2$ ) and cores ( $n = 4$ ), much of the tool finishing and resharpening was probably to prepare tools for use and discard away from the field, and possibly for non-agricultural activities. Investigations at Coombs Cave provide further evidence that the prehistoric inhabitants continued to mix farming with hunting and gathering activities throughout the second half of the first millennium A.D.

### The Cave

Coombs Cave (42GR383) overlooks a pinyon-juniper covered mesa dissected by several washes. Coombs Field is located on the mesa about 300 m to the southeast of Coombs Cave (Fig. 2). We infer that the occupants of the cave were also responsible for the field based on similarities in arrow points at both sites and the presence of various cultigens, which may have been grown in Coombs Field, in some stratigraphic layers within the cave.

Coombs Cave is of average size (375 m<sup>2</sup>) among those on the Colorado Plateau, but it is one of the smallest and most distant from water among the caves with corn (Fawcett 1994:17). The diversity of cultigens--corns, beans, squash, gourds, and possibly sunflowers and cotton--in the deposits exceeds that at most other sites located at higher-elevations on the Plateau (cf., Matson 1991, Fawcett 1995).

By the time we visited the cave, vandals had dug a series of holes into the upper meter of deposits across the rear of the cave (Fig. 2). While searching for elaborate artifacts, such as textiles, hafted-tools and pots, they destroyed the stratigraphic context of the ecofacts and features over about 50% of the site, down to a depth of at least a meter. Most of their digging failed to penetrate the dense layer of rocks (including large boulders) created when large quantities of sandstone fell from the ceiling of the cave. We know from archaeological investigations of other intact caves (Matson 1991, Janetski 1993) that the inhabitants organized their activities to take into account differences in natural light, accessibility, dust, noise, slope, and micro-climate. The vandals' efforts have ensured that we will never be able to

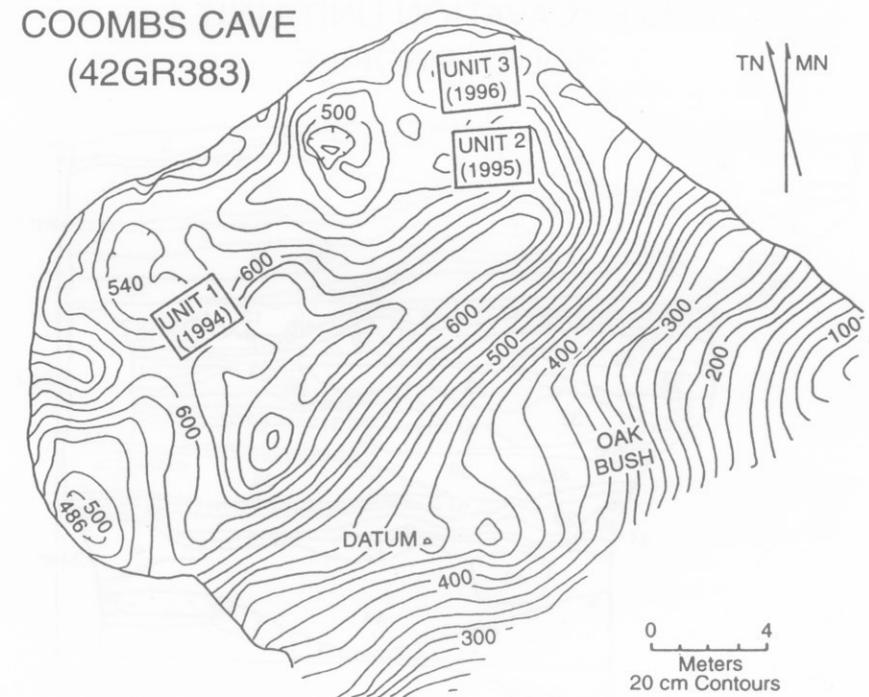


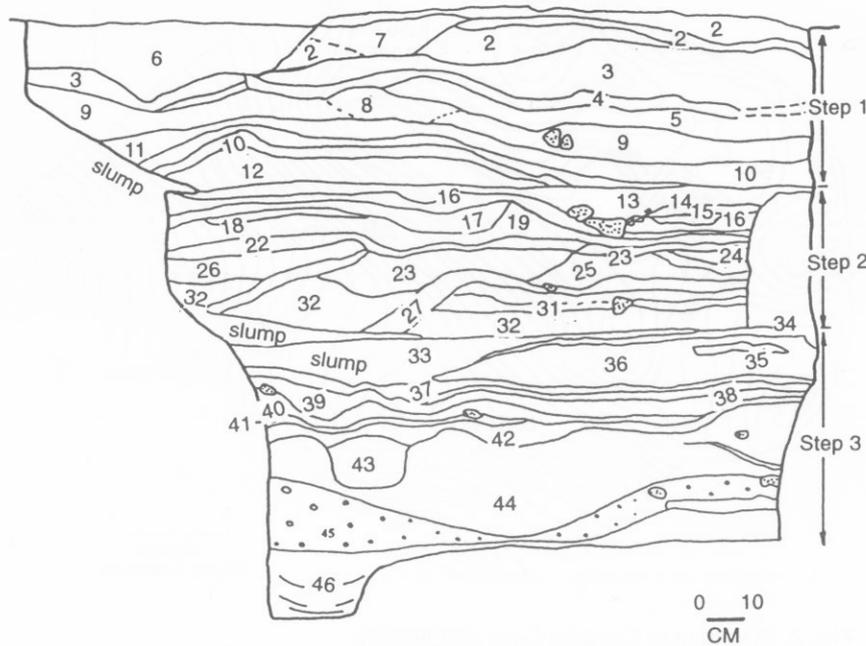
Fig. 2. Plan map of Coombs Cave (42GR383).

investigate questions concerning the spatial organization of Coombs Cave. Instead, our research examines changes over time in subsistence, climate, and regional land-use.

Three excavation units have been carefully excavated into the cave deposits (Figs. 2-4). This article concentrates on the 1994 and 1995 units because analyses of materials from the 1996 unit has barely begun. The units were located adjacent to the vandals' pits to take advantage of the exposed stratigraphy and avoid damaging more intact portions of the cave.

The deposits consist of extremely loose fine sand derived from the decomposition of the sandstone ceiling of the cave. Rocks rarely occur, except in cultural features (such as hearths) or in the roof-fall. Some large rocks, probably displaced from the roof-fall, occur in the vandalized deposits. Humans introduced grass, juniper bark, cactus, and other plants into the deposits, along with charcoal, artifacts, bones, and refuse. Layers of grass and plant fibers help to stabilize the sand and to provide clues for deciphering stratigraphic relationships.

COOMBS CAVE (42GR383)  
1995 EXCAVATION UNIT/UNIT 1  
SOUTH PROFILE



o. Layer Description:

- 1 Very fine grey-brown loose sand (dust - F3)
- 2 Fine grey-brown sand with grass chaff & charcoal, relatively sterile (F5)
- 3 Sterile medium-texture brown sand with charcoal (F6)
- 4 Lighter brown sand (similar to F5) with sandstone rubble, charcoal & some grass chaff, relatively sterile (F7).
- 5 Charcoal-stained fine sand with some charcoal, small sandstone rocks, juniper, charred pine nuts & grass (F8-9)
- 6 Vandal pit with mixed deposits of charcoal, small sandstone & grass chaff (F2)
- 7 Shallow-basin shaped hearth with sandstone rocks & pine cones (F4)
- 8 Shallow-basin shaped hearth with sandstone rocks, pine nuts, yucca leaves, coprolites & cordage (F10)
- 9 Medium-texture brown sand with sandstone rocks, snails, corn, matted fiber, oak leaves & cordage (F12)
- 10 Light colored sand with coarse grass, sandstone, yucca fiber, juniper bark & charcoal (F13)
- 11 Dark charcoal stained sand with grass & pine parts (F11) associated with fire hearth (F10)

Fig. 3. Profile of the 1994 excavation (Unit 1) at Coombs Cave (42GR383).

- 12 Medium-dark charcoal-stained sand with small sandstone rocks, oak leaves, & grass chaff, flakes, pine parts & coprolites (F14)
- 13 Loose sandy disturbed deposits (bottom of first step/top of second - F15)
- 14 Dark organic-rich fine sand with charcoal (F16)
- 15 Shallow-basin shaped hearth with sandstone rocks, seeds, pine parts, grass, juniper bark & potsherds (F17) dug into layer below (F18)
- 16 Loose sand with numerous sandstone rocks (F18)
- 17 Grey-brown loose sand with corn, grass, flakes, bone & charcoal (F19)
- 18 Shallow-basin shaped hearth with charcoal, grass, bone, flakes, yucca leaves, pine & juniper parts & cacti remains (F20) dug into layer below (F22)
- 19 Dark brown sand with charcoal (F22) associated with hearths (F18 & 20)
- 20 Shallow-basin shaped hearth with charcoal, bone, cordage, grass & juniper bark (F21) dug into F22.
- 22 Fine grey-brown sand loose sand with sandstone rocks - relatively sterile (F23)
- 23 Loose light-colored fine sand with charcoal, sandstone rocks & chaff - relatively sterile (F24)
- 24 Shallow-basin shaped hearth with sandstone rocks, charcoal, grass, pine cones & bone (F25) excavated into layer below (F26)
- 25 Sand with fine chaff & charcoal, & corn cob, coprolite, bone & mano (F26)
- 26 Shallow-basin shaped hearth with sandstone, charcoal, mano, bone & flake (F27) dug into layer below (F28)
- 27 Medium-dark fine sand with charcoal & grass (F28)
- 28 Shallow-basin shaped hearth with charcoal, sandstone, grass chaff, flakes, corn & coprolite (F29)
- 29 Dark sand with grass, charcoal, corn cob, metate, sandstone & cordage (F30)
- 30 Medium-dark charcoal-stained sand with sandstone, bone & grass (F31)
- 31 Shallow-basin shaped hearth with charcoal, sandstone, bone, pine nuts & corn (F32)
- 32 Medium-dark sand with charcoal, sandstone, potsherds, bone, yucca & flakes (F33)
- 33 Sandy disturbed deposits (bottom of second step/top of third - F34)
- 34 Light sand with biface, grass & charcoal (F35)
- 35 Shallow-basin shaped hearth with sandstone & charcoal (F37) excavated into next layer (F38)
- 36 Loose medium-dark sand with charcoal, sandstone, grass, seeds, flakes & bones (F38)
- 37 Loose light-color sand with some sandstone, charcoal, grass, corn & flakes - relatively sterile (F39)
- 38 Dark sand, relatively sterile (F41)
- 39 Lighter sand, relatively sterile (F41)
- 40 Even lighter sand, relatively sterile (F41)
- 41 Very light-colored sterile sand (F41)
- 42 Mixed/disturbed sand
- 43 Deep Pit (not observed until profile was drawn)
- 44 Loose grey-brown sand with few flakes, yucca leaves, a potsherd, corn kernel & bone - relatively sterile (F43)
- 45 Light yellow to red-brown sandstone dust (F44) overlying dense layer of sandstone rocks (F45) - Roof-fall
- 46 Heavily-fired hearth in a pit with charcoal (F47)
- 47 Unexcavated, loose light brown sand - relatively sterile (F48)

Note: (F#) = Feature Number

Fig. 3. Concluded.