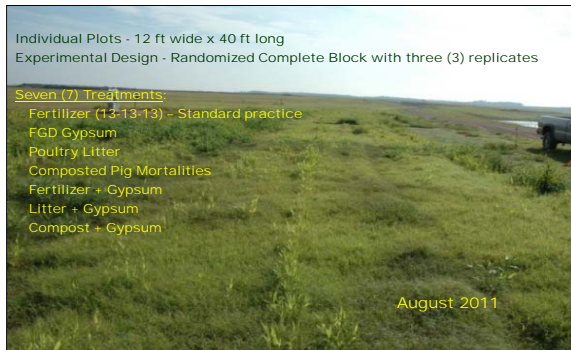
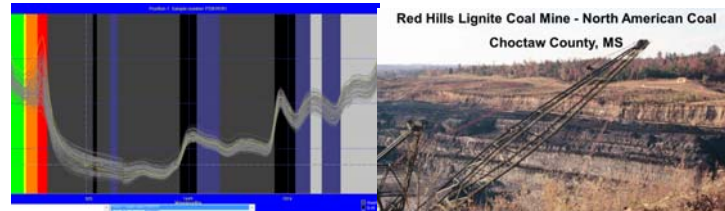




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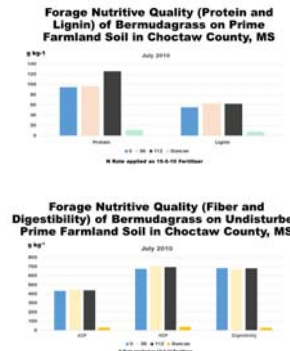
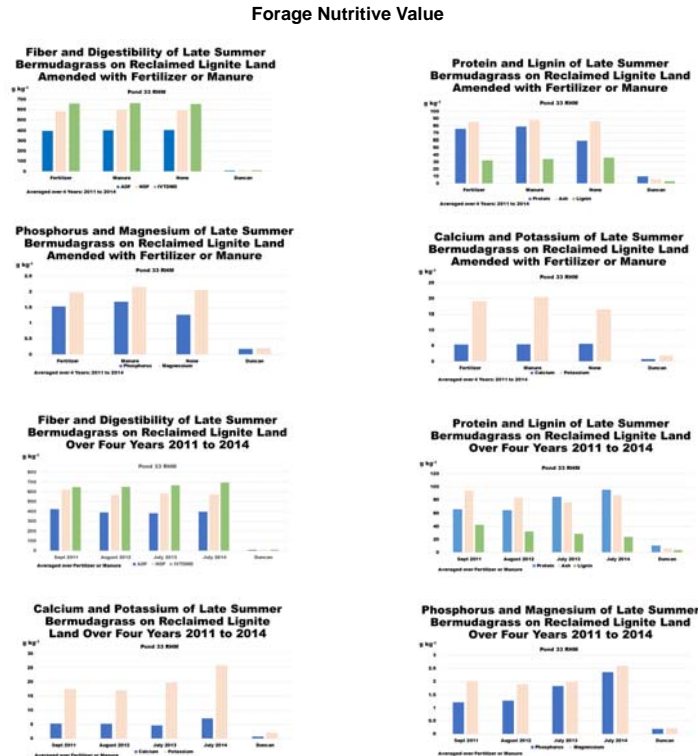
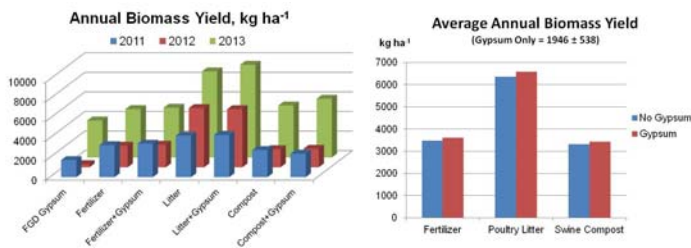
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Organic and inorganic amendments are important to soil reclamation on drastically disturbed mine sites. Improvements in soil physical and biological properties enable increased plant growth, nutrient cycling and soil organic carbon sequestration and consequently, the capacity of reclaim soil to mitigate loss of ecosystem function such as nutrient recycling and other soil microbial processes. The objectives of these studies were to determine uptake of applied nutrients and forage nutritive characteristics in forage biomass (kg ha⁻¹) from summer harvests of bermudagrass (*Cynodon dactylon* L.) in Mississippi. Five treatments of 896 kg ha⁻¹ NPK fertilizer (13-13-13), 22.4 Mg ha⁻¹ poultry litter or swine compost, and litter or compost plus gypsum were split-applied without incorporation in May and August for three years. Repeatedly applying 22.4 Mg poultry litter ha⁻¹ on newly reclaimed mine soils enhanced forage biomass and crude protein (CP) concentration. Two other studies with bermudagrass were conducted on prime farmland, mapped to Oaklimiter (Oa) and Chenneby (Ch) soils, and compared with reconstructed lignite mined soil. Fertilizer (as 15-5-10) was applied to the undisturbed sites at 0, 200 and 400 kg ha⁻¹ after each harvest every 30-40 days. Samples were collected to determine dry matter yield at 55 °C and ground to 1 mm to determine forage nutritive values by near infrared spectroscopy (NIRS) and nine elements by inductively coupled plasma spectroscopy (ICP). Forage yield ranged from 3 to 10.5 Mg ha⁻¹ on undisturbed sites and from 2 to 8 Mg ha⁻¹ on reclaimed land.



Characteristics of three waste materials used as soil amendments.

Material	DM	N	P	K	Ca	Mg	Na	Fe	Mn	Cu	Zn
	%	g kg ⁻¹						mg kg ⁻¹			
FGD Gypsum	94	----	0.1	0.5	152.7	0.4	0.2	0.4	9	4	14
Poultry Litter	81	26.5	16.9	23.4	32.4	5.5	9.3	1.7	503	178	435
Swine Compost	57	13.7	10.7	8.1	20.2	2.9	2.8	1.8	288	53	216



Conclusions

Poultry litter consistently and significantly (P < 0.01) enhanced biomass yield and forage N concentration.

Herbage CP levels were 99 to 115 g kg⁻¹ in reclaimed soil and were similar to CP measured on undisturbed sites of 94 to 117 g kg⁻¹. Uptake of P, K, Ca and Mg in biomass also was similar between sites.

The forage from each site had digestibility levels that exceeded 600 g kg⁻¹, indicating standard reclamation practices enabled productive land for livestock production.

