

Australian Acacias for agro-forestry farming systems in semi arid regions of Africa.

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Communities living in the semi-arid tropics which rely on annual crops or pastures (for livestock) for food, are particularly vulnerable to hunger and periodic famine.



Annual crops are susceptible to regular failure in semi arid climates.

In these regions, certain Australian *Acacia* species have vast, untapped potential as multi-purpose trees in agro-forestry systems. A number of species thrive under adverse conditions where most annual plants struggle to survive. Some of their uses include planting for windbreaks, biomass production for mulch and organic matter, firewood, feed for honey bees, and food for humans and livestock. Being perennial with an established root system, mature acacias can take advantage of rains that would be ineffective for annual crops.



Acacia coleii windbreak in agro-forestry farming system.



Acacia and Millet porridge.

The seeds of these acacia species are tasty, safe to consume and nutritious. They are high in protein, carbohydrates and fats. They are easily harvested and processed into flour using simple and existing local technologies. The flour can be incorporated into local dishes as well as non-traditional foods such as spaghetti, bread and biscuits.



Goats eagerly eating ground acacia seed.

The seed also has great potential as livestock feed. Alternatively, the hard-coated seeds can easily be stored for many years and act as a famine reserve food.

Recent developments at the International Centre for Research in the Semi Arid Tropics (ICRISAT) have demonstrated the versatility of acacias and their high potential in agro-forestry farming systems. *Acacia coleii* and *Acacia tumida* produce three times more biomass than the fastest growing local trees. The high biomass production is the key to increasing millet yields – through annual mulching, organic matter incorporation into the soil, nitrogen fixation and wind-break effect.



Heavy crop of *Acacia elacantha* seed in low rainfall area.

Acacias also regenerate quickly after coppicing. The pruned trees provide firewood on a regular basis, thus reducing the destruction of indigenous species. Coppice re-growth stimulates seed production, providing an average 2kg of seeds per tree per year. Seeds contain up to 25% crude protein and 40% carbohydrates.



Acacia torulosa, erect type.



Acacia coleii regenerating after heavy pruning.

Based in south central Niger, the Integrated Rural Development Project (SIM) is promoting the cultivation of *Acacia torulosa* in an existing agro-forestry system called Farmer Managed Natural Regeneration. *Acacia torulosa* is long-lived, drought-tolerant and produces nutritious seeds which are easily processed. Two types of *Acacia torulosa* have been identified: a high seed-yielding, multi-stemmed type and an erect type with lower seed production and few branches.

World Vision is currently collaborating with ICRISAT and SIM to promote the cultivation of Australian acacias in agro-forestry projects in Niger, West Africa.



Eighteen months growth on *Acacia ampliceps* on alkaline soils.

Food	Classification	kcal	Protein %	Fat %	% CHO	Fibre %	Vit A ug	Vit B1 (thia) mg	Vit B2 (rib) mg	Vit B3 (nia) mg	Vit C mg	Ca mg	Fe mg	K mg	Ph mg	Na mg	Notes	Source (1-Ruth, 2-Mali Tables, 3-Galmi, 4-nut in dev count, 5-marg cam)	Vit A IU
Bread, white	Grains	240	7.7	2	51	3.1	0	0.16	0.06	1	0	37	1.7	122		700		3	0
Maize, flour	Grains	368	9.4	3.3	74.1			0.26	0.08	1		18	3.3					3	
Pasta, raw	Grains	369	12.5	1.2	75.2			0.09	0.06	1.7		27	1.3					3	
Rice, polished	Grains	362	6.8	0.5	81.1	0.4	0	0.12	0.03	2.7	0	11	1.8	141		5		3	0
Sorghum, flour	Grains	335	9.5	2.8	73	3.7	3	0.28	0.09	3.4	0	28	10					3	
Wheat	Grains	283	11.6	2.2	72.1	2.1	0	0.37	0.12	4.6	0	48	3.3		163			1	0
Beef, roasted	Meat	284	21.8	9.9	0	0	37	0.11	0.16	4	0	12	4					1	
Milk, human's	Milk	68	1.04	4.1	7.2	0	58				3.7	34	0.07					5	
<i>Acacia coleii</i> flour (processed)	Legumes	341	18	9	39.9	32	0	0.3	0.21	2.9	0	206	18	443	153	59	Vit A,D,E,K insufficient	1	0

Composition of *Acacia coleii* compared to other common grains and foods. Source: Leanne James, Nutrition Honours Thesis.