NEW APPROACHES TO THE STUDY OF VILLAGE SITES IN THE TERRITORY OF VENOSA IN THE CLASSICAL AND HELLENISTIC PERIODS

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The territory of Venosa (Potenza - Italy), ancient *Venusia* (291 BC), is one of the best investigated Roman colonial territories in Italy. During more than a decade of intensive landscape archaeological research conducted in the context of the *Forma Italiae* project an area of seven hundred square kilometres has been investigated and more than two thousand archaeological sites dating from Prehistory to the Middle Ages have been mapped. This enormous quantity of data is now being used to protect and promote the cultural heritage of this area, and as a crucial academic instrument for further archaeological and historical research. Nonetheless, important historical questions remain to be scrutinized further. Especially in the light of recently developing research questions and improved ceramic chronologies, various facets of this ancient colonial landscape deserve detailed analysis. In the context of the 'Landscapes of Early Roman Colonization project' new field research has been conducted in the Venosa area, focusing on early colonial settlement organization and in particular on the role of nucleated rural sites within it. In this paper the outlines of this new research project will be presented as well as the results from one key site: the nucleated settlement site of Masseria Allamprese.

Introduction

The first systematic study of the territory of the Latin colony of *Venusia*, established in 291 BC, started in 1989, and was conducted in the context of the *Forma Italiae* project.[1] The goal of the *Ager Venusinus* project[2] was to map all archaeological remains within the ancient territory of the colony, which is situated in the modern day Melfese district, in-between the Ofanto valley and the slopes of Mount Vulture.[3] During more than a decade of intensive research the project was able to systematically cover five

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[1] On this project see Sommella 2009, pp. 47-59. The idea of an archaeological map of Italy dates back to 1889. Obviously, the methodology of this project changed over the years. Especially from the 1990s onwards, with the advent of information technology and satellite positioning systems (GPS) a new phase of archaeological mapping began and the *Forma Italiae* project started to develop a Territorial Information System for Archaeology in Italy (cf. Marchi, Sabbatini 1996, pp. 281-297).

[2] This project was a joint effort of the University of Rome 'La Sapienza' and the University of Foggia. The project was coordinated by Paolo Sommella and Maria Luisa Marchi.

[3] Cf. Bottini 1982, pp. 152-160.

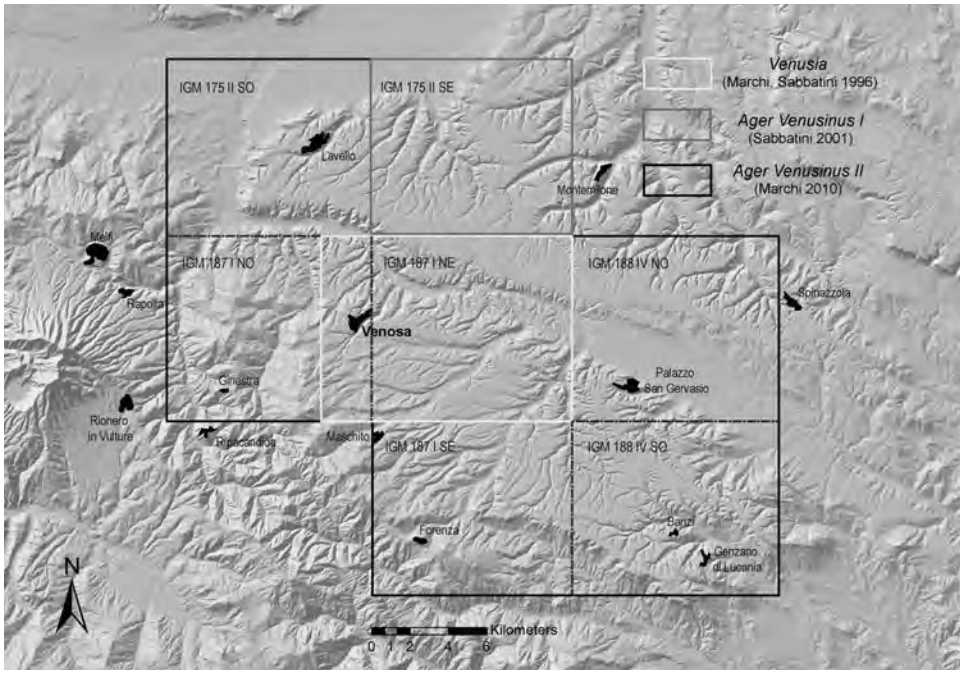

FIG. 1. Areas surveyed by the *Ager Venusinus* team (1989-2000).
The raster base of the image is created from the 10-m-resolution DEM for the Italian territory named TINITALY/01, (cf. TARQUINI *et alii* 2007; TARQUINI *et alii* 2012).

1:25.000 IGM sheets of the region (FIG. 1). These results have now all been published in three volumes of the *Forma Italiae* series.[1]

The large amount of data collected during the *Ager Venusinus* survey project offers an invaluable insight in the long occupation history of this important territory which is currently experiencing drastic landscape changes.[2] At the same time it constitutes an important source of information for broader research questions such as for example Roman demography and economy as well as for understanding pre-Roman forms of societal organization in the region. Most relevant in the context of this paper, is that the data collected by the Sapienza-Foggia research team offers a unique insight in the character and impact of Mid-Republican Roman colonization.[3] Nonetheless, our understanding of especially the earliest colonial phase remains incomplete. One of the main difficulties is the relatively small number of recognized colonial dwellings dated

[1] MARCHI, SABBATINI 1996; SABBATINI 2000; MARCHI 2010a.

[2] From the 1990s onwards large scale infrastructural works (such as the Fiat factory on the Melfese plain, the Bradanica road, and windmill farms) and changing rural regimes (esp. the planting of vineyards for the production of the famous Aglianico wine) drastically changed large parts of the Venosa territory and destroyed most of the archaeology with it. The *Ager Venusinus* project, however, was able to record large part of the archaeological landscape before its destruction. The data has now been used to create an archaeological risk map of the area (cf. AZZENA 2001, pp. 77-86).

[3] On this see MARCHI 2014.

securely to the period of colonization (i.e. the third century BC).[1] This problem is by no means specific to the territory of *Venusia*, since the problem of the missing early colonial sites is attested in all investigated Latin colonies of the Mid-Republican period.[2]

Although several explanations for the missing site problem have been put forward recently, there is now a clear need to test the validity of these various hypotheses in the field.[3] To this aim, and to enhance our understanding of this crucial moment in Roman and imperial history in general, in 2012 a new large-scale and interdisciplinary research project was started, entitled 'Landscapes of Early Roman colonization' (*LERC*).[4] One of the key themes this project investigates is the role of non-urban nucleated settlements in early Roman territorial expansion. With more than 10 nucleated sites dating to the Hellenistic and Republican periods, the *Ager Venusinus* data-set is one of the richest available for central-southern Italy. Recognizing the potential and value of further in-depth study of these sites, in 2013 a collaborative project among the University of Leiden, the University of Foggia, the Royal Netherlands Institute of Rome and the *Soprintendenza per i Beni Archeologici della Basilicata* was initiated, thus combining the diverse knowhow of these research institutes.

In order to unravel the vicissitudes of the often neglected settlement realities of villages or rural nucleated sites, a targeted multi-disciplinary research strategy has been developed aimed at 1) collecting new, high resolution data from a sample of such sites by combining intensive field survey techniques with geophysical and aerial prospection, and 2) a detailed (re)study of the collected Black Gloss pottery on those sites, using the improved ceramic chronologies now available for this region. In this paper we present the first results that this interdisciplinary research project has provided for one key-site in the area: Allamprese (Serra Tesoro). Because the new research presented here is based strongly on the results from the *Ager Venusinus* project, and allows interesting methodological comparisons too, we start with describing the sampling strategy that was adopted in the *Ager Venusinus* project, which also resulted in the discovery of the Allamprese village site.

Research strategy of the *Ager Venusinus* project and the discovery of the Allamprese site

Being part of the larger *Forma Italiae* project, one of the most important aims of the *Ager Venusinus* project was to systematically and accurately map all archaeological traces on IGM maps of the area.[5] To that aim, a large scale field survey of the area was combined with detailed bibliographic studies and with systematic analysis of aerial photographs.[6] All accessible fields in the research area were surveyed by field walkers

[1] When the available historical information available on the number of settlers is confronted with the collected settlement evidence a notable discrepancy becomes apparent (cf. Pelgrom 2008, pp. 336-342; Pelgrom 2013).

[2] E.g. Rathbone 1981; Cambi 1999; Pelgrom 2008; Rathbone 2008; Pelgrom 2013.

[3] Also Stek *et alii* in press.

[4] See http://landscapesofearlyromancolonization.com.

[5] Cf. Marchi 2010a, pp. 25-28. However, in the field Regional Technical Maps were used (*Carta Tecnica Regionale*, CTR) which have a better scale of 1:10.000 or 1:5000. For some towns, but not all, digital aero-photogrammetric maps were used.

[6] At the time, Italian landscape archaeology was in a very dynamic period, characterized above all by intense discussions on field methodology and cartographic conventions (cf. Plog, Plog, Wait 1978, pp. 389-394; Belvedere 1994; Terrenato 1996; Quilici, Quilici Gigli 2001, p. 45; Carandini, Carafa, Capanna 2007, pp. 13-25; Manacorda 2007). The *Ager Venusinus* survey, although part of the tradition of the *Forma Italiae* project, experi-

divided in teams of 3 or 5 persons with 5 to 10 meters spacing between walkers. Since cereal cultivation predominates in the Venosa area, the ideal period for field survey was from the end of the summer until late autumn, when the fields had been harvested and ploughed, thus offering the best visibility. However, not all fields offered good visibility circumstances during this period. This was in particular true for olive and vineyards which were covered often with vegetation in this season. The ideal season for those areas turned out to be winter and spring. As a general rule, therefore, fields with bad visibility during the summer-autumn survey campaigns were revisited during the winter-spring season.[1]

All notable artefact scatters were recorded and mapped accurately on 1:10.000 topographic maps of the area. However, the large fields which characterize the area made precise orientation and localization rather difficult. To overcome these difficulties, the project was one of the first in Italian archaeology to adopt, from 1989 onwards, the use of a GPS.[2] At first WM102 receivers were used that took approximately two hours to plot a single location. For time concerns, in this phase the GPS was used only to create a reliable regional measurement system, which could be precisely integrated with the IGM coordinate system. Later on, new and much more efficient GPS receivers became available (Trimble - Pathfinder Pro XRS), which allowed the recording of all sites and site contours by means of GPS measurements. The usage of a universal coordinate systems and the very precise localization of archaeological sites made it possible to integrate the field data with other data sources, such as ancient cartography, geomorphological maps, etc. in a GIS.

Site classification

As regards the interpretation as 'sites' of different types of surface scatters, in the *Ager Venusinus* project scatters were classified according to quantitative parameters such as size and density, as well as on the basis of qualitative criteria, such as the composition of the material found in these scatters (e.g. presence of construction materials, decorative elements, evidence for production etc.). With regard to site sizes, only the areas with the greatest concentration of material were recorded (a 5 shards per sq. m. threshold was used for historical and proto-historical periods). To systematize the interpretation of the field survey data, the *Ager Venusinus* project adopted the following classification system. The smallest sites with artefact scatters of less than 200 sq. m., containing only very poor material culture, were classified as 'rural structure', which in Roman historical terminology might correspond to the settlement realities known as *casae*, *tuguria*[3] or *villulae*.[4] Scatters in-between 200 and 1000 sq. m., or those smaller with clear evidence for agricultural activity were classified as 'farms'. Larger sites were classified as 'villas' or 'villages' using a combination of site size (over 1000 sq. m.) and

mented and applied many of these new insights in its research design, such as the systematic coverage of a sample area, the recording of off-site scatters and the usage of new digital and satellite technologies (see below). For the Venosa region, this intensive methodology resulted in a 90% increase of information about the settlement history of this territory.

[1] General visibility conditions, based mostly on cultivation practices, have been recorded and published in visibility maps (see MARCHI, SABBATINI 1996, p. 107).

[2] Cf. AZZENA 1992, pp. 747-776.

[3] LIV., III, 13; III, 26; XLII, 34; V, 53, 8; PLIN., *Nat. Hist.*, XVI, 14; VERG., *Ecl.*, I, 69; COLUM., *R. R.*, XII, 15, 1; FESTUS, s.v. *tugurium*.

[4] CIC., *Ad Att.*, VIII, 9, 3; VIII, 13, 2; XII, 27; XVI, 6, 2; APUL., *Met.*, I, 21.

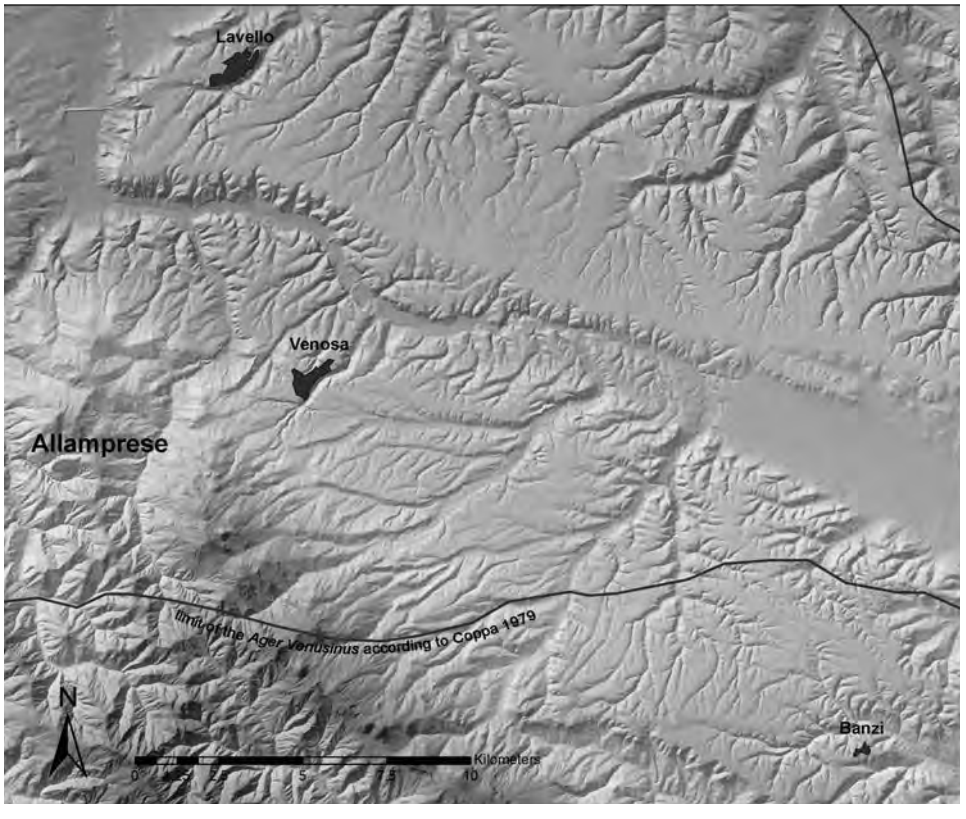

FIG. 2. Location of the Allamprese site. In grey the location of the modern towns in the area.

chronological criteria. The term 'villa' was only applied to sites of the Roman period with high quality materials (such as marble, mosaics etc.). This systematic research strategy resulted in the detection of over 2000 archaeological sites, including the Allamprese village site, which is central to this paper.

The Allamprese village site in the Ager Venusinus *survey*

In the 1990s the site was localized at c. 7.5 km to the south-west of Venosa, in the territory of the modern communality of Ginestra (FIG. 2), on a ridge (alt. c. 550 m.) measuring approximately 40 hectares. On that distinctive landscape unit, the *Ager Venusinus* survey team mapped a dense cluster of small sites gravitating around one large and very dense scatter of ceramics and building material of about 3500 sq. m. (FIG. 3). In total 13 separate sites were identified (FIG. 7. Sites 469-508), the majority of which measured between 50 and 200 sq. m. and contained predominantely material dating to the Late Classical - Early Hellenistic periods (sites 497-500 and 506 - 508).[1] A few of these scatters, located at the centre of the hill-top plateau, however, also contained more recent material

[1] A few smaller ones of comparable chronology have been classified as tombs (based also on the findings of bones and ashes: sites 496, 504-505).

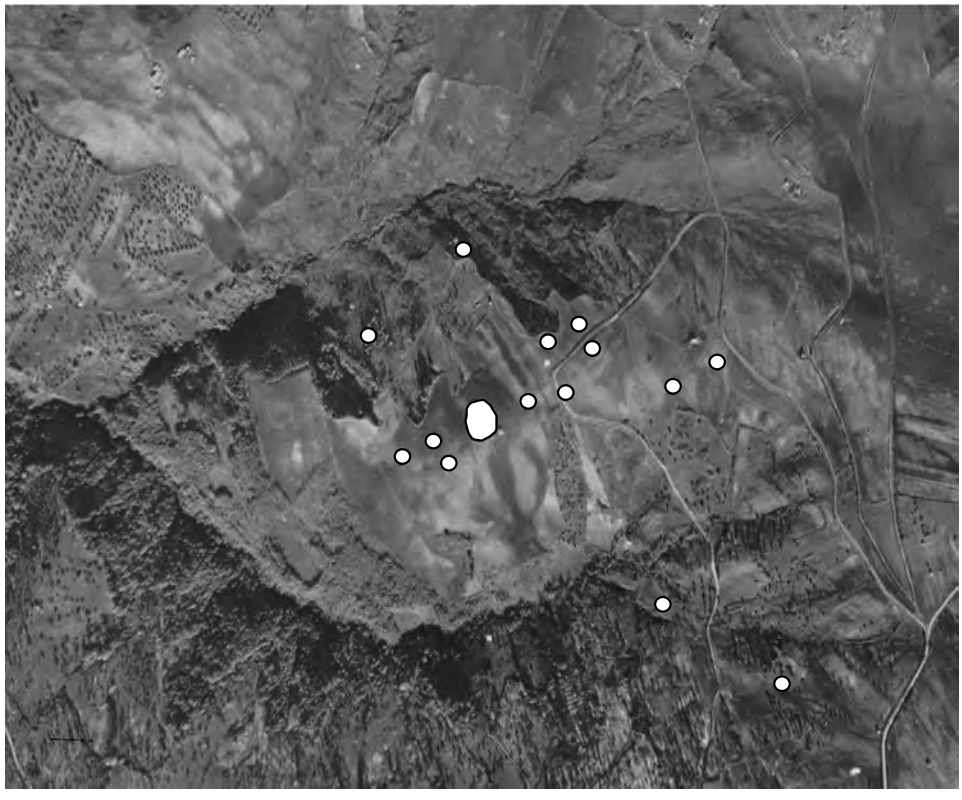

FIG. 3. Sites mapped by the *Ager Venusinus* team plotted on an aerial image of 1980 (courtesy of the *ICCD* Rome).

of Republican and Imperial date (sites 501-503).[1] The complex of closely neighbouring artefact scatters was at the time classified in its entirety as a pre-Roman village, which was abandoned in the early colonial period. After a break of several generations, in the Late Republican period, the area would have been resettled on a more reduced scale. The character of this later settlement would have been a villa that continued to exist well into the Imperial era.[2]

NEW RESEARCH INTO THE VICISSITUDES OF VILLAGE SITES IN THE VENOSA AREA IN THE CONTEXT OF THE *LERC* PROJECT

Although it is clear that the settlement organization of the Venosa territory changed radically in the course of the Roman Republican period, important gaps remain in our understanding of the precise pace and nature of these developments. This is particu-

[1] One of which was interpreted as a burial (site 503).

[2] MARCHI 2010a, pp. 128-134 and p. 252 adds that most probably the village was founded by the Samnites and that it pertained to a network of similar villages in the region. On the supposed abandonment of the Allamprese village in Mid-Republican times see MARCHI 2010a, p. 255.

larly true for the transformation process of the Archaic-Classical village landscape into a rural territory characterized by a dense network of regularly spaced farms in the Roman period. Recent studies have in fact argued that villages might have survived longer than is often assumed, and may have played a crucial role in the early Roman colonial settlement organization.[1] In order to test this hypothesis the LERC research group reanalysed all accessible nucleated sites of the *Ager Venusinus* data-set with a chronology in-between the Late-Classical and Hellenistic periods, using a multidisciplinary approach.

Data collection and sampling strategy

The research focused on retrieving high resolution data that permits a better understanding of the precise chronology and the changing morphology and organization of nucleated settlements in the late-fourth to second centuries BC. For the region and time-period under consideration, the most important type of material culture which allows for the aspired chronological resolution and which is present in significant quantities on the selected sites is Black Gloss (BG) pottery.[2] We therefore decided, in the light of the available excellent previous survey data on the extension and general character of the site, and our specific chronology-oriented research question, to only collect Black Gloss pottery during the resurvey of the site. Focusing on one class of material culture to reconstruct settlement dynamics has of course its obvious methodological pitfalls. On the other hand, these should probably not be exaggerated as recent research shows. Notably, Helga Di Giuseppe[3] has argued, based on a large number of case-studies, that the settlement dynamics reconstructed from BG pottery, if corrected for general consumption trends, do not produce significantly different patterns than those studies which include coarse wares and other types of pottery.

In light of these considerations, and the very specific research question in mind, the first phase of the LERC research aimed at a systematic collection and analysis of BG pottery from the selected nucleated sites. In order to make the results of such a diagnostic sampling strategy comparable with the regular transect survey strategy employed in the other sample areas of the LERC project, fields were first surveyed using a systematic line walking strategy with 10 meters intervals between field walkers.[4] High density artefact scatters were recorded using a 5 shard per sq. m. threshold to establish contours. This is comparable also to the method used by the *Ager Venusinus* team, and thus allows for a reliable comparison between site-contour data collected by the different teams in different years.[5] Conversely, only BG shards were collected from the field and analysed. The precise position of every single BG shard was recorded using a Topcon DGPS in order to be able to reconstruct the spatial distribution of collected BG shards. In a second phase all fields were resurveyed in a more random manner, with the aim to collect as

[1] On this possibility for Venosa see Torelli 1991, p. 22. In general on the presence and role of villages in colonial territories see Pelgrom 2008; Stek 2009, pp. 123-170.

[2] The alternative would be Greco-Italian Amphorae which have been retro-dated recently (cf. Olcese 2004). However, both the difficult recognizability in the field (they are difficult to distinguish in the field by non-experts) and the more coarse chronological resolution, make this class of ceramics less suitable for this type of research. The same is of course true for coarse ware pottery.

[3] Di Giuseppe 2012, esp. pp. 11-12.

[4] This results in a theoretical 20% coverage of the investigated area. The survey team was composed by mostly experienced field walkers.

[5] Cf. Marchi, Sabbatini 1996, p. 134.

many BG shards as possible. The locations of these shards were also recorded using a DGPS, but they were administered separately.[1]

Aerial remote sensing and geophysical prospection

To complement the chronological information extracted from the BG pottery distribution patterns, the selected nucleated sites have been subjected to a combination of remote sensing techniques. The specific geo-pedeological properties of the Venosa territory, consisting predominantely of compact layers of pebbles, embedded in clay or sandstone, are not favourable to the easy detection of sub-surface structures.[2] The thin top-soil in combination with the poor soil permeability seriously hamper any attempt at remote sensing prospection. Also the fact that in the Hellenistic period the bedrock pebble material was used for the foundation of walls and of roads, makes it very hard to distinguish those through remote sensing techniques.[3] In fact, a small scale experiment with vertical magnetic gradiometer (Bartington G601-Fluxgate Gradiometer) survey on two nucleated sites,[4] yielded only very limited results. Only after intensive processing of the geophysical prospection data, some features could be detected. These remain, however, very difficult to interpret as is shown in the results section below.

More valuable results were acquired from the study of old and recent aerial images. Also in this case, the detection of sub-surface features in the form of crop and soil marks only had limited success. But the detailed 3D terrain models which could be generated from this data allowed us to reconstruct the changing morphology of the hill-top plateaus on which most of the nucleated sites are located, over the last 70 years. This contributed to our understanding and interpretation of the archaeological surface record.

For the region fairly good historical images are available in the archives of the *Istituto Centrale per il Catalogo e la Documentazione* (ICCD) in Rome and of the *Istituto Geografico Militare* (IGM) in Florence, dating back to 1953. Moreover, good satellite data of the region is now freely available on the web (GoogleEarth), for 2002 onwards. The historical photographs have been studied in autoptic and stereographic / photogrammetric mode. Research has been carried out on the original printed version of photographs and in a digital GIS environment, where specific chromatic gamma variations[5] and histogram refinements could be modified or compared accurately and geometric shapes or recognized features could be measured in real world units.[6] In order to enhance the ground resolution of images and to be able to generate accurate 3D models we also used a DJI Phantom 1 drone. This simple UAV multirotor platform was equipped with a 16 MegaPixel compact camera accurately synchronized with an on-board GPS logger in continuous RTK recording mode. Both the historical and UAV sets of images have been

[1] It is worth underlining that, for each field survey unit, the visibility conditions of the surface at the time of coverage have been recorded, thus allowing for a reliable correction (if necessary) of artefact densities and site recovery rates.

[2] For the methodological difficulties of aerial archaeology in the area, cf. CANTORO, PELGROM, STEK forthcoming.

[3] Recent excavations at the nearby Casalini site clearly show how house foundations are built from the pebble material found in the bedrock. Usually those pebbles are larger than those present in the bedrock. The excavation is currently in the phase of publication (cf. GIAMMATTEO 2014).

[4] I.e. Casalini and Allamprese. The geophysical mapping of the sites was conducted by the Laboratory of Geophysical-Satellite Remote Sensing & Archaeo-Environment Institute for Mediterranean Studies, under the direction of Apostolos Sarris and Gianluca Cantoro (cf. SARRIS, CANTORO 2013).

[5] Cf. FORTE 1993, p. 55.

[6] FORTE, GUIDAZZOLI 1991, p. 11.

processed with photogrammetric software to create accurate elevation models and orthophotos.[1]

Black Gloss pottery analysis: towards a new chronological framework

Very little research has been done on Black Gloss (BG) pottery production and consumption patterns in the Melfese area.[2] As a consequence, archaeologists working in this region inevitably have relied on general reference studies such as Morel's *Céramique campanienne: les formes*,[3] despite the fact that several scholars have recently exposed the problems and limits of this study for south-Italian BG productions.[4] These studies argue convincingly that regional chronologies which are based on solid stratigraphic data need to be developed. Regrettably, for the Melfese region such a regional chronology does not yet exist. However, for the wider region, various excellent new studies have been published that improve our understanding of the chronology and distribution of south-Italian BG pottery considerably.[5] To illustrate the effect these new studies have on our understanding of BG chronologies, FIG. 4 provides the variations in BG chronologies proposed by those studies for one of the most recurrent BG vessels found, namely the *skyphos* (FIG. 5).[6] The graphs illustrate clearly that marked differences exist in the proposed chronologies of the various *skyphos* types.

The main conclusion that can be drawn from this preliminary comparative exercise is that BG forms with comparable morphological characteristics seem to have circulated for significant longer time periods than suggested by Morel's seminal study. Whereas especially the Apulian stratigraphic contexts suggest that a number of types started to be used much earlier than previously presumed, the well-dated chronologies of Tricarico attest on the contrary to the occurrence of many types in later chronological contexts.[7] The down side of these prolonged chronologies is of course that the dating

[1] Where ground control points were not available or not sufficiently accurate, the photographs were geo-referenced with *AutoGR-Toolkit*, a freely distributed tool which allows for automatic image matching and geo-referencing (CANTORO 2012) based on SIFT algorithms (LOWE 1999).

[2] A notable recent study is DI GIUSEPPE 2012.

[3] MOREL 1981. On the importance and problems of BG as fossil guide for surveys see for example FRACCHIA 2013, p. 187.

[4] E.g. LIPPOLIS 1994, pp. 239-241; HEMPEL 1996, p. 337; YNTEMA 2001, p. 139. In general on the method and problems with Morel's approach see ROTH 2007, pp. 40-65 and DI GIUSEPPE 2012, pp. 1-8. The problem is most salient for the 3rd to 1st century BC. For long, the Pyrrhic War and the defeat of *Tarentum* were considered to have reduced Black Gloss production in the region to a minimum and to have started an era of abandonment and strong economic decline. Since the dating of site destruction layers or abandonment phases happened almost exclusively on BG chronologies, the historical image of decline was reinforced by way of this circular interpretation process (cf. ROTH 2013).

[5] For example, Douwe Yntema (YNTEMA 2001) proposed a new BG chronology based on stratified and well dated archaeological layers at Valesio (Brindisi - Apulia); Olivier de Cazanove (DE CAZANOVE 2008) reanalyzed the BG data from Tricarico (inland Basilicata), using C14 for establishing the absolute chronology of the archaeological layers. Other fundamental work in the region are: PRAG 1992 on Gravina di Puglia; LIPPOLIS 1994 on Taranto; SMALL, SMALL 2010, pp. 243-280 on San Felice and LANZA CATTI *et alii* 2011, pp. 143-270 on Metaponto. Although not about the region, the study of ROTROFF 1997 on the Hellenistic pottery of Athens remains fundamental. For a synthetic discussion of the impact these new studies have on regional BG chronologies see DI GIUSEPPE 2012, pp. 14, 122-123, fig. 113.

[6] *Skyphoi* are the most frequent BG forms found in the *LERC* data-set (ca. one quarter of the entire data set).

[7] See YNTEMA 1997 and YNTEMA 2014, p. 169, for the positive impact these new BG chronologies have on our understanding of the so-called dark periods (5th and 3rd centuries BC).

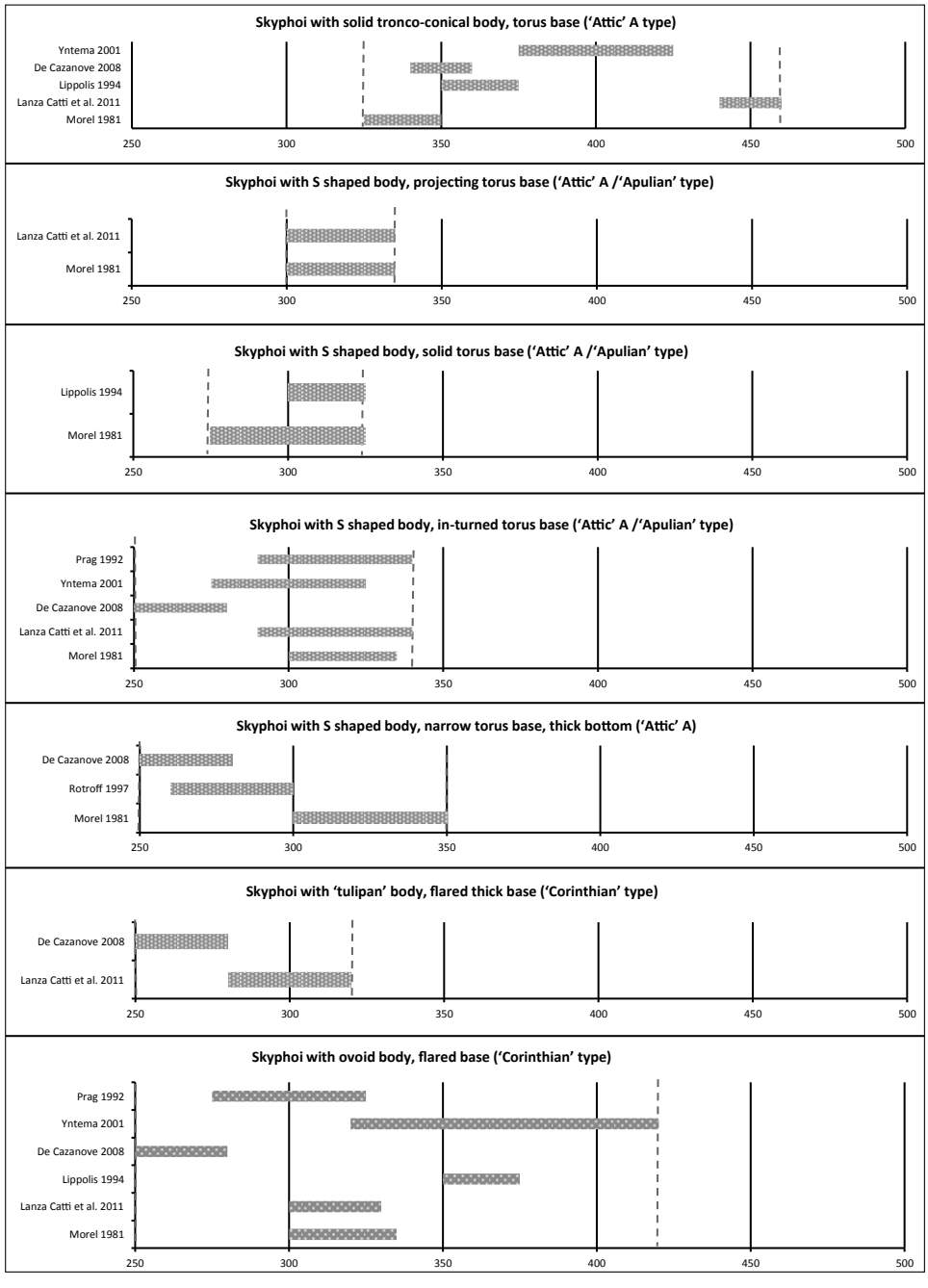

FIG. 4. Chronologies of *skyphos* types as proposed by different scholars.

precision of a specific form decreases and as a consequence also the chronological resolution one can aspire to attain.

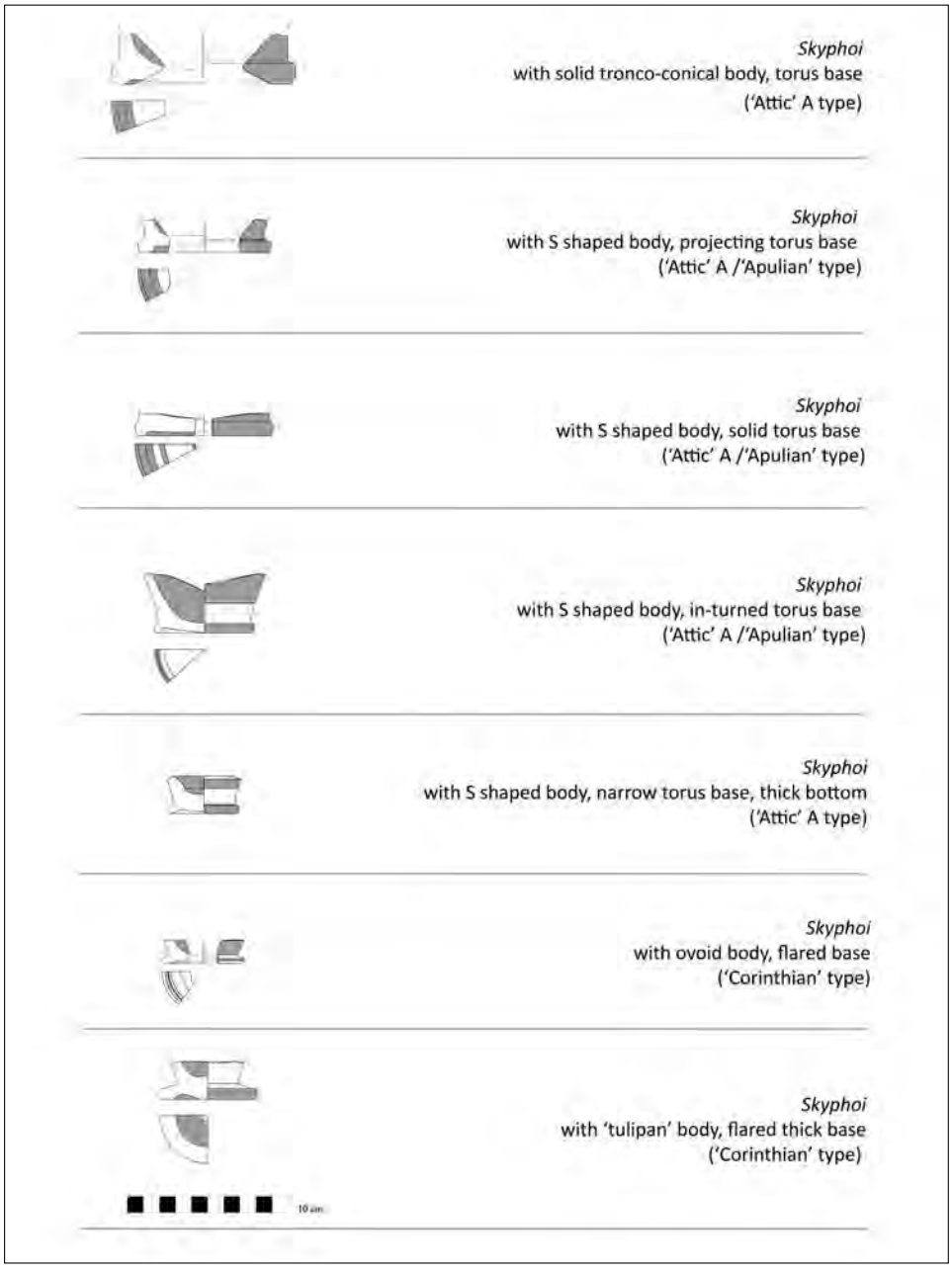

FIG. 5. Drawings of various *skyphos* types found during the LERC surveys.

Nevertheless, within these prolonged chronologies there are periods of significantly increased consumption. Also, it is clear that within the larger Apulian-Basilicata region different trajectories of pottery distribution occur, and that for example the early pres-

FIG. 6. Fragment of bowl with thickened rim and tronco-conical body from the Venosa area.

ence of a specific form in Taranto does not necessarily indicate the same chronology for this form in the inlands of Basilicata. In order to take account of these and other factors we developed two correlated dating systems. The first consists of an expert evaluation of the most likely chronology of a given shard by considering four criteria: 1) morphologic similarity between forms; 2) distance between find locations; 3) number of contexts a specific form appears in; and 4) the method used to date a specific form.

To give an example: in our data-set we have 5 fragments of bowls with thickened rim and a tronco-conical body with a diameter between 16 and 22 cm (FIG. 6).

The form is comparable to Morel's type 2955a1 (from Cosa, Tuscany) which he dated to 190/180-140 BC. However, similarly shaped forms have also been found at Tricarico, which in that case have been dated stratigraphically to the middle of the third century BC.[1] In morphological terms the closest parallel comes from Valesio in Apulia. In that case the excavated context suggests a late 3rd-early 2nd century BC date.[2] Finally, in Botromagno, Gravina di Puglia, similar forms have been found in stratigraphic contexts dating to the entire 3rd century BC.[3] The totality of found parallels thus suggests a maximum chronological range of two centuries: 3rd to mid 2nd centuries BC. Yet, taking into account the above mentioned four criteria, a more likely date range for this shard seems to be: middle of the 3rd-early 2nd centuries BC (suggested *LERC* chronology), thus narrowing down the range with a century.

In order to account for the possibility that the particular pot may have been produced earlier, as seems to be suggested by fragile evidence from the Gravina di Puglia excavations, we added to our analysis an unequally distributed period value dating method.[4] This method consists of a numerical assessment of the probability that a shard occurred in a specific period, considering again the four above mentioned criteria. For each

[1] DE CAZANOVE 2008, similar to n. 524, p. 594 with more rounded profile (from Tricarico, Basilicata, «bols à bord épaissi», ref. to Morel's 2978 series, Lamboglia's 30 form, Kirsopp Lake's 17 type from *Minturnae*, Lazio, middle of the 3rd century BC).

[2] YNTEMA 2001, n. 268, p. 166 (from Valesio, Apulia, K21 type «deep bowls with slightly thickened rim»).

[3] PRAG 1992, n. 801, p. 291 («flat-rimmed or lipless bowls», found in layer dating to Gravina VI, 4th-3rd century BC and Gravina VII, middle and late 3rd century BC).

[4] This method differs slightly from the weighted average method used by for example by DI GIUSEPPE 2012 (on the method see pp. 11-12), as it divides period values unevenly, taking four criteria into consideration.

criterion a value of 1 to 3 has been assigned for each 25 year period within the total chronological range of a specific form.

	Applied criteria
Morphology	3 = close morphological parallel; 1= least convincing match
Distance	3 = parallels are found close-by (< 100km); 1= over 300 km
Occurrence	3 = three or more parallels suggest this date; 1= one parallel suggests this date
Quality	3 = from well dated stratigraphic context; 1= not dated stratigraphically and/or radiocarbon date
Average	Average per period of the different grades
Period value	Correction of average in order that the total is always 1 (shard). To this aim the average values have each been divided by the total sum of averages.

In the above described example such an assessment would result in the following values:

Period	300-275 BC	275-250 BC	250-225 BC	225-200 BC	200-175 BC	175-150 BC
Morphology	2	2	2	3	3	2
Distance	3	3	3	2	2	1
Occurrence	1	1	2	3	3	2
Quality	2	2	3	3	3	1
Average	2	2	2,5	2,75	2,75	1,5
Period value	0,148	0,148	0,185	0,203	0,203	0,111

We realize that this dating method is experimental and might not convince everyone. Therefore, in our analysis we have used different dating strategies: those based on Morel's chronologies, those based on the corrected *LERC* chronologies,[1] and finally those that have been based on the unequally distributed period value dating method (cf. below).

Preliminary results from the nucleated village site of Allamprese

The Masseria Allamprese site was investigated in two campaigns organized in October 2013 and 2014.[2] In total an area of 30 hectares has been resurveyed, thus covering most of the area identified by the *Ager Venusinus* team as pertaining to the nucleated settlement.[3] Altogether 14 nuclei have been mapped with shard densities over 5 per sq. m.

[1] In these two cases we have used the weighted average method of Di Giuseppe 2012, pp. 11-12, to reconstruct trends.

[2] According to the owner of the field, the area is also known as Masseria Pallarone, after an old Masseria with a thatched roof that once controlled the area.

[3] The north-eastern and less densely settled part of the ridge was not resurveyed as visibility circumstances were not optimal. In that area the *Ager Venusinus* team identified four small sites (i.e. sites 503, 504, 506 and 507).

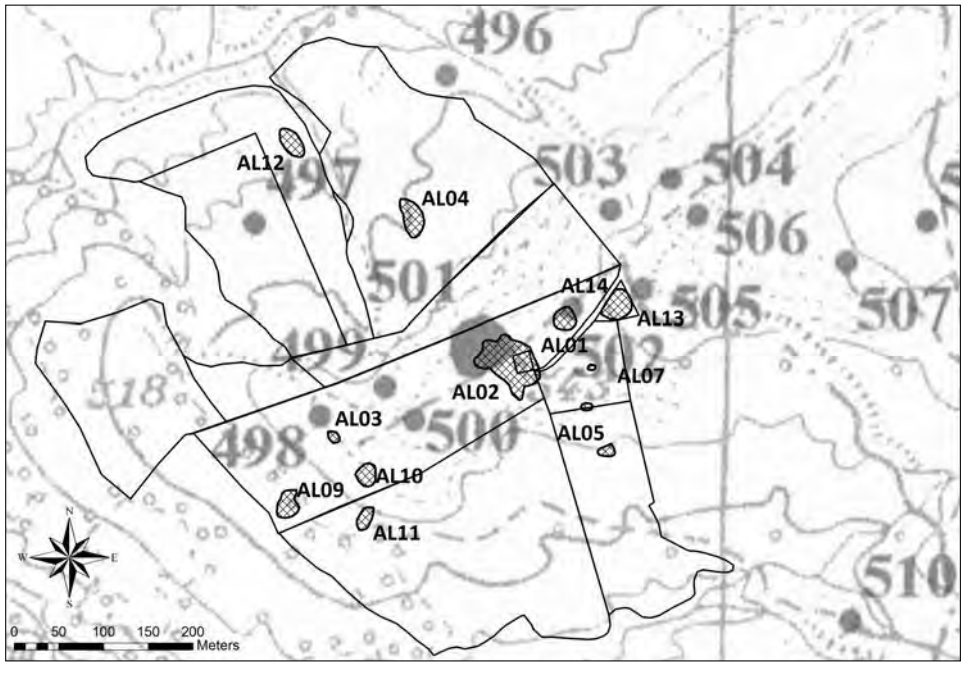

FIG. 7. Comparison between *Ager Venusinus* and *LERC* sites.
The black lines indicate the *LERC* survey areas.

Those recognized on the flat ridge-top correspond reasonably well with the ones documented by the *Ager Venusinus* team. The large nucleus of the settlement, in terms of its size and location, changed little in the more than two decades in-between the two surveys.[1] The same goes for the content of the assemblage which was still characterized by large numbers of tiles, *amphorae*, coarse and fine wares including Black Gloss, Italian and African *Sigillata*. The smaller nuclei, on the other hand, proved to be less static as their positions seemed to have changed over the years. Interestingly, they moved mostly in a western direction for about 15 to 100 meters. Since the orientation of this displacement corresponds with the ploughing direction, this difference is likely caused by this agricultural practice, although we cannot exclude that minor differences are the result of georeferencing the *Ager Venusinus* data or of different mapping procedures. Arguably, the most significant deviancy from the *Ager Venusinus* site map was recorded on the south-eastern hill slope. While the *Ager Venusinus* team did not record sites in this area, our survey mapped a total of 3 small, but very dense ceramic scatters, mostly composed of building material and a large amount of ceramic fragments. Since these find concentrations are likely the result of slope wash processes (cf. below) these findings do not alter the general understanding of this settlement reality significantly (FIG. 7).

As we have outlined above, our research focused on the collection and precise recording of Black Gloss pottery. Overall, we were able to collect and map 449 Black Gloss pottery shards spread out over most of the survey area, resulting in an overall density

[1] *Ager Venusinus* team: 0.35 ha; *LERC* team: 0. 29 ha.

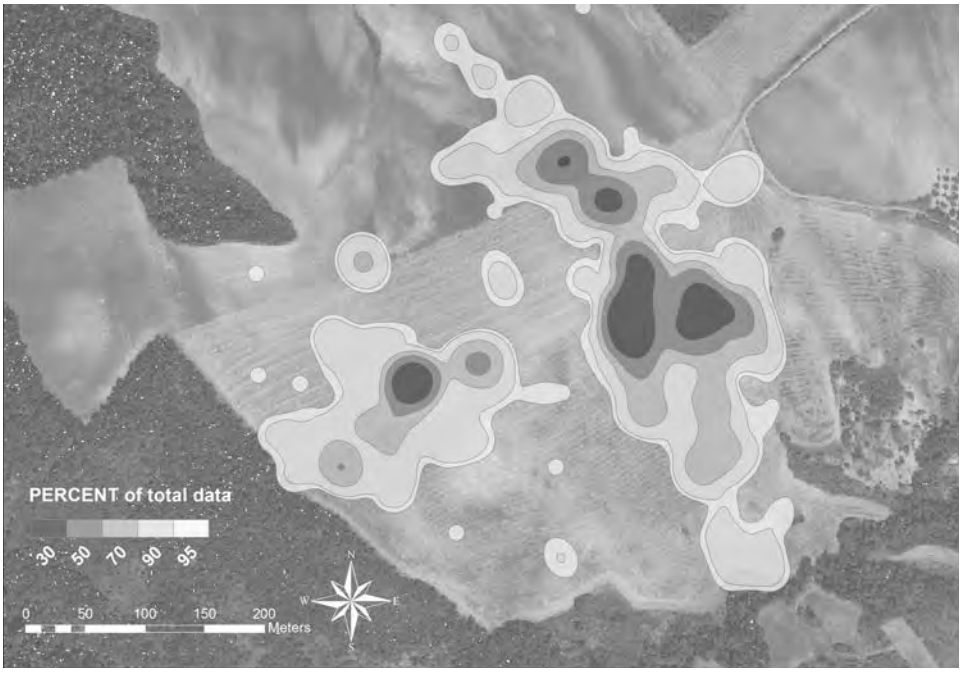

Fig. 8. Density map of BG shards found on the Allamprese site. For the interpolation a kernel method was used with a search radius of 30 m. The densities represent Percent Volume Contours, which is a method to display the % of a cumulative distribution.

of 15 shards per hectare (Fig. 8). The distribution pattern of the BG pottery clearly indicates two distinct areas of high BG pottery concentration, of which the north-eastern cluster is significantly larger and denser. As we will discuss in more detail below, erosion processes are likely responsible for the BG concentrations on the steeper hill slopes and lower areas. Most likely the core of the settlement concentrated on the hill-top plateau, around the modern outbuilding, and covered an area of about 3 hectares. The south-western cluster is considerably smaller, but the number of shards is still notably higher than what is usually found on isolated farms of this period, and thus suggest a clustering of activity also in this area.[1] The overall pattern thus matches rather well the interpretation of the *Ager Venusinus* team that we are dealing with a nucleated settlement of considerable size which consisted of several settlement cores around which isolated dwellings and / or graves gravitate.[2]

Understanding the settlement landscape

Obviously, shard density patterns do not correspond directly to buried archaeology or to ancient settlement realties. As is well known, artefact assemblages are shaped by all

[1] Small isolated farm sites produce on average less than 3 BG shards (cf. site catalogue in Marchi, Sabbatini 1996).

[2] For a recent excavated example in the region of such a multiple core nucleated settlement see Giammatteo 2014. In an area of 0.1 hectares the excavation revealed the presence of 5 separate buildings.

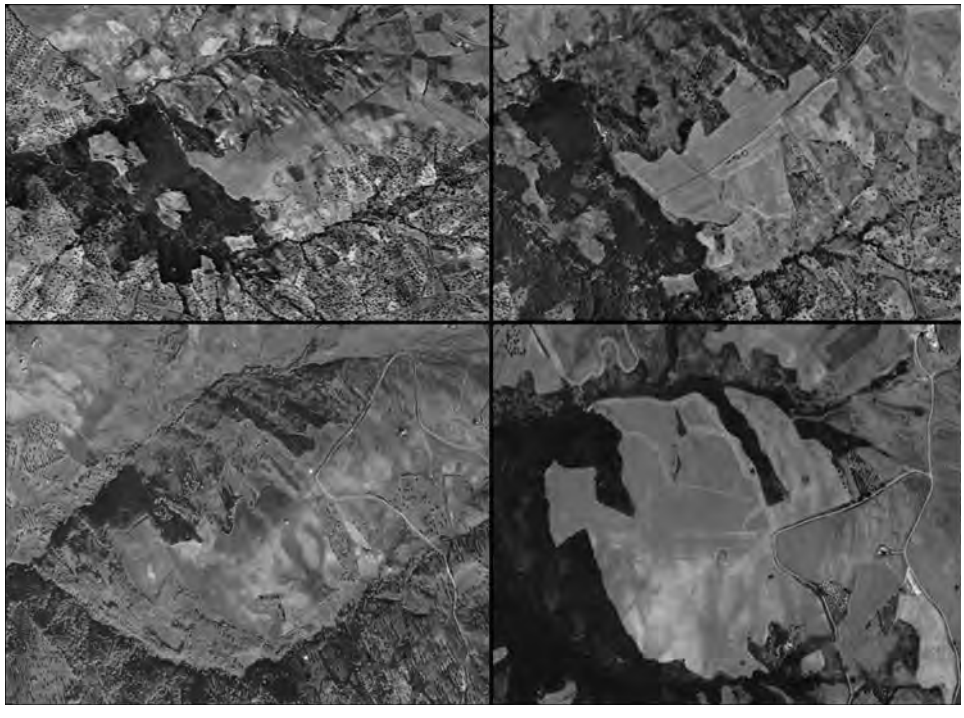

FIG. 9. Sequence of historical photographs: 1953 (upper left), 1974 (upper right), 1980 (lower left), 2014 (lower right). Courtesy of the *ICCD* Rome.

kinds of erosion processes caused among other things by the natural properties of the landscape and by human agricultural activities.[1] The impact of these factors on scatter formation can be understood effectively through aerial photography analysis. For example, the micro-relief of the Allamprese hill could be reconstructed by combining historical images and new high resolution drone images processed with photogrammetric software. The thus created terrain model served as the basis to analyse erosion processes in a GIS environment.

The historical images provide also important information on landscape transformations in this area over the last 60 years (FIG. 9). By analysing the field boundaries across time one can clearly see how the need for arable land has led farmers to push the edges of fields tight against wooded areas or how geological depressions have been filled in order to create more gentle slopes. Moreover, the images also provide important clues for understanding the morphology and location of identified shard scatters. For instance, the study of the 1980 aerial photographs shows there is a clear correlation between erosion gullies, visible as dark bands on the southern slope, and the recorded contour lines of ceramic scatters (FIG. 10). Likewise, the abrupt ending of the site halo to the north is explained by a terrace wall which blocked the down-hill erosion of archaeological material. The terrace wall was removed somewhere after 2002 and now only a

[1] Cf. the various contributions in FRANCOVICH, PATTERSON 2000.

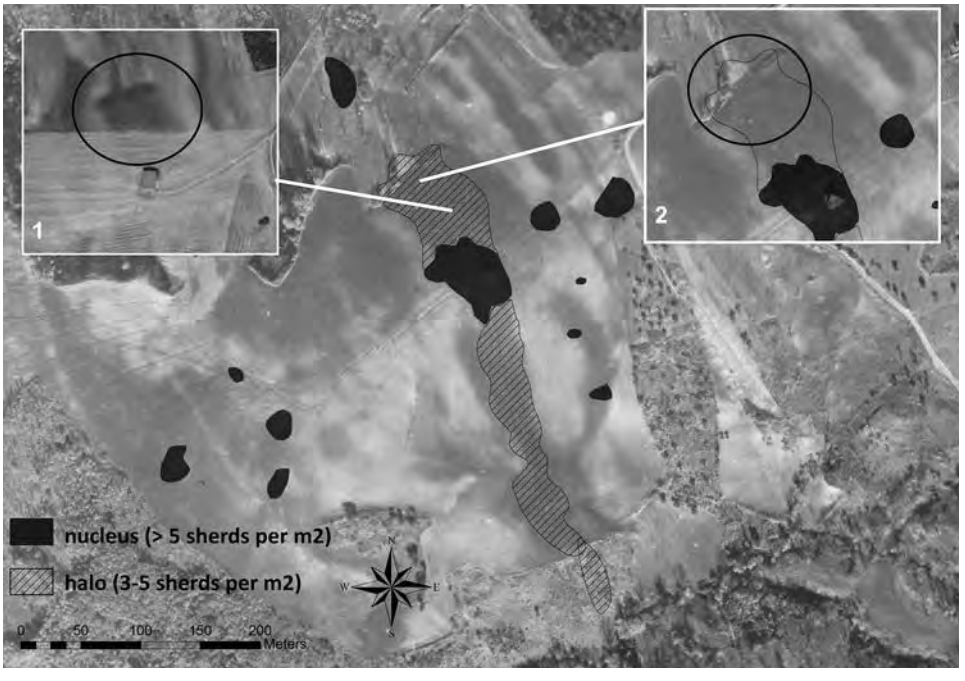

FIG. 10. Site's and site halos mapped by the *LERC* team and plotted on the aerial image from 1980. In the upper right corner (2) a cut out, showing the presence of a terrace wall. In the upper left corner (1), the same area on a satellite image of 2009 which shows that the terrace wall was demolished by that time. Only a dark brown soil trace remains.

dark coloured band remains visible on aerial images. These examples show how complex and stratified a landscape of this kind can be, and at the same time, reveal how lines or alignments in aerial photographs can easily be misinterpreted if not approached in a systematic and comparative way using the critical integration of different sources of information.

Notwithstanding the recent dynamic history of the Allamprese site it was possible to detect several interesting crop and soil marks which seem to be unrelated to recent agricultural activities (FIG. 11).[1] Most significantly, faint traces of an orthogonal field system could still be identified. The grid has an almost exact north-south orientation (-3.3 Est) and a c. 40 meter spacing between the horizontal lines and c. 211 m. between the vertical ones. The orientation of the grid is unrelated to modern field systems on the hill top, but corresponds with a predominant field system orientation in the wider region.

FIGURE 12 shows the four most recurrent orientations of field systems in the Venosa area, one of which (class A) has exactly the same north-south orientation (-3.3 E).[2] It is tempting, but at the same time dangerous, to interpret these lines as reminiscences of

[1] Especially on the (near infrared) images taken with the UAV.

[2] A comparable grid has been identified by our research in the Casalini area.

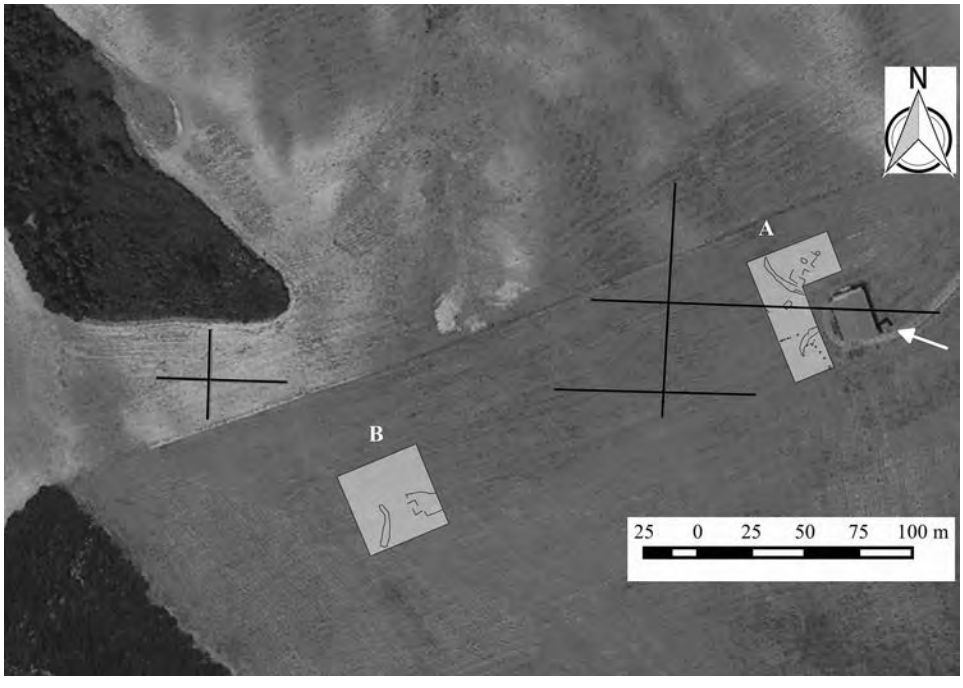

FIG. 11. Lines: interpretation of the soil and crop marks identified on the Allamprese site. A and B: magnetic gradiometer survey areas.

an ancient field division system.[1] In fact, some scholars have indeed suggested that the recurrent north-south field orientation in the Venosa area with a recurrent spacing of 200 to 210 meters between lines might go back to an early Roman field system.[2] It is true that ancient field systems with an interval of 200-210 meters have been identified in the nearby territory of *Metapontum*.[3] In this case, the distance between these lines has been interpreted to reflect a module of 7 Attic *plethron* and the whole system has been dated to the 5th century BC. The same distance also corresponds to 6 Roman *actus*, which would fit more easily with the hypothesis that these lines belonged to a Roman land division program.[4]

On the other hand, it is clearly documented that more recent land reclamation projects and deforestation activities of the 18th and 19th century (FIG. 13),[5] also used

[1] For a recent study on methods to study and interpret centuriation patterns see for example DALL'AGLIO 2004 and DALL'AGLIO 2010.

[2] CATIZZONE, GIUSTESCHI, COPPA 1979; COPPA 1979. More cautiously, MARCHI 2010b, for the Piano di Camera area, based on the distance between discovered Republican sites.

[3] CARTER 2006, pp. 91-132; CARTER 2011; PRIETO 2011.

[4] In fact, in the nearby Latin colony of *Luceria* part of the ancient land division grid has been recognized with a spacing of c. 630 meters, which has been interpreted as matching 18 *actus* (SCHMIEDT 1985). See, however, MANACORDA 1991 for an alternative interpretation. He suggests the grid is based on the *vorsus*. Also CHOUQUER *et alii* 1987, pp. 142-143 recognized a similarly spaced grid in the territory of *Aesernia* (Grid 1, with a module of 6×12 *actus*) which they date with some reservation to the foundation of the colony in 263 BC.

[5] TICHY 1962; SALVATORE 1984, pp. 12-15.

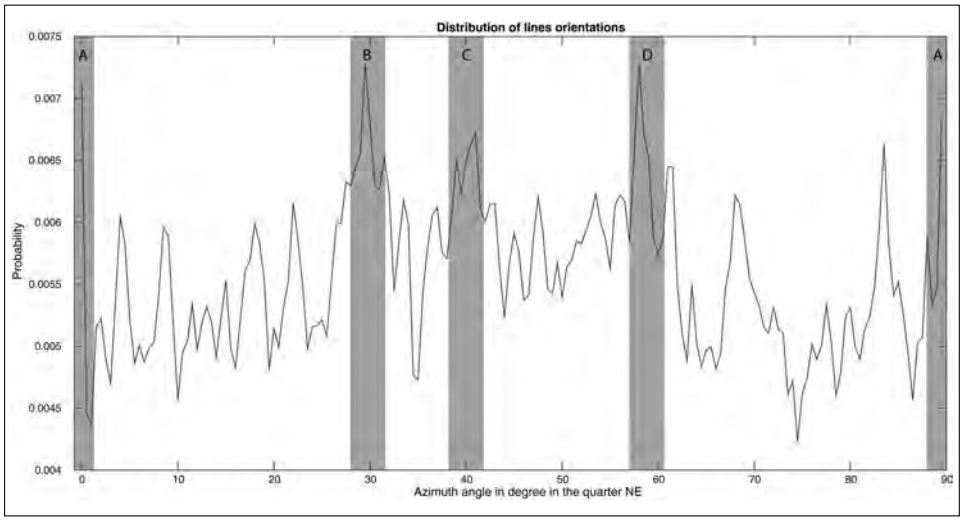

FIG. 12. Graph showing the orientations of the field division systems in the territory of Venosa.

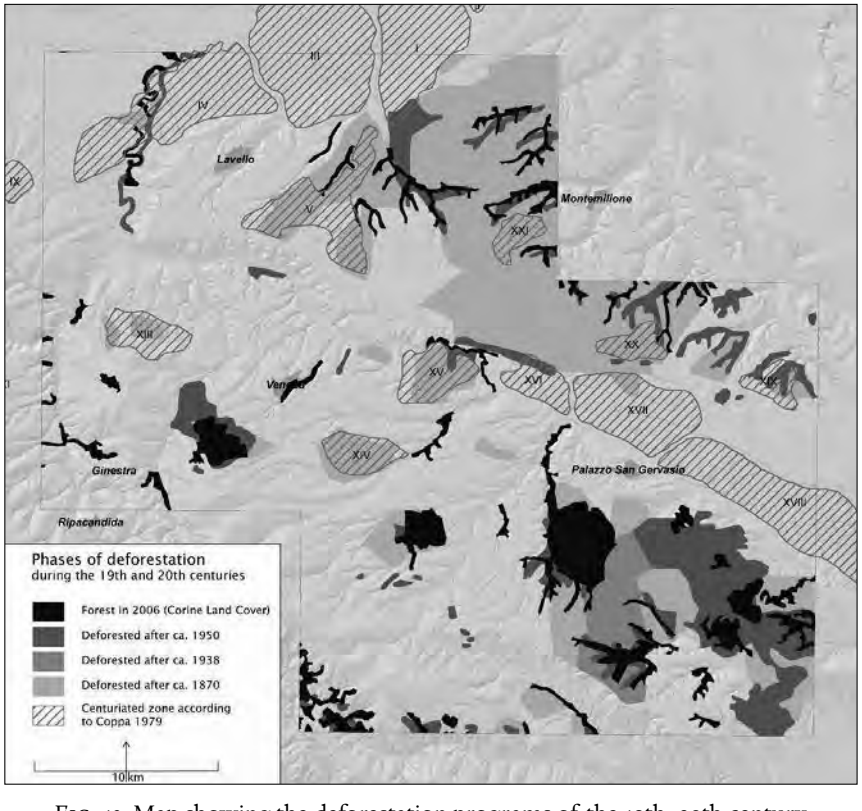

FIG. 13. Map showing the deforestation programs of the 19th-20th century (forest data from TICHY 1962) and the areas of centuriation according to COPPA 1979.

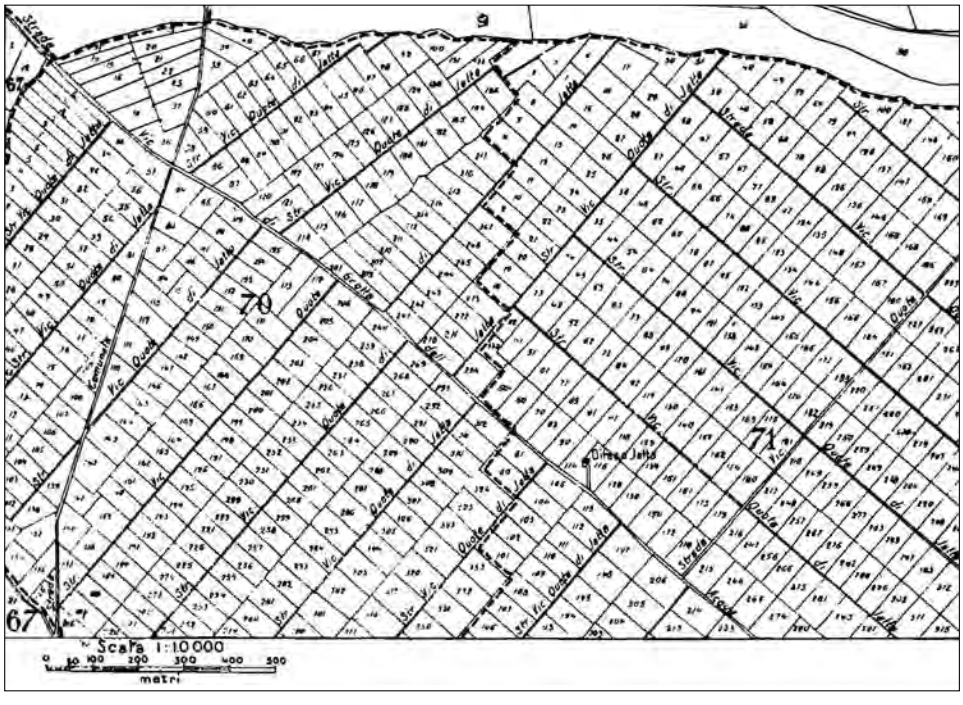

FIG. 14. Cadastral map of 1911, showing the field division grid in the deforested area called Bosco di Jatta.

regularly spaced north-south field division systems with recurrent 200 to 300 meter spacing between division lines. For example, a clear north-south orientated grid was created in the late nineteenth century in the area called Difesa di Messere (southern part of area V on FIG. 13). In Bosco di Jatta, to the north of Venosa, on the other hand a grid was created with a NW-SE orientation of which the main axes are spaced at 200 × 40-50 meter intervals (FIG. 14, and FIG. 13 area XIV for its location), thus delineating allotments of 0.4 to 0.6 hectares. These measurements correspond closely to those recognized on the Allamprese site. Considering this evidence it would be unwise to connect the discovered field division lines to a Roman land division program. The area has known a long and dynamic agricultural history in-between the Roman period and the 1950s, and any of these interventions can have been responsible for these traces.[1]

In an attempt to enhance our understanding of both the traces recognized on aerial photographs and the artefact scatters mapped on the surface, we did a small magnetic gradiometer survey on the site. As the geology and geomorphology of this area is not ideally suited for this type of research, the main aim of this research was to test the potential of this technique in two small sample areas (FIG. 11).[2] The results in the core of

[1] In general on the more recent agricultural history of this area see PEPE 2005 and FUCCELLA, LABELLA, LAVORÀNO 2010.

[2] With 8 (20 × 20 m sides, with $\Delta x = 1$ m & $\Delta y = 0.25$ m. sampling resolution) grids in total: 4 grids in a 'L' shape around (north-western edges) the stor-

the settlement (area A) were heavily influenced by the presence of a modern storage house nearby. Nevertheless, a number of interesting features are visible in the northern part of the sample area (Fig. 15a). These do not have a readily recognisable outline, but in terms of their magnetic signature seem to indicate anthropic activity. The position of isolated monopoles in the southern part of the sample area may tentatively be interpreted as some sort of fencing, which, however, may relate to interventions of any time period. The results in area B were equally difficult to interpret (Fig. 11). At the same location where the field survey had mapped a high density of artefacts, the magnetic survey data shows an area measuring c. 10 × 13 meter with a distinctive signature, potentially indicative of human activity (Fig. 15b). The quality of this data does not, however, allow any further speculation on the functional and chronological identification of this feature. On the basis of these overall problematic results, it was decided to suspend the geophysical survey for now.

Settlement dynamics and the impact of Roman colonization

Our research thus confirms the presence of a large nucleated settlement in the Allamprese area. Yet, the detailed study of the BG pottery shapes and distribution patterns provided important new insights into the chronological development of this site during the Hellenistic period, and into the issue of discontinuity of occupation of the site between the pre-colonial and colonial periods. Both the conventional chronology of Morel and the revised ones based on the new and better dated parallels from the region (Fig. 16) show that a considerable percentage of BG pottery collected on this site dates from the second quarter of the third century BC onwards; thus well after the settlement of the Latin colony in the Venosa area in 291 BC (e.g. Morel 44%, which rises to 55% if we accept the new chronologies).[1] Both types of analyses do, however, suggest different periods of steep decline of BG pottery consumption. While Morel's chronologies suggest this occurred in the first quarter of the 3rd century BC, thus contemporaneously with the foundation of the colony in the territory, the new chronologies suggest a less marked drop, and that this decrease only started a generation later in the period 275-250 BC.

Moreover, it is important to realise that the marked decline of BG consumption in the third century BC is not specific for Allamprese only, but reflects overall patterns of BG consumption and production in the wider region (Fig. 17).[2] This might be partly connected to changing pottery demands and supplies, and thus is not necessarily indicative of a corresponding decrease of human activity on the site.[3] The fact that in respect to the Italian mean, a higher percentage of the Allamprese BG pottery has a chronology in-between 275-200 BC is significant and tentatively suggests that the community living on this site thrived in this period. It is also telling that the spatial distribution pattern of the BG pottery datable to the third century BC (Fig. 18b) is comparable to that recorded for the pre-colonial phase (Fig. 18a). Such a pattern fits therefore more comfortably within a scenario of relative settlement continuity (albeit perhaps on a less intensive

age house (covering the *LERC* site ID AL02 – *Ager Venusinus* site number 501); 4 grids for the *LERC* site ID AL03 which corresponds roughly to *Ager Venusinus* site number 499.

[1] The BG trends based on the chronologies of Morel were achieved by using weighted average values. On this method see Di Giuseppe 2012, pp. 11-12, with further references.

[2] Di Giuseppe 2012, pp. 115-157.

[3] Di Giuseppe 2012, pp. 18-19 with further references.

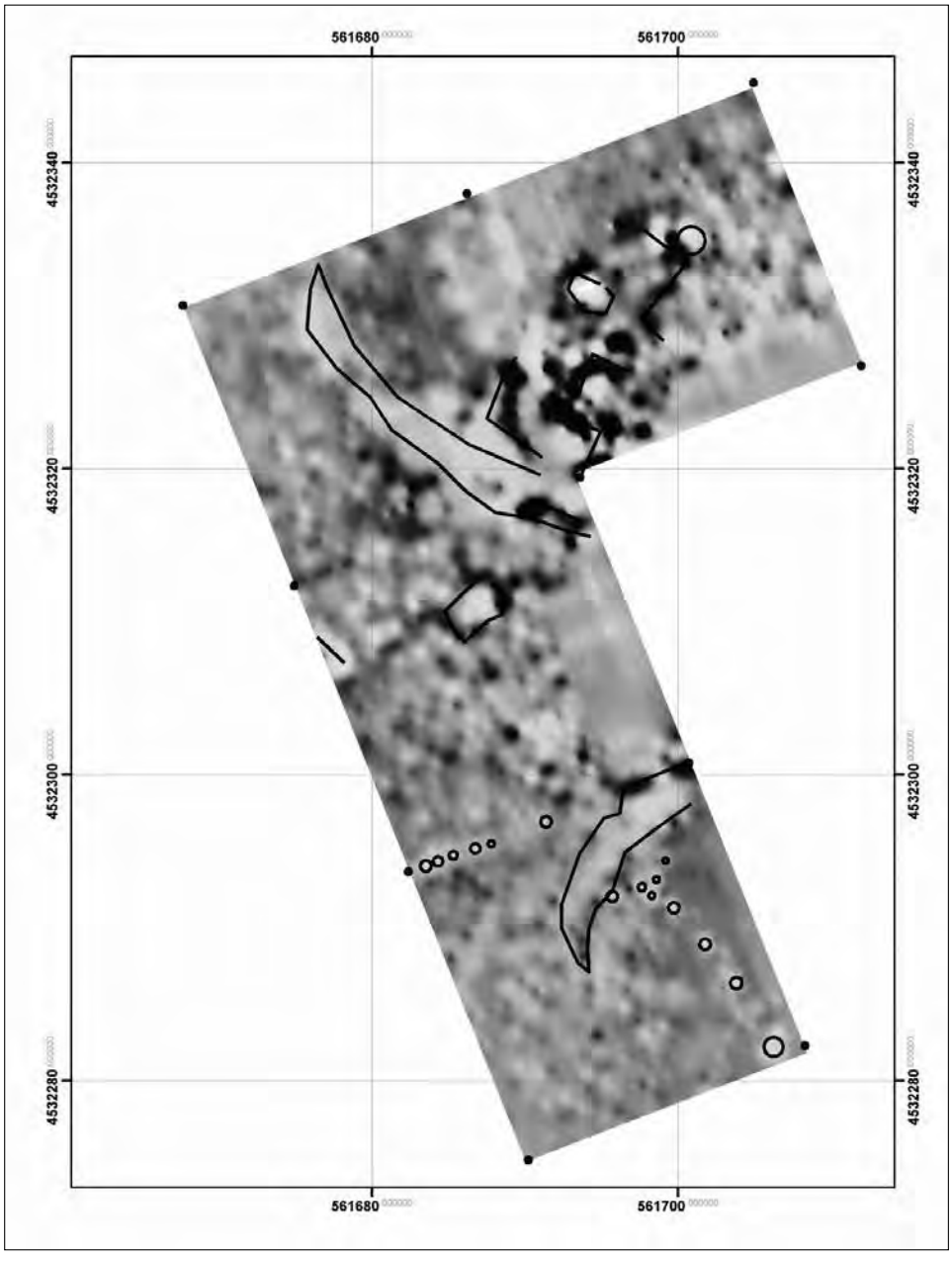

FIG. 15a. Results of the magnetic gradiometer survey. Area A.

scale), than with a model of abandonment of the pre-Roman village, related to the radical reorganization of settlement in this area as a result of the colonial foundation in the area.

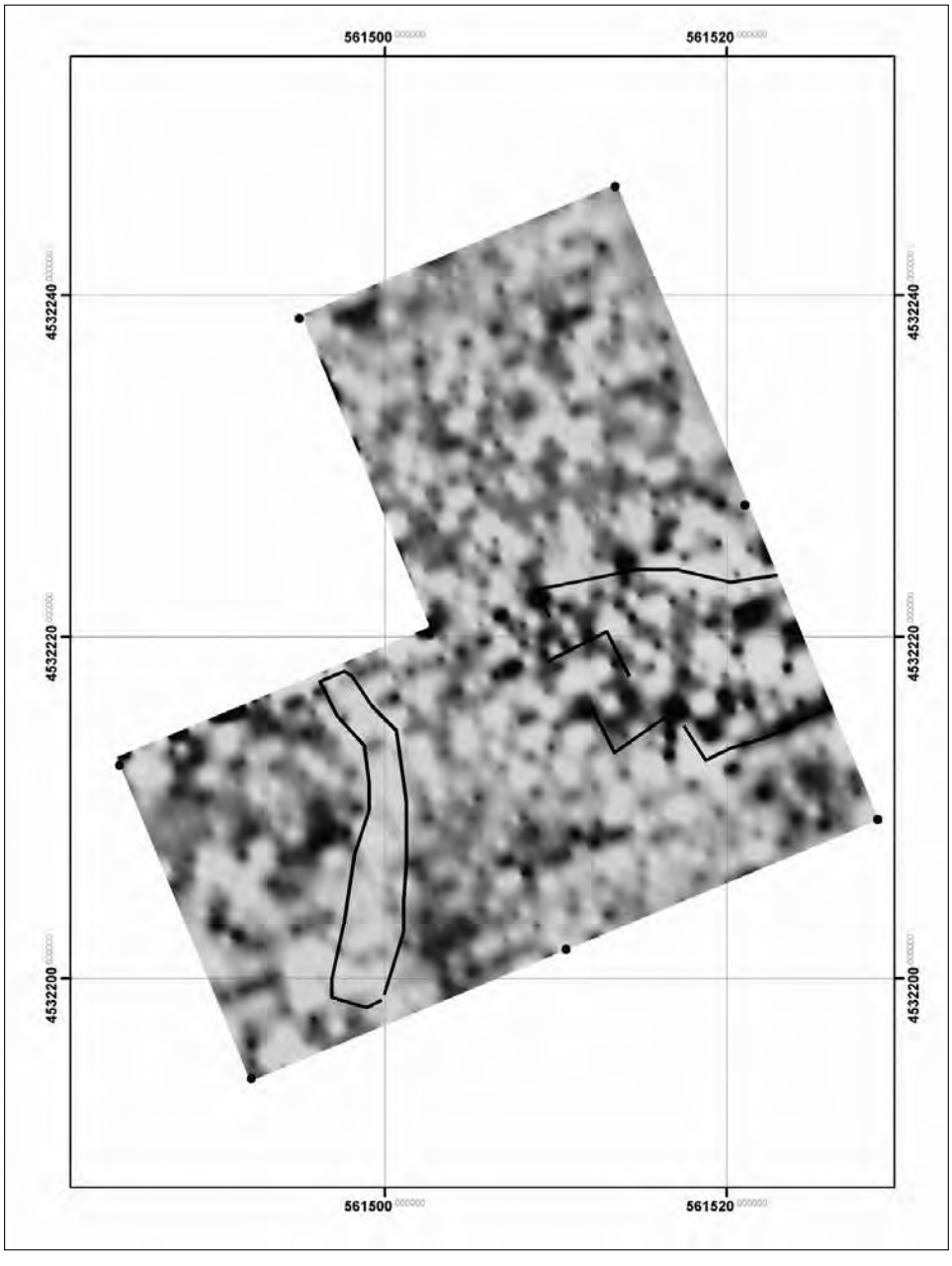

Fig. 15b. Results of the magnetic gradiometer survey. Area B.

Another interesting trend is the small peak in BG consumption in the late 2nd century BC (Fig. 16). This moderate recovery is not restricted to the Allamprese site, but is typical for the wider Venosa area and has been connected with the arrival of new set-

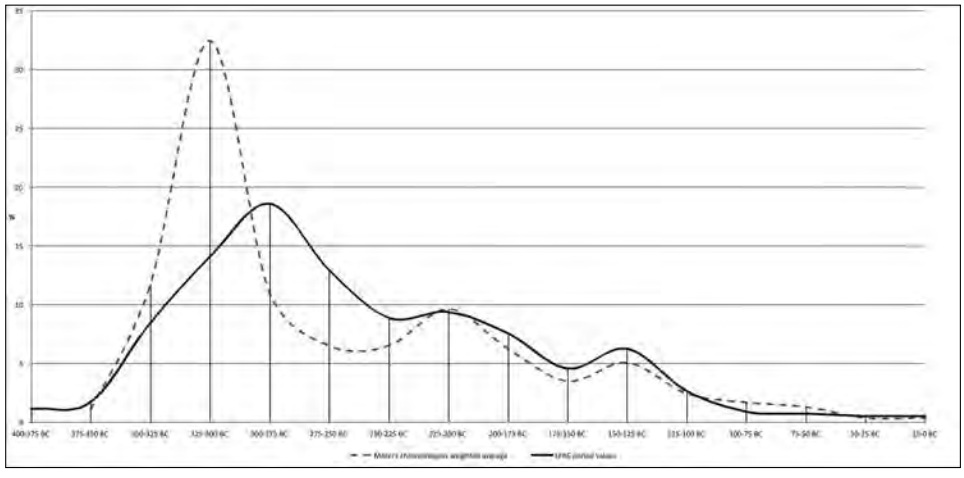

FIG. 16. BG pottery consumption trends on the Allamprese site.
The graph shows both the weighted averages of Morel's BG chronologies (N = 133) and the *LERC* unequally distributed period values (N = 136).

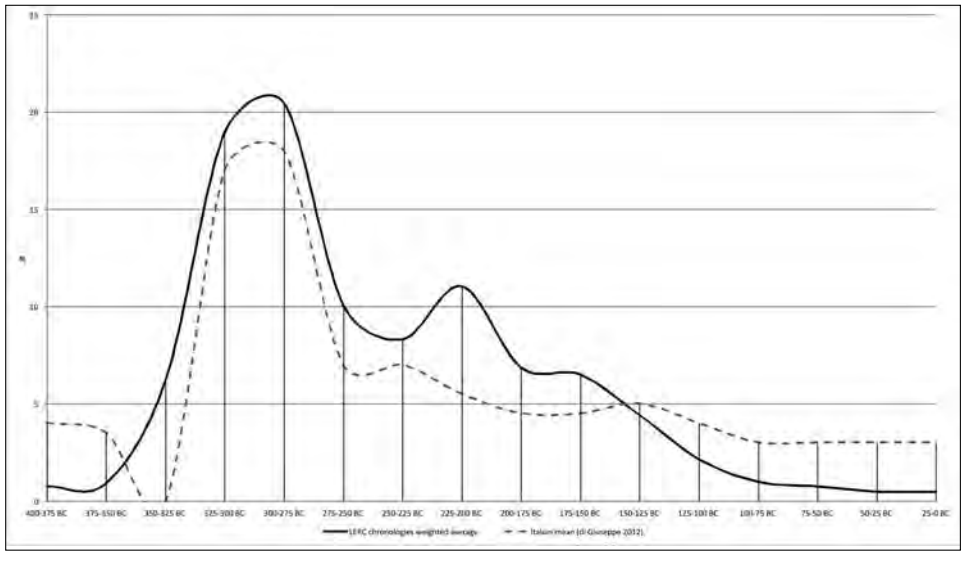

FIG. 17. BG pottery consumption trends on the Allamprese site.
Weighted averages of *LERC* chronology (N =136) compared to the Italian mean (N = 27,293).

tlers in this period as part of the Gracchan land distribution program.[1] Yet, even though the second century BG types have a more reduced dispersion, they too occur in the iden-

[1] *Lib. col.*, I, 210, 7 (Lach.) and *Lib. col.*, II, 261, 19 (Lach). Cf. MARCHI 2010b, p. 17; DI GIUSEPPE 2012, p. 126. Our data does not suggest a revival at the start of the second century when new colonists were recruited (e.g. LIV., XXXI, 49).

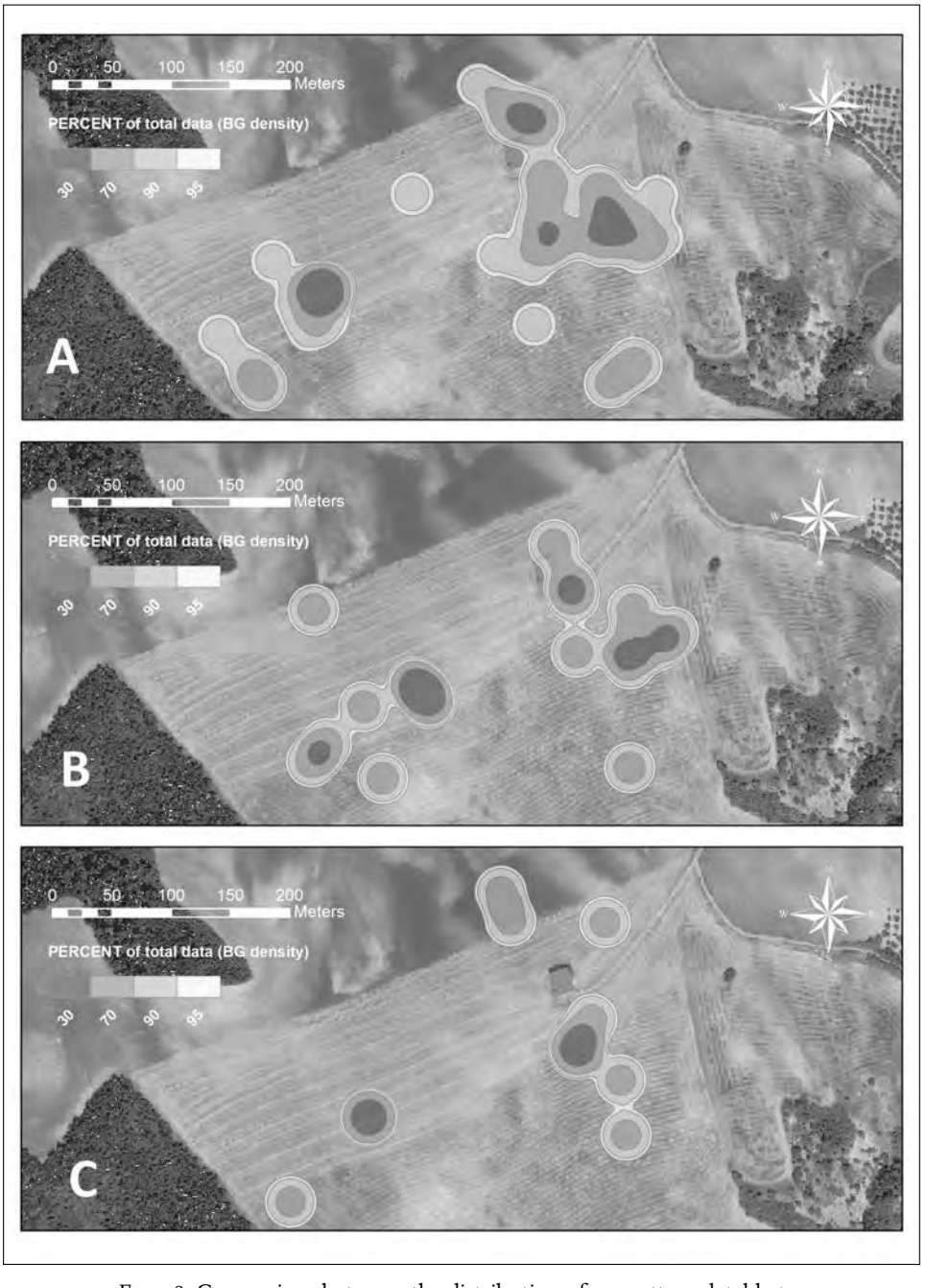

FIG. 18. Comparison between the distribution of BG pottery datable to:
a) 350-275 BC, b) 275-200 BC and c) 200 - 125 BC.
For the interpolation a kernel method was used with a search radius of 30 m.
The densities represent Percent Volume Contours,
which is a method to display the % of a cumulative distribution.

tified settlement nuclei, which again suggests that at least the two cores of the settlement persisted in the second century BC (FIG. 18c).

CONCLUSION

The preliminary results of the new research at the site of Allamprese seem to strengthen the recently proposed hypothesis that nucleated rural settlements played a more important role in mid-Republican Roman colonial territories than previously has been assumed. Whereas in earlier studies the establishment of the colony has been expected to strongly disrupt existing settlement patterns, and that especially village-type settlements disappeared, the case of Allamprese does point to continuity of the settlement in the early phase of the Latin colony. The potential broader significance of these preliminary findings still depends on many factors, and needs further research. A crucial next step is to establish whether Allamprese is an exceptional case, or that the here detected pattern extends further also to other nucleated rural sites. However that may be, the case of Allamprese is a useful reminder of the importance of constantly reassessing settlement models in the light of new methods and insights, and demonstrates the value of the integration of different data-sets, old and new, geared to new research questions.

Acknowledgements

This paper is the result of the close collaboration of different researchers and institutes. The project is part of the larger research project *Landscapes of Early Roman Colonization* which is financed and co-organized by the Dutch Research Council (NWO), Leiden University (director: T. D. Stek) and the Royal Netherlands Institute in Rome (co-director: Jeremia Pelgrom). The research in the Venosa area was coordinated by Jeremia Pelgrom in close collaboration with Maria Luisa Marchi, who kindly gave us access to the *Ager Venusinus* data (pp. 33-36), Antonio de Siena (director of the *Soprintendenza dei Beni Archeologici della Basilicata*) and Tesse D. Stek. Responsible for the analysis of the aerial photography is Gianluca Cantoro; the geophysical prospection was conducted by Gianluca Cantoro and Apostolos Sarris (pp. 38 and 45-47); the study of the Black-Gloss pottery by Lucia Lecce (pp. 39-43) and the study of modern field divisions by Arthur Hamel (pp. 48-50). The team leaders in the field were Anita Casarotto and Jesús García Sánchez, who also did most of the GIS analyses (pp. 43-45). We thank the other survey team members: Frank Beijaard, Annachiara Fiore, Mike de Heij, Kristel Henquet, Stefan Kooi, Bianca Olteanu, Niels Stoffels, Ivar Svensson, and Ties Verhoeven. We are also grateful to Tonia Giammatteo, the staff of *Museo Archeologico Nazionale di Venosa*, the *Istituto Centrale per il Catalogo e la Documentazione* (*ICCD*) in Rome and of the *Istituto Geografico Militare* (*IGM*) in Florence for their kind assistance. Finally, we sincerely thank the communality of Venosa for their warm hospitality.

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