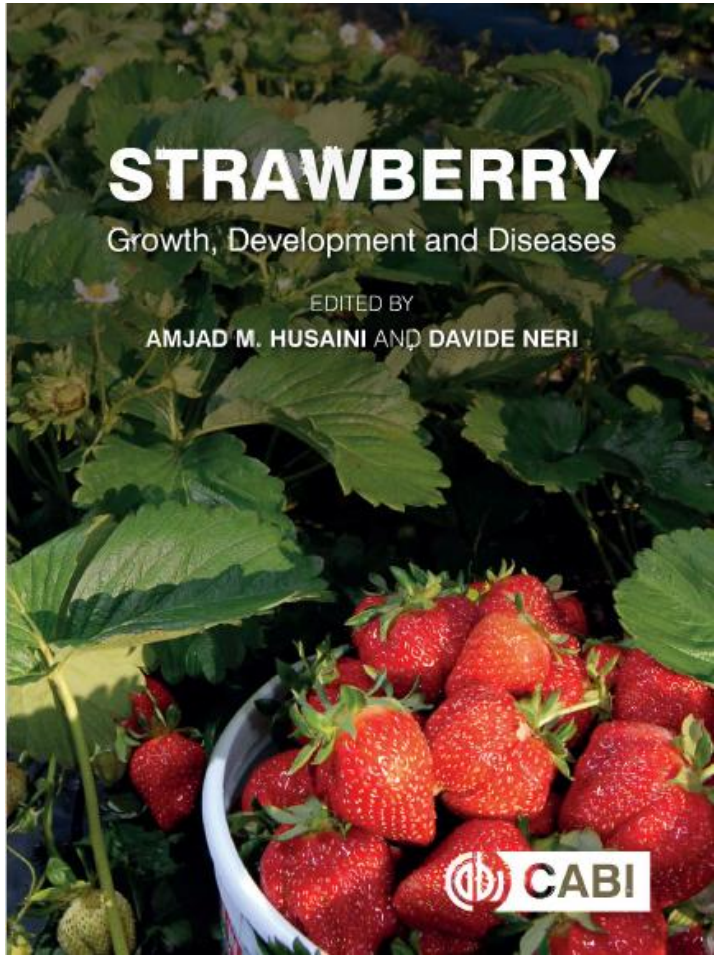

Strawberry



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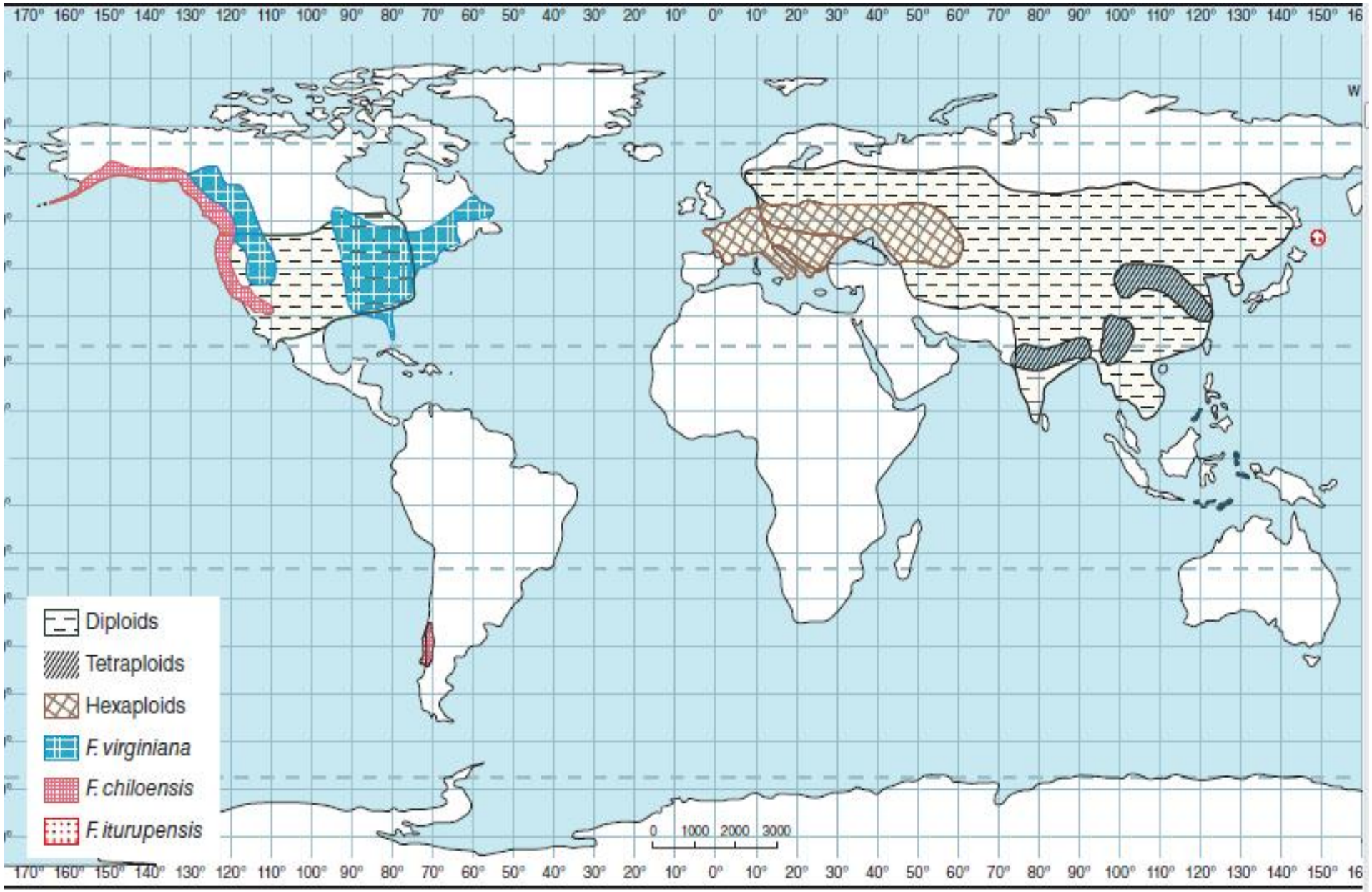
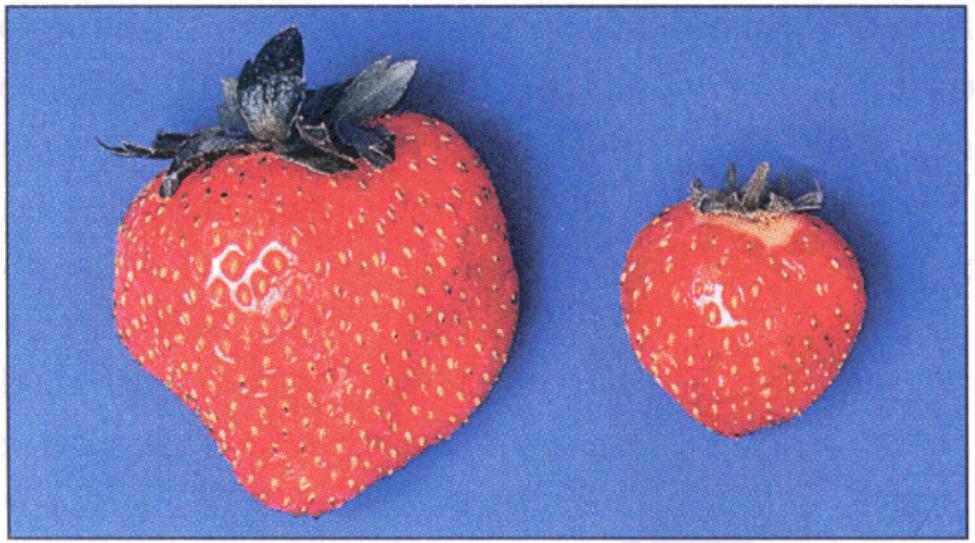


g. 2.1. World distribution of *Fragaria* spp.

Fragaria moschata

Fragaria virginiana



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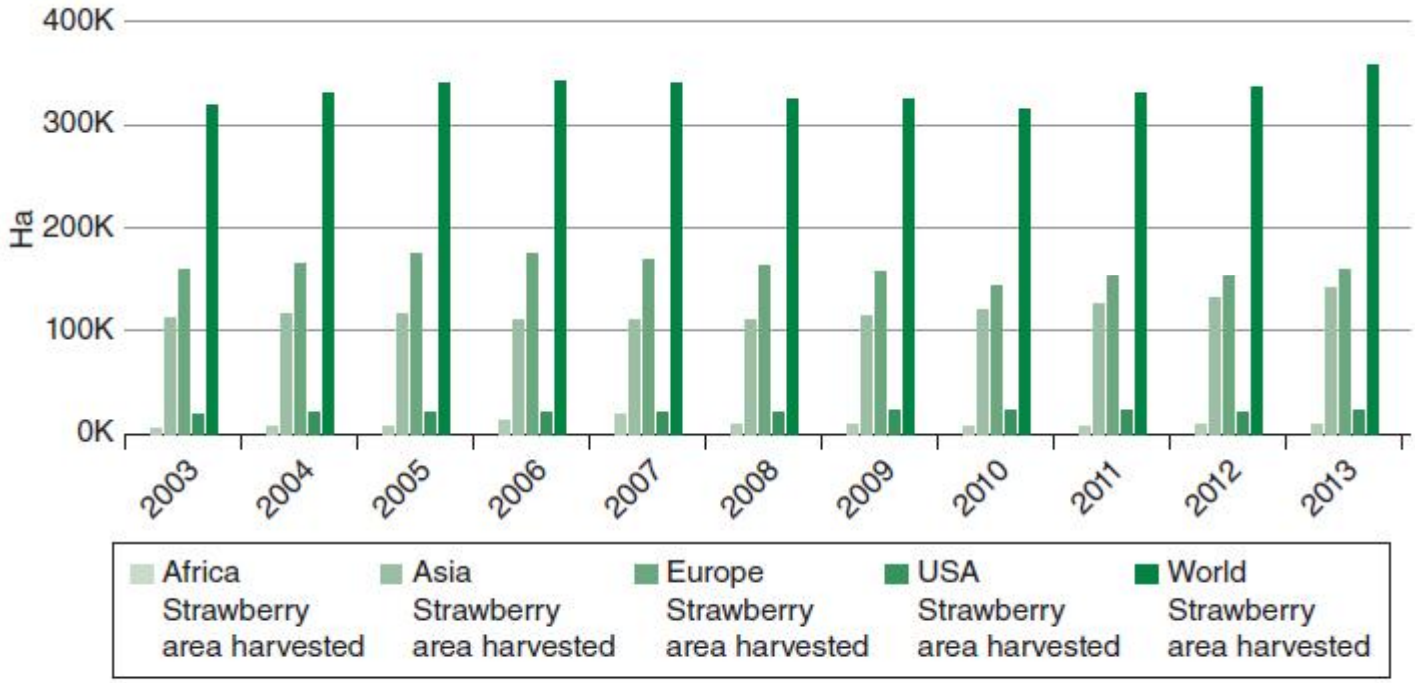


Fig. 1.1. Trend in strawberry area harvested across major regions. K, thousand.

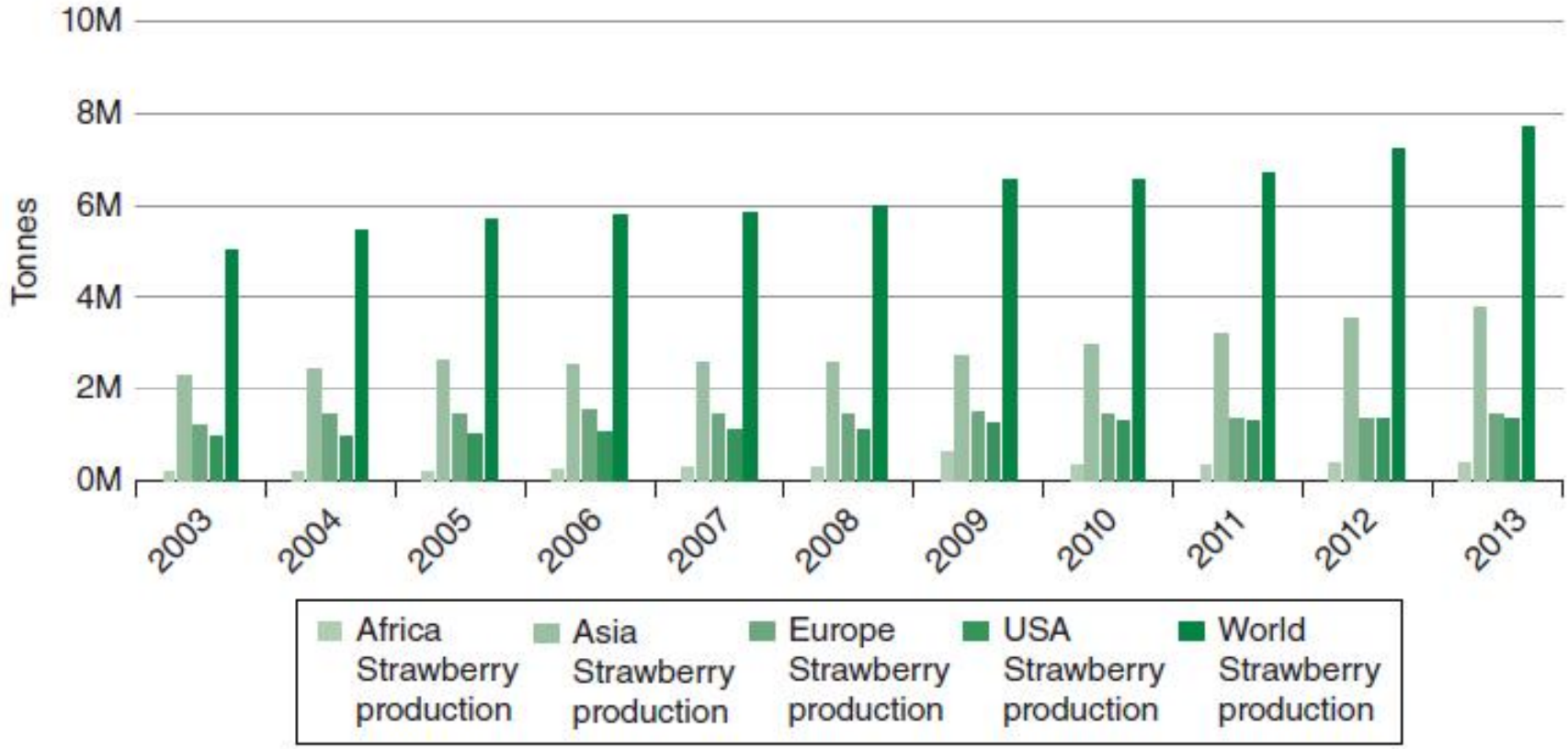
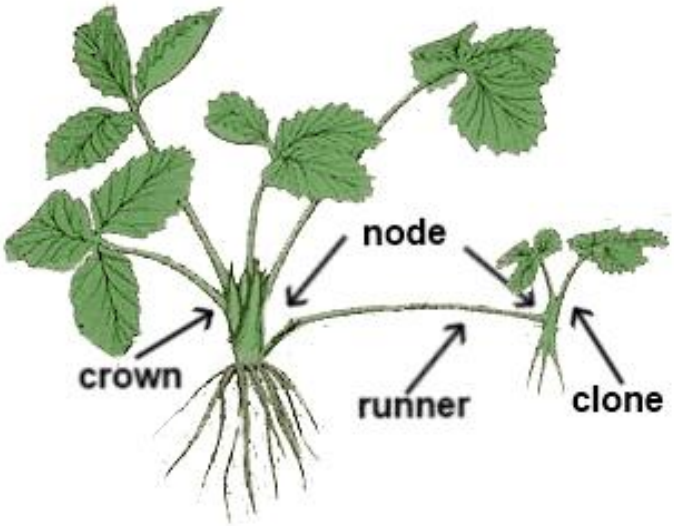
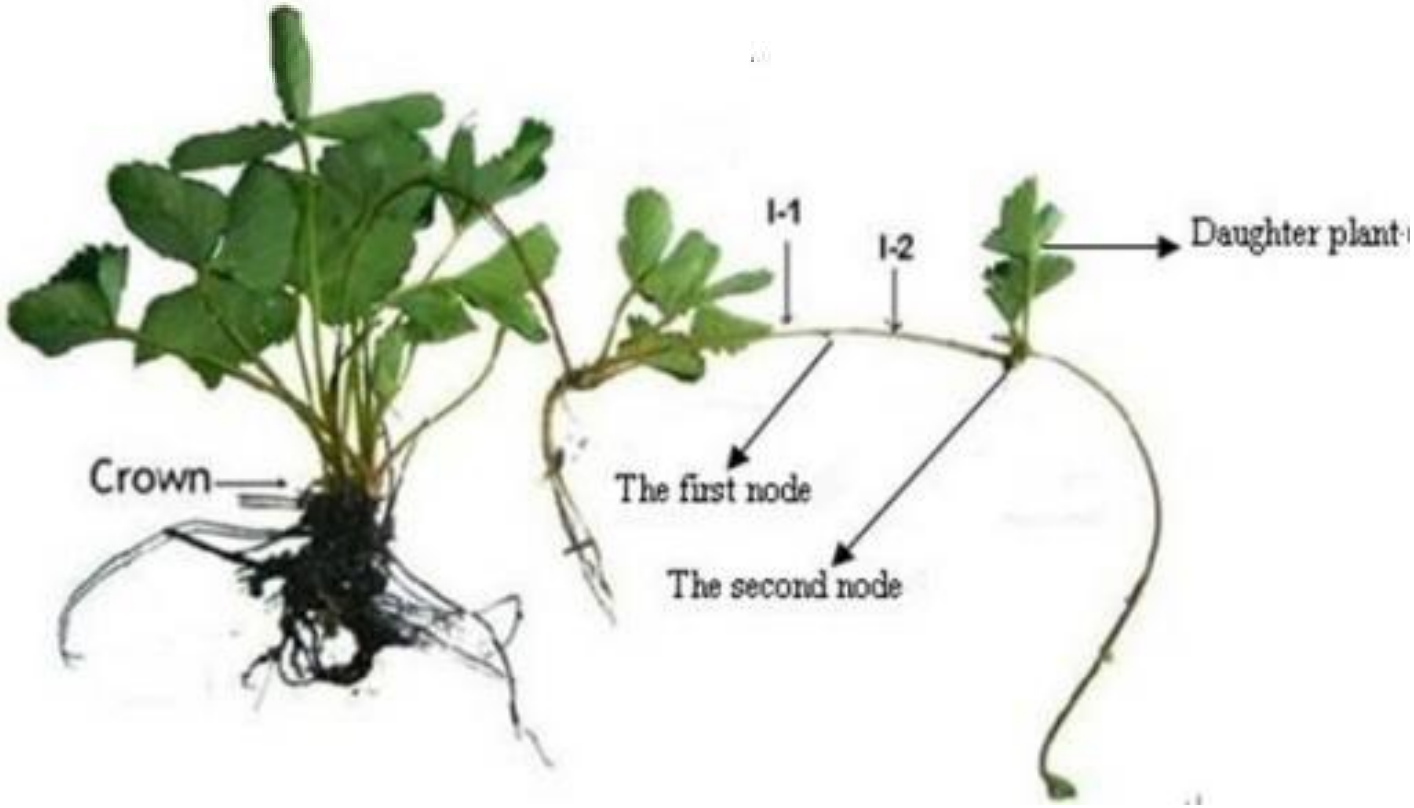


Fig. 1.3. Trend in strawberry production across major regions. M, million.

China, mainland	2997504
United States of America	1382096
Mexico	379464
Turkey	372498
Spain	312466
Egypt	262432
Republic of Korea	216803
Poland	192647
Russian Federation	188000
Japan	165600
23. Iran (Islamic Republic of)	39296


node
crown
runner
clone


I-1
I-2
Daughter plant
Crown
The first node
The second node

Modified Stems

- A **stolon** is a horizontal stem that is fleshy or semi-woody and lies along the top of the ground.
- A runner is a type of stolon. Strawberry
- It is a specialized stem that grows on the soil surface and forms a new plant at one or more of its nodes.
- The leaves on strawberry runners are small but are located at the nodes which are easy to see.

Table 1.2. Nutritional composition of strawberry (*Fragaria* × *ananassa* Duch.). (From US Department of Agriculture: http://ndb.nal.usda.gov/ndb/search/list?qlookup=09316&format=Full.)

Component	Per 100 g	Standard error	Component	Per 100 g	Standard error
Nutrient			Lipids		
Water (g)	90.95	0.214	Fatty acids, total saturated (g)	0.015	–
Energy (kcal)	32	–	16:00 (g)	0.012	–
Energy (kJ)	136	–	18:00 (g)	0.003	–
Protein (g)	0.67	0.026	Fatty acids, total monounsaturated (g)	0.043	–
Total lipid (fat) (g)	0.3	0.047	16:1 undifferentiated (g)	0.001	–
Ash (g)	0.4	0.021	18:1 undifferentiated (g)	0.042	–
Carbohydrate, by difference (g)	7.68	–	Fatty acids, total polyunsaturated (g)	0.155	–
Fibre, total dietary (g)	2	0.152	18:2 undifferentiated (g)	0.09	–
Sugars, total (g)	4.89	–	18:3 undifferentiated (g)	0.065	–
Sucrose (g)	0.47	0.328	18:4 (g)	0	–
Glucose (dextrose) (g)	1.99	0.194	20:4 undifferentiated (g)	0	–
Fructose (g)	2.44	0.198	20:5 *n*-3 (EPA) (g)	0	–
Lactose (g)	0	0	22:5 *n*-3 (DPA) (g)	0	–
Maltose (g)	0	0	22:6 *n*-3 (DHA) (g)	0	–
Galactose (g)	0	0	Cholesterol (mg)	0	–
Starch (g)	0.04	0.029	Phytosterols (mg)	12	–
Vitamins			Amino acids		
Vitamin C, total ascorbic acid (mg)	58.8	2.473	Tryptophan (g)	0.008	–
Thiamin (mg)	0.024	0.003	Threonine (g)	0.02	–
Riboflavin (mg)	0.022	0.008	Isoleucine (g)	0.016	–
Niacin (mg)	0.386	0.037	Leucine (g)	0.034	–
Pantothenic acid (mg)	0.125	0.003	Lysine (g)	0.026	–
Vitamin B-6 (mg)	0.047	0.012	Methionine (g)	0.002	–
Folate, total (µg)	24	5.465	Cystine (g)	0.006	–
Folic acid (µg)	0	–	Phenylalanine (g)	0.019	–
Folate, food (µg)	24	5.465	Tyrosine (g)	0.022	–
Folate, DFE (µg)	24	–	Valine (g)	0.019	–
Choline, total (mg)	5.7	–	Arginine (g)	0.028	–
Betaine (mg)	0.2	–	Histidine (g)	0.012	–
Vitamin B-12 (µg)	0	–	Alanine (g)	0.033	–
Vitamin B-12, added (µg)	0	–	Aspartic acid (g)	0.149	–
Vitamin A, RAE (µg)	1	0.031	Glutamic acid (g)	0.098	–

Retinol (µg)	0	–	Glycine (g)	0.026	–
Carotene, β (µg)	7	0.22	Proline (g)	0.02	–
Carotene, α (µg)	0	0	Serine (g)	0.025	–
Cryptoxanthin, β (µg)	0	0	Minerals		
Vitamin A, (IU)	12	0.625	Calcium (Ca) (mg)	16	0.562
Lycopene (µg)	0	0	Iron (Fe) (mg)	0.41	0.026
Lutein + zeaxanthin (µg)	26	8.04	Magnesium (Mg) (mg)	13	0.222
Vitamin E (α-tocopherol) (µg)	0.29	0.024	Phosphorus (P) (mg)	24	0.72
Vitamin E, added (mg)	0	–	Potassium (K) (mg)	153	4.073
Tocopherol, β (mg)	0.01	0.002	Sodium (Na) (mg)	1	0.1
Tocopherol, γ (mg)	0.08	0.01	Zinc (Zn) (mg)	0.14	0.013
Tocopherol, δ (mg)	0.01	0.005	Copper (Cu) (mg)	0.048	0.004
Vitamin D (D2 + D3) (µg)	0	–	Manganese (Mn) (mg)	0.386	0.018
Vitamin D (IU)	0	–	Selenium (Se) (µg)	0.4	–
Vitamin K (phylloquinone) (µg)	2.2	0.29	Fluoride (F) (µg)	4.4	0.4
Anthocyanidins			Flavonols		
Petunidin (mg)	0.1	0.1	Isorhamnetin (mg)	0	–
Delphinidin (mg)	0.3	0.28	Kaempferol (mg)	0.5	0.01
Malvidin (mg)	0	0.01	Myricetin (mg)	0	0.04
Pelargonidin (mg)	24.8	0.69	Quercetin (mg)	1.1	0.04
Peonidin (mg)	0	0.05	Isoflavones		
Cyanidin (mg)	1.7	0.05	Daidzein (mg)	0	0
Flavan-3-ols			Genistein (mg)	0	0
(+)-Catechin (mg)	3.1	0.19	Glycitein (mg)	0	–
(–)-Epigallocatechin (mg)	0.8	0.35	Total isoflavones (mg)	0	0.005
(–)-Epicatechin (mg)	0.4	0.13	Formononetin (mg)	0	–
(–)-Epicatechin 3-gallate (mg)	0.2	0.02	Coumestrol (mg)	0	–
(–)-Epigallocatechin 3-gallate (mg)	0.1	0.06	Proanthocyanidin		
(+)-Gallocatechin (mg)	0	0.005	Proanthocyanidin monomers (mg)	3.7	0.8
Flavanones			Proanthocyanidin dimers (mg)	5.3	1.89
Hesperetin (mg)	0	0	Proanthocyanidin trimers (mg)	4.9	2.27
Naringenin (mg)	0.2	0.25	Proanthocyanidin 4–6mers (mg)	28.1	6.47
Flavones			Proanthocyanidin 7–10mers (mg)	23.9	3.47
Apigenin (mg)	0	0	Proanthocyanidin polymers (>10mers) (mg)	75.8	13.36
Luteolin (mg)	0	0.001			

Potentilla fruticosa

Strawberry 'Pink Panda'

Table 3.1. Results obtained in the breeding programmes carried out in California, USA, and Po Valley, Italy. (From Shaw and Larson, 2008.)

Location		Yield (g per plant)	Fruit size (g)	Firmness (N)
California[a]	1945–1966	595	14.9	0.245
	1993–2004	1.429	24.9	0.456
Italy[b]	1970–1980	768	16.5	0.389
	2000–2010	1.390	26.1	0.572

[a]Average data from the two cultural techniques of winter planting and summer planting of the reference varieties.
[b]Average data from the five best advanced selections (summer planting).

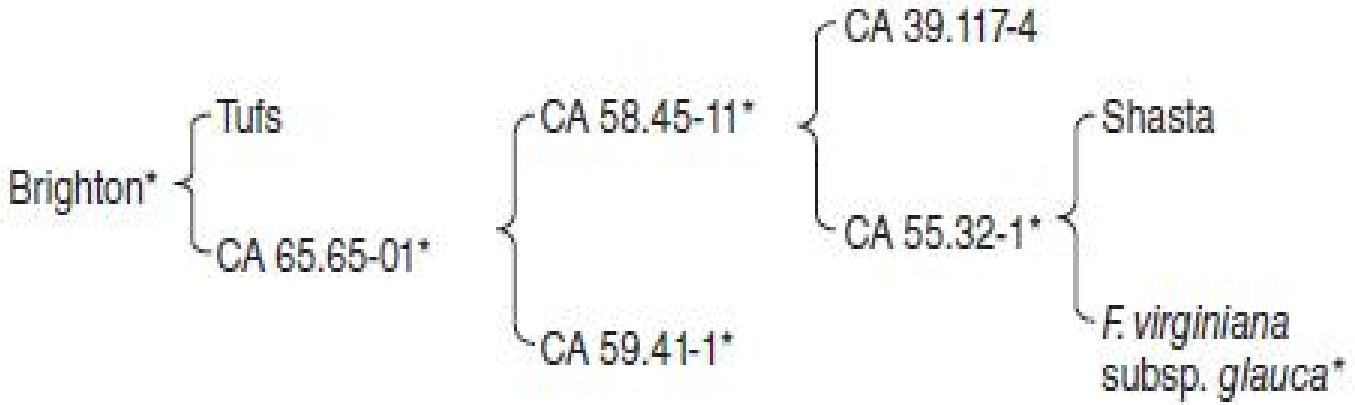
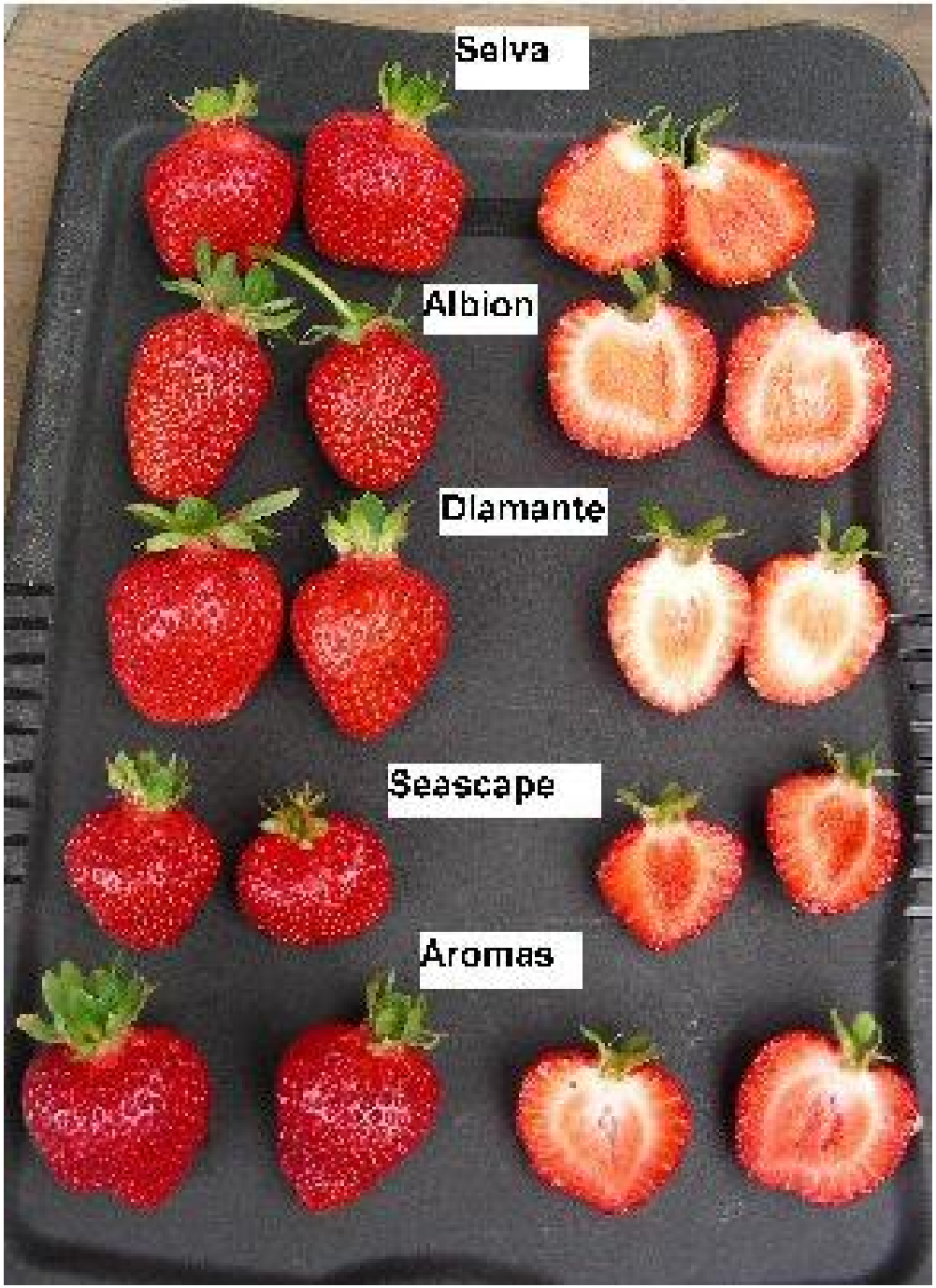


Fig. 3.1. Pedigree of the Californian ever-bearing day-neutral cultivar 'Brighton'. *, Day-neutral genotype.


Selva
Albion
Diamante
Seascape
Aromas


CAMAROSA

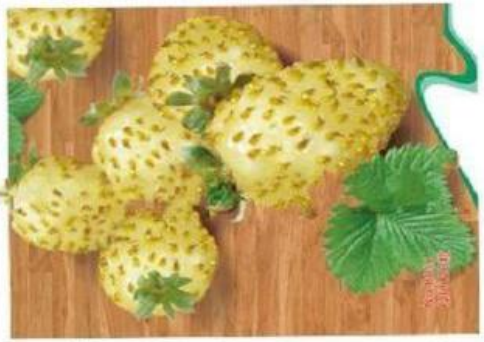
Fig. 4.1. (a) White strawberry culture in Contulmo, Región del Bio-Bio, Chile. (b) Infected plant. (c) Commercialization of white and red strawberry at the Putu market, Región del Maule, Chile. (a, b) From Rudi Montenegro (Universidad Austral de Chile, Chile); (c) from Cristina Theoduloz (Universidad de Talca, Chile).

NO.1 Green Strawberry 50 seeds

NO.2 Black Strawberry 50 seeds

NO.3 Red Climbing Strawberry 50 seeds

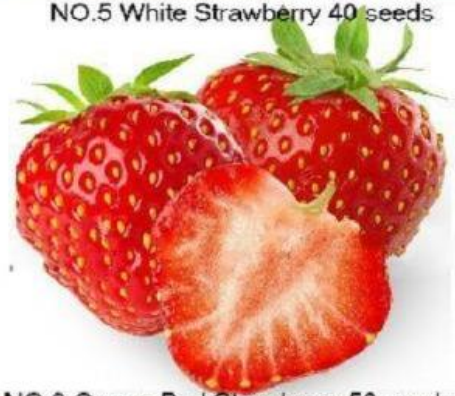
NO.4 Pineberry 80 seeds



NO.5 White Strawberry 40 seeds

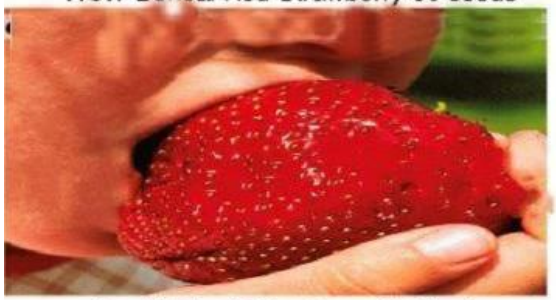
NO.6 Normal Red Strawberry 50 seeds

NO.7 Bonsai Red Strawberry 50 seeds



NO.8 Cream Red Strawberry 50 seeds

NO.9 Perennial Red Strawberry 40 seeds



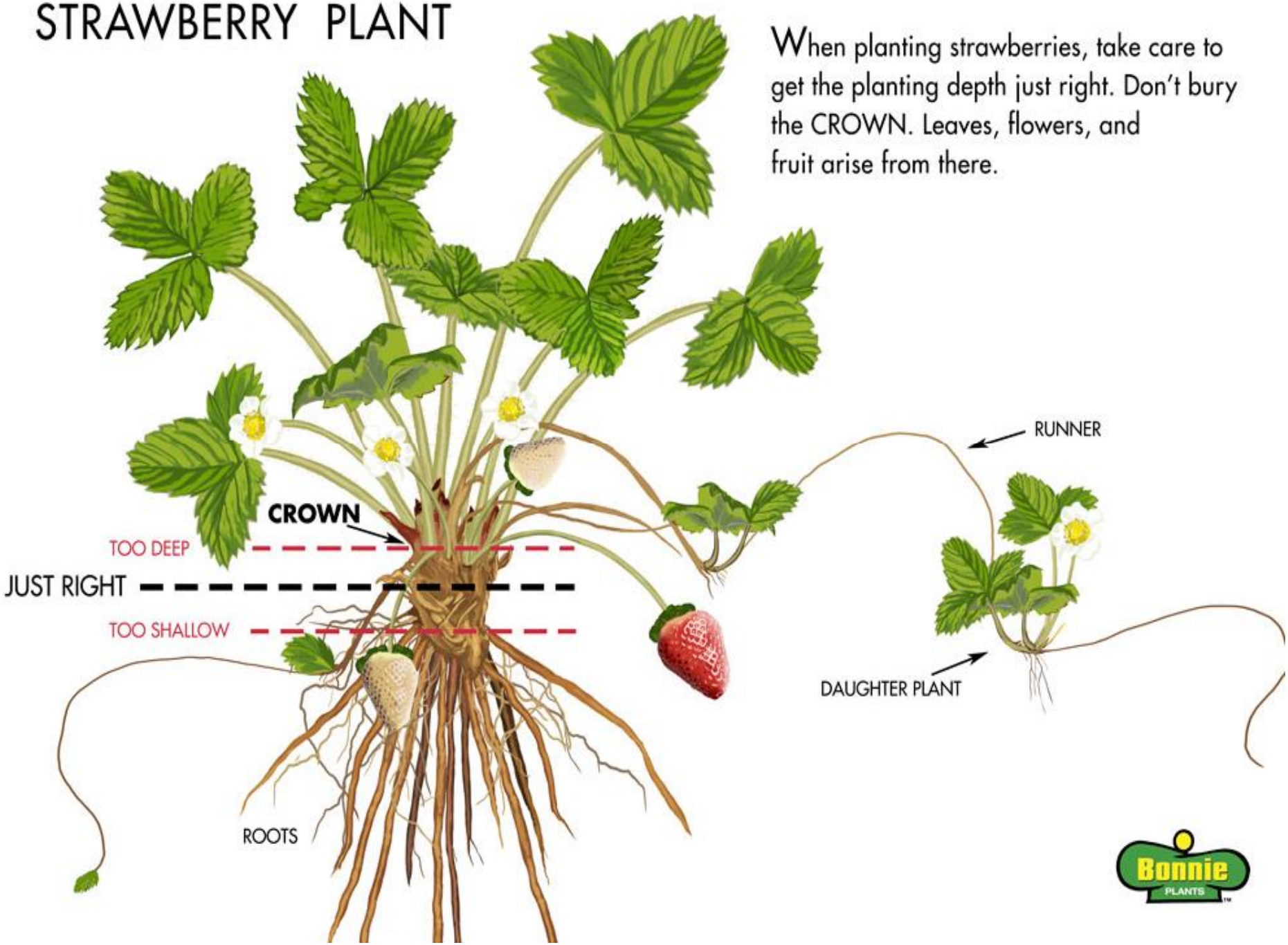
No.10 Giant Strawberry 50 Seeds

NO.11 Mini Red Strawberry 50 seeds

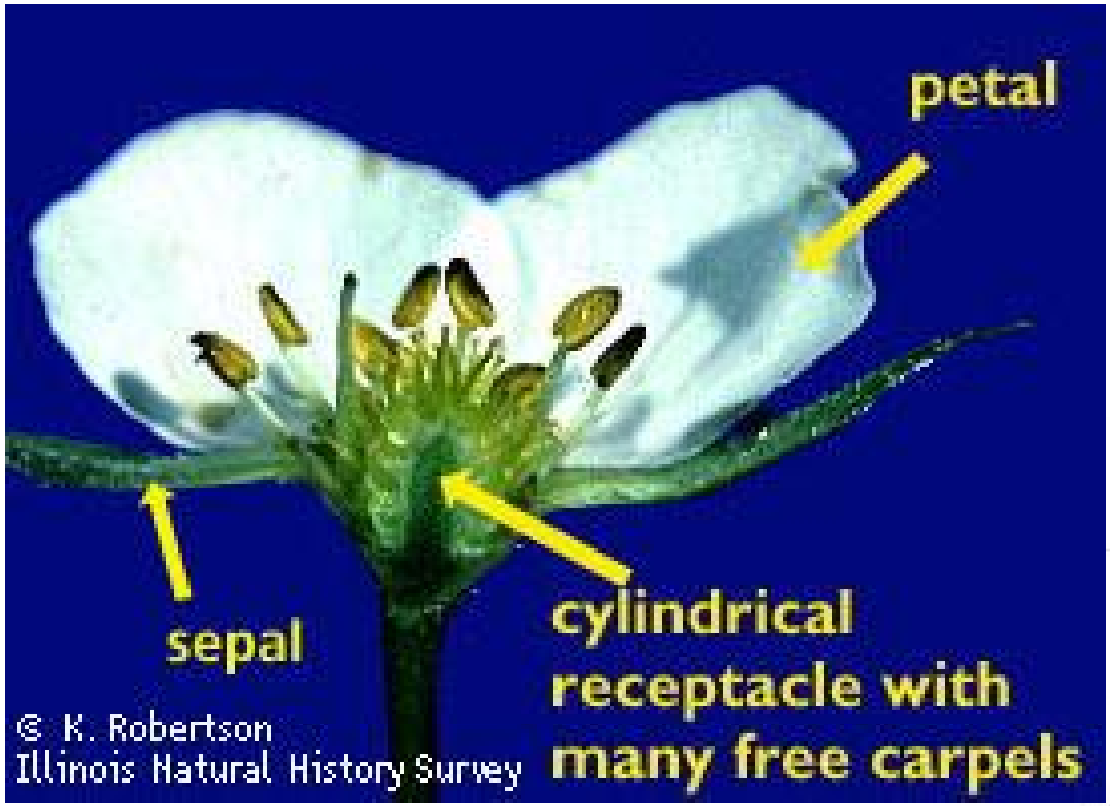
NO.12 African Blue Strawberry 50 seeds

STRAWBERRY PLANT

When planting strawberries, take care to get the planting depth just right. Don't bury the CROWN. Leaves, flowers, and fruit arise from there.



Bonnie PLANTS



Strawberry flower

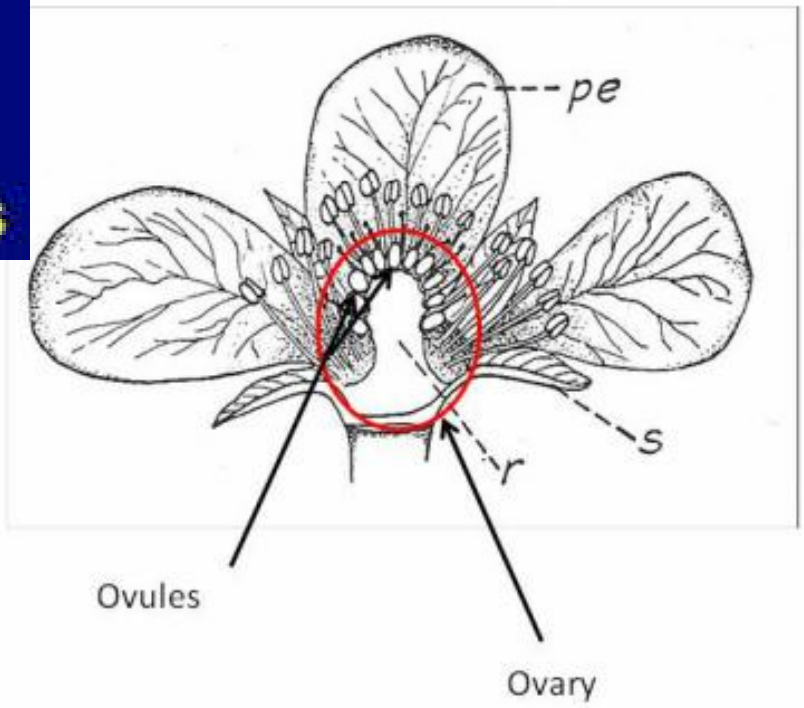


Illustration from the classic botany text by Hill, et al.

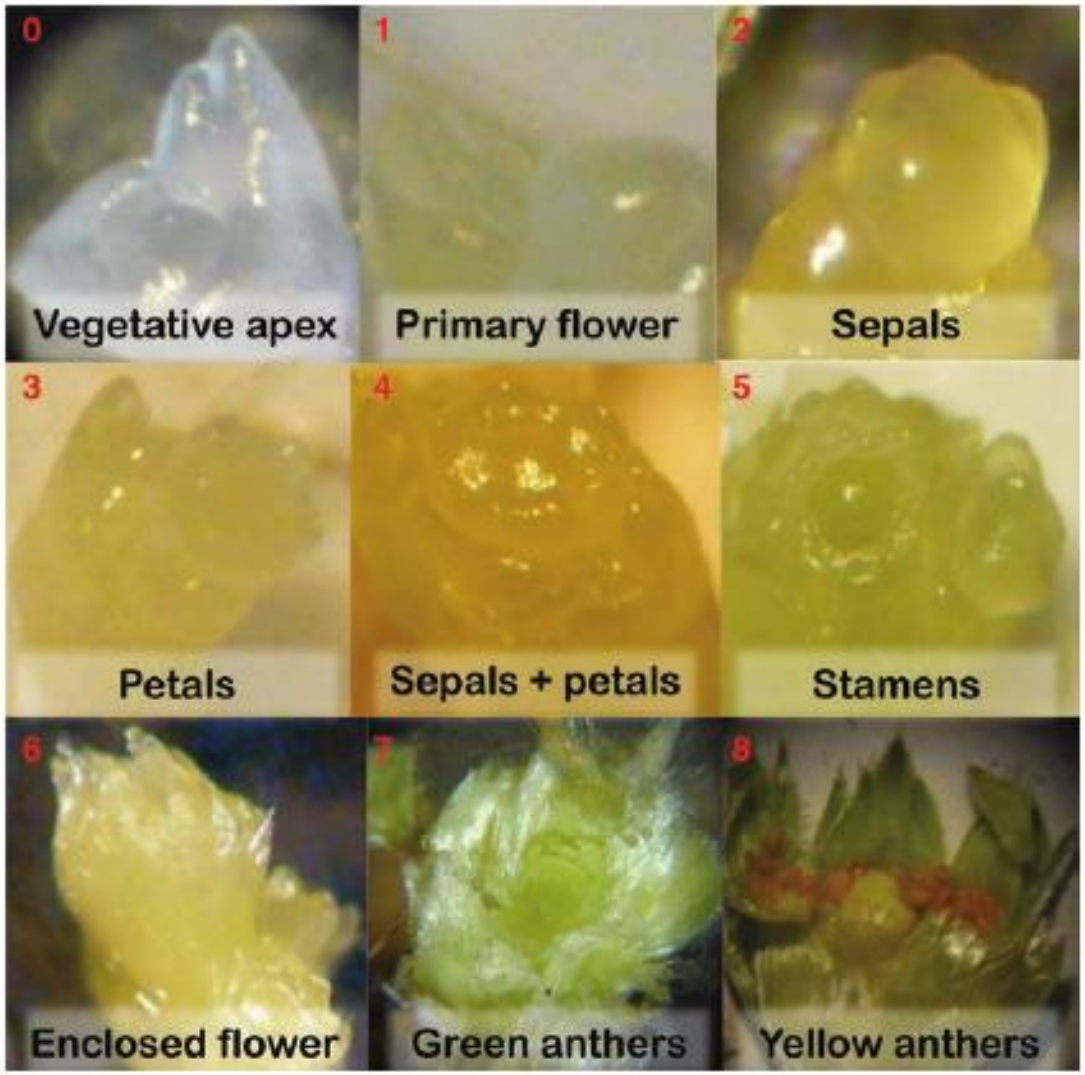


Fig. 7.1. Scale of differentiation of the phases of strawberry inflorescence. (Modified from Neri *et al.*, 2010.)

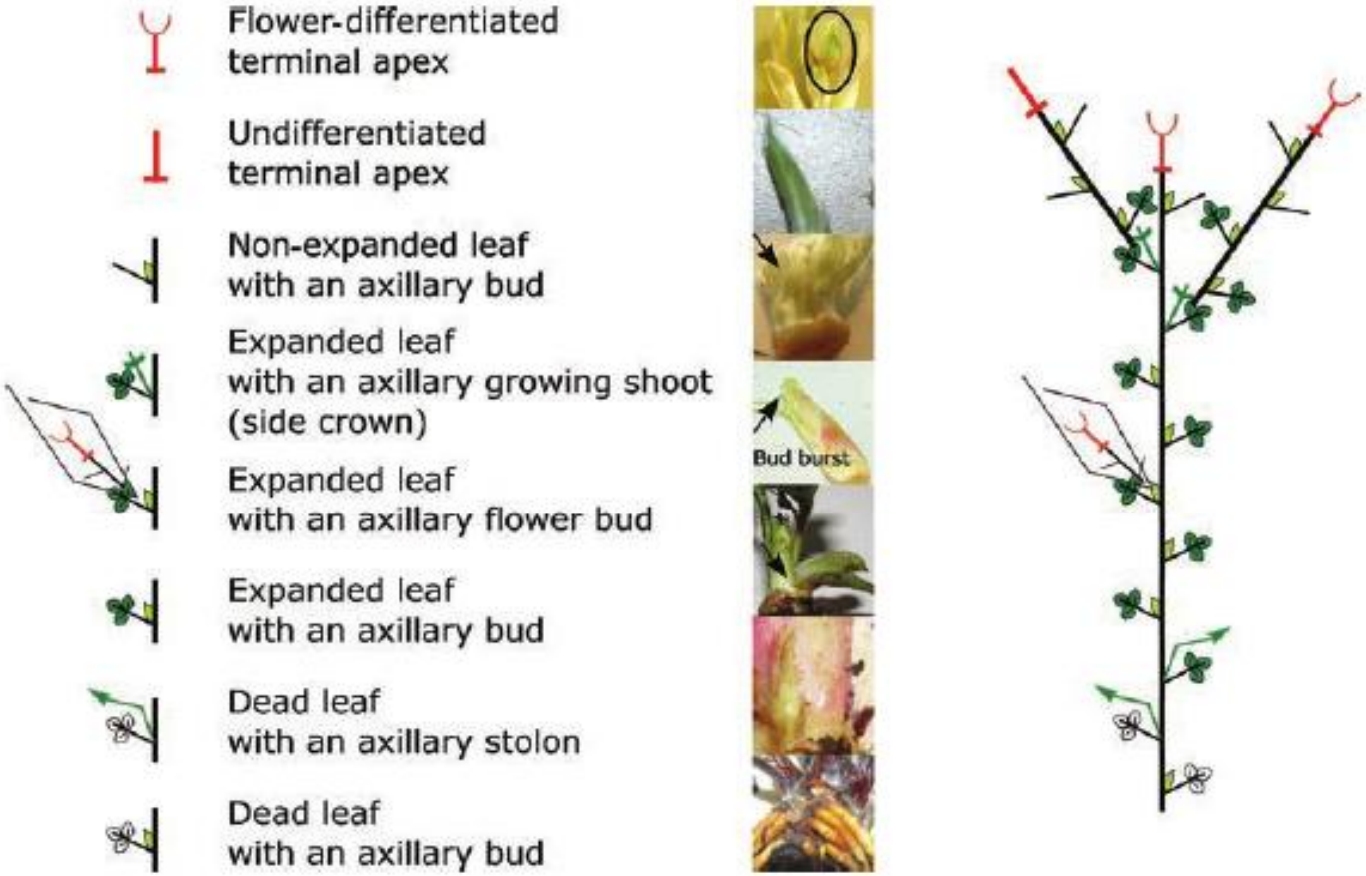


Fig. 7.2. Schematic representation of strawberry plant architecture using conventional symbols. Left: conventional symbols with their definition, illustrated in the photos; right: example of a schematic representation of a single plant.