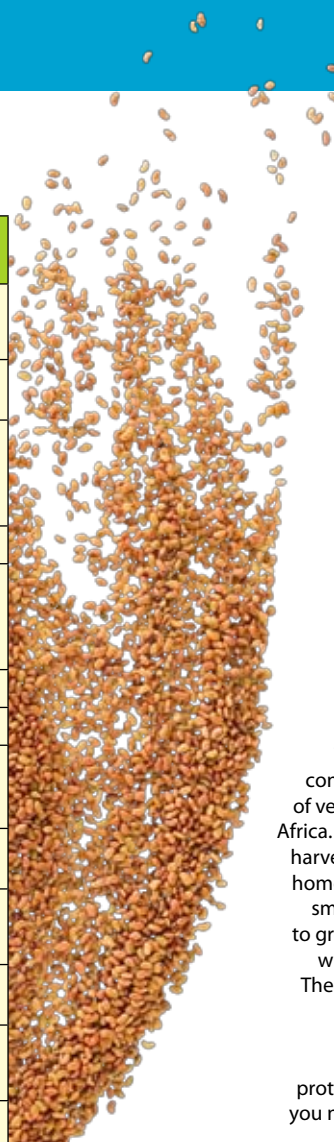


HEALTHY DIET GARDENING KIT

FOR BETTER NUTRITION AND INCREASED INCOME

Vegetable crops in the Healthy Diet Gardening Kit

Common name	Local name	Lines in the kit	Other varieties/ promising lines
Tomato	Nyanya	Meru (LBR 19-2), Kiboko (LBR 44-2), LBR6, LBR 11	Tanya, Tengeru 97, LBR 7, 10, 16 & 17, CLN 2071C
Amaranthus	Mchicha	AC-NL, Ex-Zim; AH-TL	AC 38, AC 45, AG 25, UG 40, AM 01, Ex-Mwanga
African eggplant	Ngogwe	DB3	Tengeru white, Manyire green, UG AE 13 & 20, TZSMN AE 2-8, 3-10 & 75-7, Lushoto
Sunhemp	Marejea	CML	
Ethiopian mustard	Loshuu	MLEM 1	ST 3, Mbeya purple, Mbeya green, Field station, Inhanja, Research station, TZSMN EM 36-5 & 52-9, ML EM 7
Jute mallow	Mlenda	HS	Sud 2, UG, IP5, ML-JM 10
Moringa	Mlonge	RCA1	
Nightshade	Mnavu	SS 49, BG16	EX-HAI, TZSMN 55-3, SS04.02, SS52, BG14, 18, 22, & 23 & 18
Okra	Bamia	RCA1	TZ SMN86, ML-OK 10, 16, 35 & 37
Pumpkin	Maboga	GKK 174	GKK163, 174, & 206, Ug PKN1 & 2, ML PKN 40 & 45, TZ SMN 14-4
Spider plant	Mgagani	PS	RW SF4, ML SF22, IP8, UG SF1, GPS, GS
Vegetable cowpea	Kunde	Vuli	Fahari, Ex-Iseke, Tumaini, TZ2727 & 2344, RW CP7, UG CP 8
Vegetable soybean	Maharage soya mboga	AGS 292	AGS 329 338, 339



Inside this Kit

The Healthy Diet Gardening Kit contains seed of 18 different kinds of vegetables, mostly indigenous to Africa. These seeds will produce good harvests of nutritious vegetables for home gardens, school grounds, and small farms. There is enough seed to grow a 6 m x 6 m plot for a family with 6-8 members all year round. The surplus can be sold to increase household income.

Indigenous vegetables provide protein, vitamins, iron and minerals you need every day for good health.



Cultivation guide

Mchicha

Amaranth (*Amaranthus* spp.)



Amaranth is grown throughout the year by either directly sowing in beds at a depth of 0.5-1.0 cm in rows 20-30 cm apart, or by broadcasting. Thinning is done after 3 weeks when plants have 3-4 true leaves, spaced at 20-30 cm between rows and 10-15 cm from plant-to-plant within rows. For seed production, the recommended spacing is 60 cm between rows and 25 cm between plants. Harvesting is usually done within 3-5 weeks of sowing, depending on the variety.

Ngogwe

African eggplant (*Solanum* spp.)



African eggplant prefers sunny conditions and grows on a range of soils including sandy loams but does not cope with waterlogging or intense shading. It can be grown throughout the year when water is available. Sow seed in rows 15-20 cm apart with 1 cm spacing between seeds within a row in nursery beds provided with cow dung, chicken or compost manures at 3-5 kg/m². Thin seedlings to 1-2 cm apart, harden 3 weeks after sowing, and transplant after 4-6 weeks when they

have 4-7 true leaves. Space plants 60 cm between rows and 50 cm between plants. Compost, cattle or chicken manure can be applied at 0.2-0.5 kg/hole or urea fertilizer at 5 g/plant. For seed production: Space plants at 60 cm between rows and 50 cm between plants. Fruit is harvested when fully ripe and yellow, orange, or red in color, depending on the species. Harvesting is done every week starting 2 months after transplanting and can last 6-7 months. Old plants can be pruned at the base to produce young shoots that bear fruit in 2-3 months. To save seed, separate seed from pulp, ferment for 24-72 hours, dry, pack, and store in a cool dry place.

Majerea

Sunhemp (*Crotalaria ochroleuca* and *C. brevidens*)



This popular African indigenous vegetable grows in a range of soils during the long warm to hot season as a monocrop or intercropped with other crops such as maize. When intercropped, other plants benefit from its nitrogen fixation and control of nematodes. The oil from seeds is used to control insect pests. Seeds are directly sown in the field on raised ridges or flat beds 30-50 cm between rows and 5 cm x 5 cm from plant-to-plant within rows. Thinning is done 6-8 weeks after planting leaving

only one plant spaced 20 cm from plant-to-plant within rows. The thinned seedlings can be consumed as vegetables.

Mlenda

Jute mallow (*Corchorus olitorius*)

An indigenous vegetable that grows in a range of soil types (except clay soils) and thrives in areas with prolonged moisture and hot weather. Seeds can be directly sown in the field or sown in nursery and transplanted. In the field, seeds can be sown on raised ridges or flat beds at 30-50 cm between rows and 25 cm x 25 cm from plant-to-plant within rows. Thin when seedlings are 7-10 cm high, leaving one plant/hole spaced 25 cm apart. Dig cattle or chicken manure or compost into the soil for best results. The first harvest consists of thinned plants with their roots, the next harvest will be tops picked at about 15 cm above ground, repeated 3-4 times.



Loshuu

Ethiopian mustard (*Brassica carinata*)

Seeds are sown in nursery beds at 0.5-1 cm depth spaced 15-20 cm between rows and 1 cm from seed-to-seed within rows. The seedlings are then thinned to 1-2 cm spacing and transplanted when they reach 4-5 leaf stage. Transplanted plants are spaced 30 cm x 30 cm between plants in a row and 50 cm x 50 cm between rows. Both nursery and field plants benefit from the addition of animal manure or compost.



Mvanu

African nightshade (*Solanum* spp.)

Several species are grown for their nutritious leaves, including *Solanum americanum*, *S. scabrum* and *S. villosum*. Only the yellow to orange-colored fruits of *S. villosum* are edible while those from other species are poisonous. Mix seeds with sand at 1:3 to make them easier to sow at about 1 cm apart in rows 15-20 cm apart. Thin seedlings to 2-4 cm between plants. After 4-6 weeks, seedlings with 4-6 true leaves are transplanted using 20 x 20 cm spacing for continuous picking in home gardens or, spaced 50 x 50 cm for seed production. The first harvest is about 5 weeks after transplanting and continues for 9 months. To maximize leaf yield, the lateral and main stem should be cut about 5-10 cm from the tip to allow side shoots to develop, which will allow 3-4 pickings per plant at 7-14 days intervals. Seed production takes about 4-6 months after thinning and transplanting. Ripe fruits are fermented for 24 hours in water, and the seed is washed, dried, packed and stored in a cool dry place. Nightshade can be grown throughout the year if water is available.



Mgagani

Spider plant (*Cleome gynandra*)



A traditional vegetable that prefers warm sunny conditions and a range of soils including sandy loams. It does not cope well with waterlogging, very cold weather or shade. Grow as a monocrop or intercropped with nightshade or amaranth. Spider plant benefits from the addition of manure or compost at 2 kg/m². Seeds can be sown by broadcasting or in rows 30-50 cm apart; thin plants at 15-20 cm between plants in rows or about 5 cm between plants if broadcast. To harvest, uproot whole

young plants 5-6 weeks after sowing. Re-sowing can be done straight away. Young leaves and stems also can be regularly harvested as the plant grows so that new leaves are produced for up to 4 months. Plants older than 4 months can be cut at the base (ratooning), which allows young shoots to sprout; shoots can be harvested for 4 months.

Mlonge

Moringa (*Moringa oleifera*)



This fast-growing, drought-tolerant perennial tree grows in well-drained fertile soils, particularly loamy soils. Two to three seeds are sown in containers filled with fertilizer-supplemented soil. Thinning is done after 2-3 weeks, leaving one healthy seedling in each container. Seedlings about 50 cm high are ready for transplanting. To grow from cuttings: Stems 45-150 cm in length and 4-16 cm in diameter are selected from fully mature branches, cut and left under shade for 3 days prior

to planting. Plants are spaced 2-3 m apart and 2 m between rows. Shoots can be harvested 55-70 days after planting and biweekly thereafter.

Bamia

Okra (*Abelmoschus esculentus*)



An erect, warm-weather annual vegetable that grows in a range of well drained fertile soils. It does not grow well during cold weather. Okra is grown as a monocrop or intercropped with amaranth, cowpea, or maize. Seeds are directly sown in gardens or fields. Soak seeds for 12 hours before sowing to improve germination. Two to four seeds are sown on raised ridges or flat beds with 45-70 cm spacing between rows and 30 cm x 30 cm spacing from plant-to-plant within rows. Thin seedlings when 8-10 cm high, leaving one plant per

hill. Apply 2-4 handfuls of cattle or chicken manure or, 5 g/plant urea.



Nyanya

Tomato (*Solanum lycopersicum*)

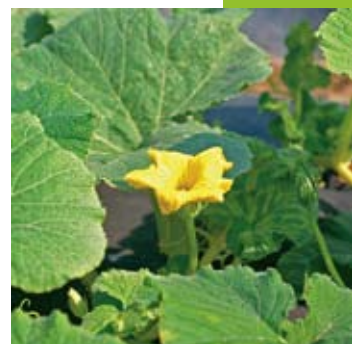
Year-round production is possible in areas located at 400 to 1500 meters above sea level and in many kinds of soil from sandy to heavy clay. Seeds should be sown in rows 15-20 cm apart and 1 cm within rows at a depth of 0.2-1.0 cm. Thin to 1-2 cm spacing. Transplanting is done 4-6 weeks after sowing when seedlings have 4-7 true leaves. Plants benefit from cow or chicken manure and compost or NPK fertilizer at 5 g/plant. Space 40 cm x 40 cm from plant-to-plant within rows and 60 cm x 60 cm between rows. Apply 5 g urea 2-4 weeks after planting and stake the plants for best growth. First harvesting takes around 60 days from transplanting and continues up to 6-8 weeks.



Maboga

Pumpkin (*Cucurbita moschata*)

Pumpkin is an easy-to-grow warm season vegetable. It is grown as a monocrop or intercropped with maize and other field crops. Seeds are directly sown in 15 cm deep furrows, or sown in containers for transplanting. Space plants 60-120 cm apart in rows 90-120 cm apart. Fruit can be harvested about 2 months after planting.



Kunde

Vegetable cowpea (*Vigna unguiculata*)

Cowpea is a warm-season drought tolerant annual crop that originated in Africa. It does not grow well in cold season. Determinate bushy types or indeterminate viny types are grown either intercropped or in relay with maize, cassava, groundnuts, sorghum, or pearl millet. Seeds are sown on ridges or flat beds at a depth of 5 cm. For spreading types, use rows 50-60 cm apart with 15 cm between plants within a row. For erect types, use 15-30 cm between plants within a row. When the crop is grown mainly for its leaves, sow on 1 m wide beds with 6 rows spaced at 15 cm apart and 10 cm between plants within a row to produce more good quality leaves. Leaves are harvested 6-7 weeks after sowing and continue up to 12 weeks. For seed production, spacing of 30 cm between rows and 15 cm between plants is recommended. Seeds are dried for 4-6 days and stored in a cool dry place.



Maharage soya mboga

Vegetable soybean (*Glycine max*)

Characteristics: This warm-season crop grows better in well-drained fertile soils. Seeds are sown at a depth of 5 cm on raised ridges on both sides spaced 60 cm between ridges, or on flat beds. Alternatively, seeds can be sown on 1 m wide ridges with 6 rows spaced 15 cm between rows and 10 cm between plants within rows. Plants are spaced 40-50 cm between rows and 10 cm within rows.



FAO/WHO recommended nutrient intake (RNI)

	Protein (g)	Vitamin A (mcg RE)	Vitamin C (mg)	Vitamin E	Folic acid (mg)	Calcium (mg)	Iron (10% mg)	Zinc (mg)
Adult man (70 kg)	61.6	600	45	7.5	400	1000	13.7	7
Adult woman (60 kg)	52.8	600	45	10	400	1000	29.4	4.9
Adolescents	113.5	1200	80	17.5	800	2600	51.2	15.8
Child (7 - 9 yrs)	31.5	500	35	7	300	700	8.9	5.6
Child (1 - 3 yrs)	25.4	400	30	5	150	500	5.8	4.1
Total	341.7	4200	300	59	2500	7000	123.7	47.1

Nutritional facts for some vegetables in the Healthy Diet Gardening Kit

Crop	Part	Dry matter (g)	Protein (g)	Fiber (g)	b-carotene (mg)	Vitamin C (mg)	Vitamin E (mg)	Ca (mg)	Fe (mg)	Zn (mg)	Antioxidant activity (µmol trolox)	Total phenols (mg)	Oxalate (mg)
Tomato	fruits	4.10	0.89	0.44	0.05	19	0.7	8	0.54	0.15	323	64	26
Amaranth	young leaves	14.4	5.21	1.78	5.65	81	2.21	264	2.66	2.93	899	272	284
African eggplant	mature fruits	9.10	0.97	1.53	0.16	8	0.50	12	0.59	0.18	383	83	11
Ethiopian mustard	young leaves	11.3	3.37	1.48	0.29	183	1.80	153	1.39	0.72	849	260	13
Jute mallow	young shoots	14.3	5.13	1.59	2.86	92	2.80	213	2.89	0.77	508	115	87
Moringa	young shoots	11.4	3.95	1.09	2.19	240	nd	34	2.55	0.00	1663	314	12
Nightshade	young shoots	11.0	4.69	1.08	4.84	132	2.10	206	3.89	0.93	683	156	60
Okra	young pods	8.10	1.71	0.76	0.00	26	0.40	112	0.60	0.41	835	120	167
Pumpkin	mature gourd	8.30	2.21	0.84	0.56	9.00	nd	9	0.73	0.28	913	79	17
Spider plant	young leaves	10.30	4.36	1.06	2.33	103	0.60	170	2.21	0.88	1439	273	80
Vegetable cowpea	leaves	14.60	4.83	2.02	0.35	104	0.50	218	2.56	0.72	1796	575	295
Vegetable soybean	immature pods	26.70	10.83	1.12	0.08	38	nd	36	4.04	1.48	565	208	4



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