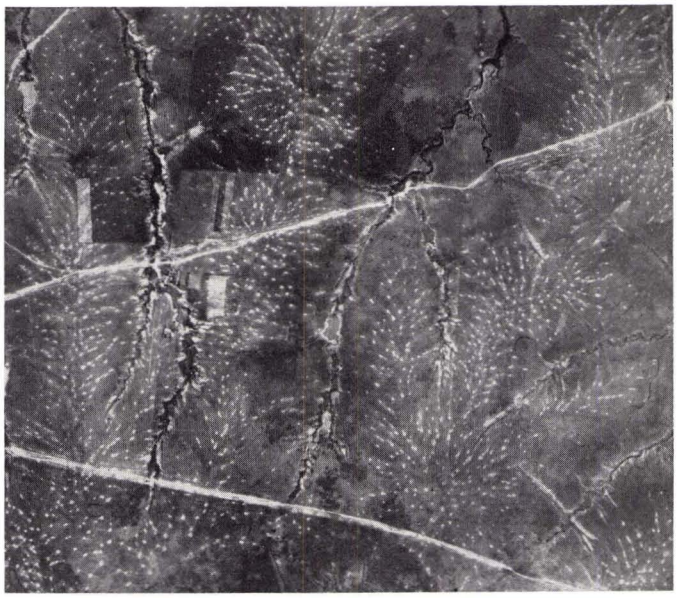

FIG. 1. Portion of an aerial photograph (at reduced scale) showing anthill sites on an Argentine study unit of 2,300 hectares. Anthills show as white dots, often arranged in radiating or "herringbone" patterns.

M. P. MEYER*
E. J. WOOLFOLK
UNDP, FAO-INTA Proj. 186
Concepción del Uruguay, Argentina

Anthill Infestations

An airphoto mensurational technique for assessing forage losses on grazing lands due to ant activity.

(*Abstract on next page*)

INTRODUCTION

A COMMON GRAZING land-management problem in many parts of the world is loss of herbage to ant colonies. Such losses usually take two forms: (a) space occupied by anthills, and (b) plant material harvested in adjacent vegetated areas.

Reliable quantitative measurements of actual herbage losses due to ant depredations are extremely difficult to perform and, consequently, are seldom attempted. Despite the lack of practical, reliable methods for evaluation of vegetation losses of this type, there is, nevertheless, every reason to believe that the degree of removal of grazable herbage by ants is sometimes extremely serious.

As anthill infestations in portions of Corrientes Province in Argentina tend to be particularly common, a study was organized for the purpose of finding possible practical methods of assessing the comparative effect of ant colonies upon herbage production. This paper presents the method developed and the results obtained in the first phase of the study

* Photo Interpretation Specialist and Project Manager, respectively. Published as Paper No. 6135, Scientific Journal Series, Agricultural Experiment Station, St. Paul, Minn. Dr. Meyer is currently Professor of Forestry, University of Minnesota.

(i.e., calculation of ground surface removed from vegetation production due to actual anthill-site occupancy).

Infestation Area

The study area is covered by 1:30,000-scale panchromatic photography which shows the anthill sites as white dots arranged in interesting patterns radiating out from points or lines of high ground (Figure 1). The significant relationship of the infested areas to the local drainage pattern is dramatically illustrated in Figure 2.

Once the infested area had been delineated, a dot grid was employed to determine the respective land surface areas of the gross study unit and that portion of it considered to be anthill-infested. The dot grid had an equivalent of 1 dot equal to 1.44 hectares at a scale of 1:30,000, and indicated the gross study unit to be 2,300 hectares (5,683 acres) in size, of which 1,360 hectares (3,360 acres) were anthill-infested.

Anthill Density

A dot grid transparency having dots at a 200-meter interval spacing at photo scale was fastened over the aerial photo of the study unit. Next, a 1:30,000-scale film transparency bearing a 1-hectare plot was superimposed over each grid dot situated inside the infested area. Only plots falling completely inside the infested area were used—all plots whose boundaries extended outside the infested area were discarded.

A total of 790 anthills was counted on the 305 plots classified as usable, indicating an average density of 2.59 anthills per hectare (approximately 1 anthill per acre) in the infested area.

Abstract: *Although grazing land forage losses due to ant infestations are seldom calculated due to high cost and problems of technique, they are estimated to be extremely high. The actual forage growth area loss due to anthill occupancy of a study area in Argentina was determined through the use of measurements of infestation area, anthill density and anthill diameter on 1:30,000 scale aerial photographs. A total of 121 hectares (299 acres), or 8.9 percent of a total area of 1,360 hectares (3,360 acres), was found to be physically occupied by anthills.*

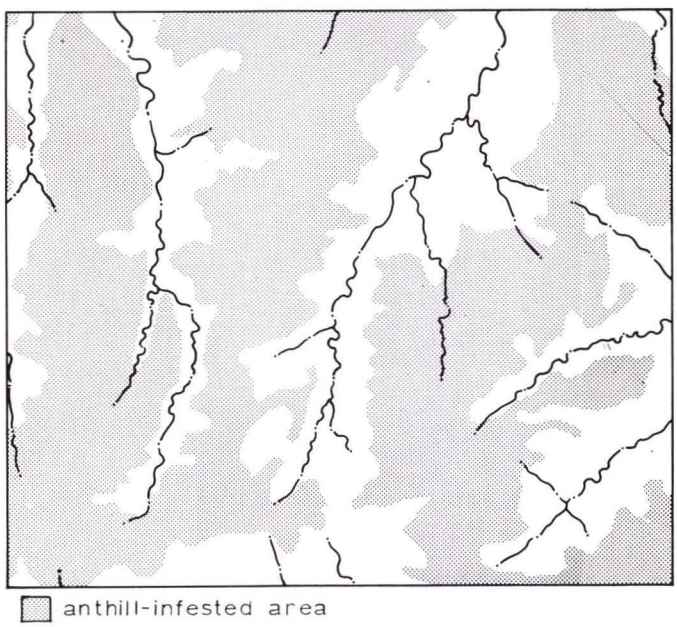

Fig. 2. Diagram of anthill-infested area illustrating relationship of anthill sites to drainage systems.

Individual Anthill Area

Several dozen anthills from representative portions of the infested area were selected and their diameters measured on the photo with a fractional millimeter scale. Average hill site diameter (on the photographs) was found to lie between 0.65 mm and 0.70 mm—i.e., approximately 20 meters ground distance at photo scale.

This is *not* to suggest that the average anthill was approximately 20 meters in diameter! The average anthill site, which is portrayed as a white dot or irregular blob on the air photos, includes both the mound and a peripheral zone around the mound which is also devoid of vegetation, or nearly so.

Summary and Conclusions

Based upon the photo analysis of the study unit, 121 hectares (299 acres) were judged to be physically occupied by anthill sites at the time of photography. This means that 8.9 per cent of the anthill-infested area of 1,360 hectares (3,360 acres) was completely out of production! Add to this the (as yet) undetermined ant-harvest of vegetation beyond the anthill sites, and some idea of the enormity of the loss of livestock forage over the study unit as a whole becomes apparent.

Also apparent is the utility of quite ordinary natural-resource aerial photography for such a unique assessment purpose. The cost of a similar survey by ground methods would have been prohibitive in time, field expenses, and manpower, and it is doubtful whether, regardless of the resources allocated, any better situation analysis would have resulted.