

## ANIMAL TRACTION USING BUFFALOES IN SMALL BRICKYARDS

Pimentel, G.B.M. &amp; Reis, A.F.S.

Brazilian Agricultural Research Organization (EMBRAPA),  
Agroforestry Research Center for the Eastern Amazon (CPATU),  
Belém, Pará, Brazil**INTRODUCTION**

Small brickyards use human force as a main power source which process is slow and expensive, because labour has a high participation in the production costs in these industries. Animal traction using buffaloes can be an alternative way, which can be transferred to small producers, to change this process increasing production in about six times, with the costs only three times higher when compared to the manual system changing the present socioeconomic reality and fixing people in the rural properties.

**MATERIAL AND METHODS**

The small brickyards studied are located in Curuçá, Pará, Brazil. Their production output cannot supply local necessity, as well as it is not profitable for their owners. The income which is obtained was only enough to pay the workers, although that did not represent a legal minimum salary for the employees. The evolution of the production is limited by problems of transportation of the clay from the mine to the installations of the small brickyards, which is done using a wheel barrow, and by the process of making the mass homogenous by the mixer, where the power of six men was necessary to start it in the system of Atafona (similar to an animal traction device). Therefore, the animal traction was introduced aiming to reduce these problems. The animal used was a four-year old buffalo, with approximately 700 kilos. For a better operation of the small brickyards, the transportation of the clay was done during the mornings and the mixer operation was left to be carried out during the afternoons. This procedure was adopted because the animal, which is rested in the early mornings, is more capable to work larger loads; in the afternoon, when the temperature is normally higher, it works in covered environments, protected from the sunlight and submitted to less efforts. The clay mine is approximately 110 meters away from the small brickyards facilities, and the transportation of the material is normally done using a trawling wooden sled.

**RESULTS AND DISCUSSION**

The study was carried out during two days. It was calculated that 4,704.25 kilos of clay were worked by traction after finished courses, on which the animals developed potency which varied from 1.64 to 3.61 HP. Success in a commercial enterprise exists when economic effects of a time period,

Index terms: Amazon, cost of animal draw, small industry,  
animal drawf.

which is the result of the exchanging relationship between the business and the consuming market, are enough to cover all expenses, to reward deservedly the undertaker, to keep the level of the productive potential and to present the socially beneficial repercussion for the community to which it belongs. In Table 1, the economic results are presented to illustrate the introduction of technology, increasing the productivity of the rural enterprise. Thus the use of one or two animals in small brickyards may represent profit for tile produces, while the manual system, may present deficits.

TABLE 1. Income, cost and profit of a small rural brickyard in the production of tiles under different systems

	Labor System		
	A-Manual	B-Use of one animal	C-Use of two animals
Market value/tile US\$ 1.00	0.12	0.13	0.13
Level of production and sell (tile)	2,000.00	8,000.00	12,000.00
Total in come US\$ 1.00	260.00	1,040.00	1,560.00
Fixed cost US\$ 1.00	338.00	953.00	1,028.75
Variable cost US\$ 1.00	9.90	5.00	19.65
Total cost US\$ 1.00	348.00	968.00	1,048.40
Profit US\$ 1.00	-88.00	+72.00	+511.60

The fulfillment of a small brickyards depends basically on the quality of the employed human labor (1). Usually, in the country side of the state, there is no qualified human labor available to non-agricultural or cattle-raising activities. Therefore, the income of the small brickyards is low, as it is shown in the Table 1 (2,3). The income increases when one or two animals are used (lines B and C of Table 1) in the heavier jobs, leaving the lighter jobs for man power. Another factor that influenced enormously the productive sector of the small brickyards was the synchronism of the various operations,

so that one unity of this whole process did not present neither idleness, nor excess of activities.

#### REFERENCES

- (1) Mialhe, L.G. **Manual de mecanização agrícola**. São Paulo: CERES, 1974. 301p.
- (2) Ferguson, C.E. **Microeconomia**. Rio de Janeiro:Forense, 1982. 608p.
- (3) Produtividade máxima e produtividade máxima econômica. **Informações Agronômicas**, Piracicaba, n.45, p.1-2, 1989.