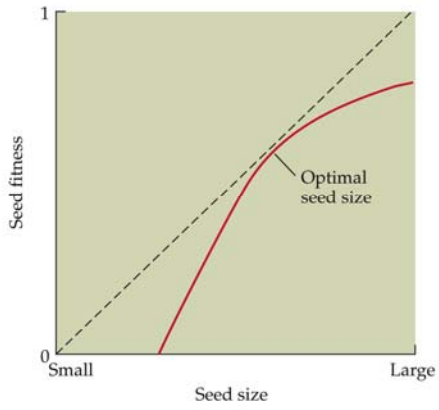
Life histories

8.1 *Digitalis purpurea* is a biennial—a short-lived monocarpic perennial

8.2 Finding the seed size that maximizes the fitness of the maternal plant

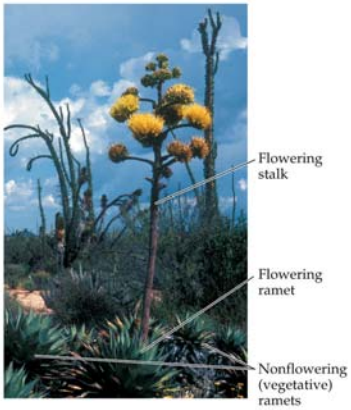


8.3 *Helianthus annuus* is an annual plant cultivated for seeds, but also has many wild populations

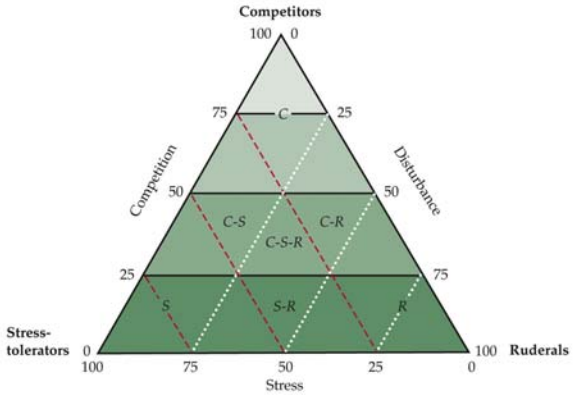
8.4 *Arabidopsis thaliana* is a small annual mustard

8.5 *Cirsium canescens* is a "biennial"

8.6 *Agave* has semelparous rosettes that flower only once



8.7 Grime's triangular or *C-S-R* model



8.8 Grime's characterizations of large groups of plants according to his *C-S-R* model

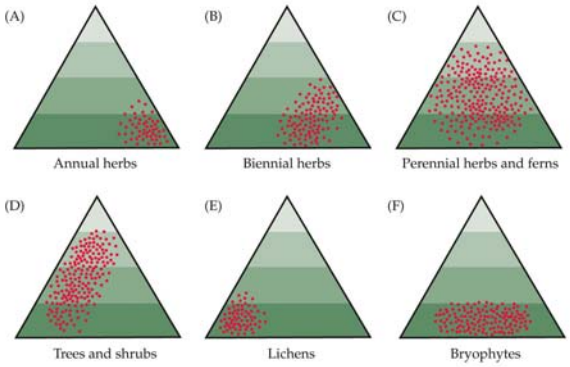
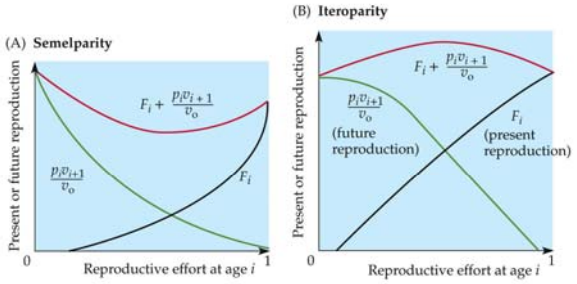


TABLE 8.1 Some characteristics of competitive, stress-tolerant, and ruderal plants, as described in Grime's triangular model

	Competitive	Stress-tolerant	Ruderal
Growth forms	Perennial herbs, shrubs, or trees	Lichens, perennial herbs, shrubs, and trees	Annuals
Seed production	Small	Small	Large
Maximum potential growth rate	Rapid	Slow	Rapid
Leaf litter	Abundant, often persistent	Little, often persistent	Little, not persistent
Leaf longevity	Short	Long	Short
Flowering phenology	Flowering near time of maximum productivity	No pattern	Flowering at end of favorable period
Vegetative phenology	Leaf production coincides with maximum productivity	Evergreens; various patterns	Brief period of leaf production at time of maximum productivity
Life span	Long	Long	Short

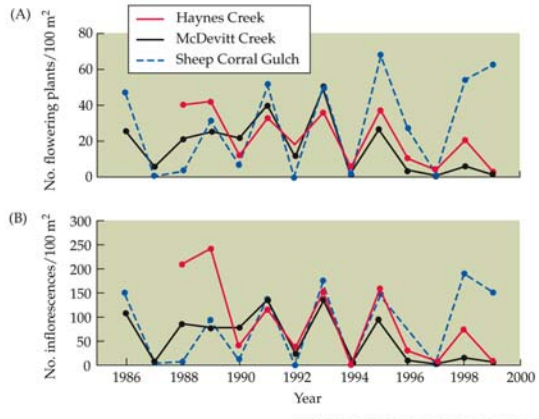
Source: Grime 1977.

8.9 Selection for semelparity versus iteroparity

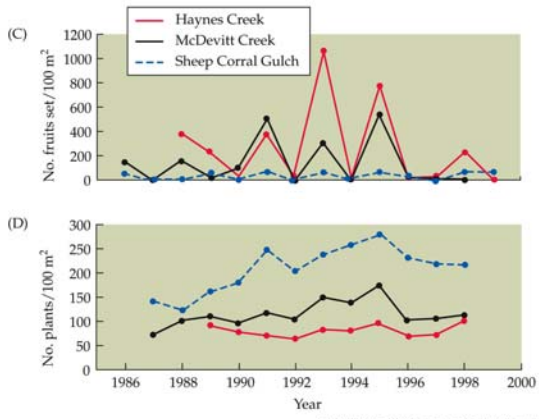


8.10 *Eschscholzia californica* has two unusual, but unrelated, features of its life history

8.11 Reproductive synchrony in *Astragalus scaphoides* in 3 populations in Idaho and Montana (1)



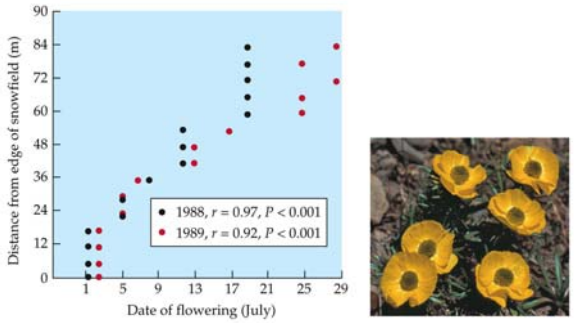
8.11 Reproductive synchrony in *Astragalus scaphoides* in 3 populations in Idaho and Montana (2)



8.11 Reproductive synchrony in *Astragalus scaphoides* in 3 populations in Idaho and Montana (3)

8.12 *Larix* is a deciduous conifer found in taiga around the world

8.13 *Ranunculus adoneus* is found in alpine snowfields in the Rocky Mountains



8.14 *Eriogonum abertianum* is an annual plant of the Sonoran and Chihuahuan Deserts

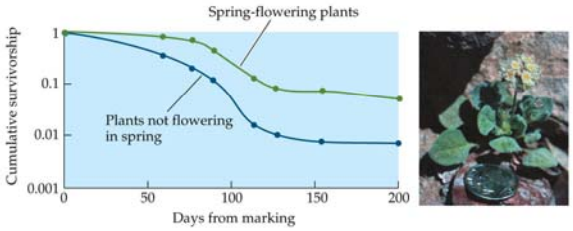


TABLE 8.2 Frequencies and sizes of spring-flowering classes of *Eriogonum abertianum* in several populations

Site and year	Plants alive in spring that flowered in spring (%)	Mean (standard error) height to highest node		*n*
		Spring flowerers	Non-spring flowerers	
Chihuahuan Desert				
Portal, 1985	2.6	4.4 (0.58)	2.2 (0.05)	494
Portal, 1986	2.6	4.8 (0.43)	1.7 (0.03)	1404
Sierra, Vista 1986	0.0	—	1.3 (0.04)	200
Sonoran Desert				
Tucson Mts., 1986	56.7	2.8 (0.10)	1.7 (0.06)	201
Waterman Mts., 1986	31.0	4.2 (0.43)	2.0 (0.05)	200
Organ Pipe, 1985	21.3	2.5 (1.9)	1.5 (0.06)	150
Organ Pipe, 1986	23.1	3.1 (0.7)	1.7 (0.02)	1382

Source: Data from Fox 1992.

Note: More plants flower in spring in the Sonoran Desert (which receives less rain, and less predictable rain, in the summer) than in the Chihuahuan Desert. Spring-flowering plants are larger on average, and have improved chances of surviving to summer (see Figure 8.14), even when compared with same-sized plants (Fox 1989). Moisture availability, as well as size, strongly influences phenological variation within populations; the differences between the Portal and Organ Pipe populations, at least, have a strong genetic basis (Fox 1990a).