Exploitation Enhancement of Buffaloes Manure Application *vs* Conventional Cultivation in Intensive Two Forage Cropping Models per Year--Results on Agronomic Purposes

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Introduction Dairy farming is a successful economy activity in the agricultural sectors in terms of agronomic and livestock productivity , use of agronomic inputs and equipment technology in farming management . However , derived waste product of husbandry activity , mainly manure , represents an undesirable product which jeopardizes the environment making soil and air pollution . Therefore , the use of manure in cropping management performed on agronomic use allows the opportunity to increase the flow of nutrient cycling in farms and consequently decoupling livestock and crop production . Mixed farmers agronomic management of the livestock manure may provide the challenge to recycle waste as nutrient plant reducing the chemical fertilizers and increase soil organic carbon of Ap horizon . This experiment aimed at to compare the utilization of buffaloes liquid manures fertilization with conventional chemical fertilizers in cropping forage crops model (autumn-winter and spring-summer double year) on productivity of crops , soil fertility and sustainability of the cropping system .

Materials and methods The experiment was established in 2006 and it isstill in progress at Monterotondo (Longitude 12° 37′E , Latitude 43° 3′ N and 23 m above see level) .The experiment is carried out in a mixed farms of the Istituto Sperimentale per la Zootecnia of Roma based on four models of forage crops grown in double crop cycles per year : autumn-winter and spring-summer crops growing under irrigated condition . The experiment is arranged in a factorial arrangement with three factors : manure applied before seeding ; manure spread before seeding and at the beginning of stem elongation ; and conventional fertilization . Each factor considers four levels of crops .

Results and discussion The crops evaluated in the models (Table 1) are strongly affected by experimental treatments . The effect of both manure treatments favoured the increase on dry matter production over conventional cultivation in winter crops (14 .8% in ryegrass and 9 .8% in barley) and spring (26 .2% in corn , 12 .7% in forage sorghum and 17 .8% in seed sorghum) , and did not affect moisture content at harvest . Winter and spring manure applications compete with nitrogen fertilizers .

Results evidenced that manure application may substitute the conventional fertilization without reduce dry matter crops production . The benefit of manure application in comparison to the conventional fertilization is evident . The one run manure application in comparison to the conventional fertilization favour biomass production in both harvest of the cultivated crops .

Table 1 *Dry matter and moisture at havest of the corps under manure and conventional cultivation .*

Crops	Manure one application (M)		Manure two applications		Conventional (C)		LSD 0.05
	Dry matter	Moisture	Dry matter	Moisture	Dry matter	Moisture	Dry matter
	t ha^{-1}	(%)	t ha^{-1}	(%)	t ha^{-1}	(%)	M *vs* C
	Winter - Spring growimg						
Ryegrass	10.57	79	9.1	78	8.38	79	*
Barley	14.86	61	14.23	60	13.13	59	*
Faba bean	11.14	83	11.82	82	10.07	83	NS
	Spring - Summer growimg						
Corn	25.18	72	19.68	75	19.76	74	*
Forage Sorghum	17.42	77	18.85	77	15.82	77	*
Seed Sorghum	6.5	76	10.44	76	6.96	76	*
Lucerne	11.31	75	11.95	77	10.59	77	NS

* and NS = Significanta at P=0.05 propability level and not significant, respectively.

Conclusions Favourable results for applying manure in the cropping system demonstrate that farmers can conveniently use manure to replace fertilizer N for forage grass production . The benefits of the use of manure in dairy farms may improve the ability to comply with tightening environmental constraints and should encourage farmers to utilize manure instead of conventional fertilization in cropping process for producing herbage for animal feeding .