

FASES DO CICLO VEGETATIVO (Extraídas de FAO Irrigation and Drainage Paper nº 56)

| Crop | Init. (L _{ini}) | Dev. (L _{dev}) | Mid (L _{mid}) | Late (L _{late}) | Total | Plant Date | Region |
|--------------------------------------------------------|------------------------------|-----------------------------|----------------------------|------------------------------|--------|--------------|---------------------|
| a. Small Vegetables | | | | | | | |
| Broccoli | 35 | 45 | 40 | 15 | 135 | Sept | Calif. Desert, USA |
| Cabbage | 40 | 60 | 50 | 15 | 165 | Sept | Calif. Desert, USA |
| Carrots | 20 | 30 | 50/30 | 20 | 100 | Oct/Jan | Arid climate |
| | 30 | 40 | 60 | 20 | 150 | Feb/Mar | Mediterranean |
| | 30 | 50 | 90 | 30 | 200 | Oct | Calif. Desert, USA |
| Cauliflower | 35 | 50 | 40 | 15 | 140 | Sept | Calif. Desert, USA |
| Celery | 25 | 40 | 95 | 20 | 180 | Oct | (Semi)Arid |
| | 25 | 40 | 45 | 15 | 125 | April | Mediterranean |
| | 30 | 55 | 105 | 20 | 210 | Jan | (Semi)Arid |
| Crucifers ¹ | 20 | 30 | 20 | 10 | 80 | April | Mediterranean |
| | 25 | 35 | 25 | 10 | 95 | February | Mediterranean |
| | 30 | 35 | 90 | 40 | 195 | Oct/Nov | Mediterranean |
| Lettuce | 20 | 30 | 15 | 10 | 75 | April | Mediterranean |
| | 30 | 40 | 25 | 10 | 105 | Nov/Jan | Mediterranean |
| | 25 | 35 | 30 | 10 | 100 | Oct/Nov | Arid Region |
| | 35 | 50 | 45 | 10 | 140 | Feb | Mediterranean |
| Onion (dry) | 15 | 25 | 70 | 40 | 150 | April | Mediterranean |
| | 20 | 35 | 110 | 45 | 210 | Oct; Jan. | Arid Region; Calif. |
| Onion (green) | 25 | 30 | 10 | 5 | 70 | April/May | Mediterranean |
| | 20 | 45 | 20 | 10 | 95 | October | Arid Region |
| | 30 | 55 | 55 | 40 | 180 | March | Calif., USA |
| Onion (seed) | 20 | 45 | 165 | 45 | 275 | Sept | Calif. Desert, USA |
| Spinach | 20 | 20 | 15/25 | 5 | 60/70 | Apr; Sep/Oct | Mediterranean |
| | 20 | 30 | 40 | 10 | 100 | November | Arid Region |
| Radish | 5 | 10 | 15 | 5 | 35 | Mar/Apr | Medit.; Europe |
| | 10 | 10 | 15 | 5 | 40 | Winter | Arid Region |
| b. Vegetables – Solanum Family (Solanaceae) | | | | | | | |
| Egg plant | 30 | 40 | 40 | 20 | 130\14 | October | Arid Region |
| | 30 | 45 | 40 | 25 | 0 | May/June | Mediterranean |
| Sweet peppers (bell) | 25/30 | 35 | 40 | 20 | 125 | April/June | Europe and Medit. |
| | 30 | 40 | 110 | 30 | 210 | October | Arid Region |
| Tomato | 30 | 40 | 40 | 25 | 135 | January | Arid Region |
| | 35 | 40 | 50 | 30 | 155 | Apr/May | Calif., USA |
| | 25 | 40 | 60 | 30 | 155 | Jan | Calif. Desert, USA |
| | 35 | 45 | 70 | 30 | 180 | Oct/Nov | Arid Region |
| | 30 | 40 | 45 | 30 | 145 | April/May | Mediterranean |
| c. Vegetables – Cucumber Family (Cucurbitaceae) | | | | | | | |
| Cantaloupe | 30 | 45 | 35 | 10 | 120 | Jan | Calif., USA |
| | 10 | 60 | 25 | 25 | 120 | Aug | Calif., USA |
| Cucumber | 20 | 30 | 40 | 15 | 105 | June/Aug | Arid Region |
| | 25 | 35 | 50 | 20 | 130 | Nov; Feb | Arid Region |
| Pumpkin, Winter squash | 20 | 30 | 30 | 20 | 100 | Mar, Aug | Mediterranean |
| | 25 | 35 | 35 | 25 | 120 | June | Europe |
| Squash, Zucchini | 25 | 35 | 25 | 15 | 100 | Apr; Dec. | Medit.; Arid Reg. |
| | 20 | 30 | 25 | 15 | 90 | May/June | Medit.; Europe |
| Sweet melons | 25 | 35 | 40 | 20 | 120 | May | Mediterranean |
| | 30 | 30 | 50 | 30 | 140 | March | Calif., USA |
| | 15 | 40 | 65 | 15 | 135 | Aug | Calif. Desert, USA |
| | 30 | 45 | 65 | 20 | 160 | Dec/Jan | Arid Region |
| Water melons | 20 | 30 | 30 | 30 | 110 | April | Italy |
| | 10 | 20 | 20 | 30 | 80 | Mat/Aug | Near East (desert) |

* Lengths of crop development stages provided in this table are indicative of general conditions, but may vary substantially from region to region, with climate and cropping conditions, and with crop variety. The user is strongly encouraged to obtain appropriate local information.

¹ Crucifers include cabbage, cauliflower, broccoli, and Brussel sprouts. The wide range in lengths of seasons is due to varietal and species differences.

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| d. Roots and Tubers | | | | | | | |
| Beets, table | 15 | 25 | 20 | 10 | 70 | Apr/May | Mediterranean |
| | 25 | 30 | 25 | 10 | 90 | Feb/Mar | Mediterranean & Arid |
| Cassava: year 1 | 20 | 40 | 90 | 60 | 210 | Rainy | Tropical regions |
| year 2 | 150 | 40 | 110 | 60 | 360 | season | |
| Potato | 25 | 30 | 30/45 | 30 | 115/130 | Jan/Nov | (Semi)Arid Climate |
| | 25 | 30 | 45 | 30 | 130 | May | Continental Climate |
| | 30 | 35 | 50 | 30 | 145 | April | Europe |
| | 45 | 30 | 70 | 20 | 165 | Apr/May | Idaho, USA |
| | 30 | 35 | 50 | 25 | 140 | Dec | Calif. Desert, USA |
| Sweet potato | 20 | 30 | 60 | 40 | 150 | April | Mediterranean |
| | 15 | 30 | 50 | 30 | 125 | Rainy seas. | Tropical regions |
| Sugarbeet | 30 | 45 | 90 | 15 | 180 | March | Calif., USA |
| | 25 | 30 | 90 | 10 | 155 | June | Calif., USA |
| | 25 | 65 | 100 | 65 | 255 | Sept | Calif. Desert, USA |
| | 50 | 40 | 50 | 40 | 180 | April | Idaho, USA |
| | 25 | 35 | 50 | 50 | 160 | May | Mediterranean |
| | 45 | 75 | 80 | 30 | 230 | November | Mediterranean |
| | 35 | 60 | 70 | 40 | 205 | November | Arid Regions |
| e. Legumes (<i>Leguminosae</i>) | | | | | | | |
| Beans (green) | 20 | 30 | 30 | 10 | 90 | Feb/Mar | Calif., Mediterranean |
| | 15 | 25 | 25 | 10 | 75 | Aug/Sep | Calif., Egypt, Lebanon |
| Beans (dry) | 20 | 30 | 40 | 20 | 110 | May/June | Continental Climates |
| | 15 | 25 | 35 | 20 | 95 | June | Pakistan, Calif. |
| | 25 | 25 | 30 | 20 | 100 | June | Idaho, USA |
| Faba bean, broad bean | 15 | 25 | 35 | 15 | 90 | May | Europe |
| | 20 | 30 | 35 | 15 | 100 | Mar/Apr | Mediterranean |
| | 90 | 45 | 40 | 60 | 235 | Nov | Europe |
| | 90 | 45 | 40 | 0 | 175 | Nov | Europe |
| Green gram, cowpeas | 20 | 30 | 30 | 20 | 110 | March | Mediterranean |
| Groundnut | 25 | 35 | 45 | 25 | 130 | Dry season | West Africa |
| | 35 | 35 | 35 | 35 | 140 | May | High Latitudes |
| | 35 | 45 | 35 | 25 | 140 | May/June | Mediterranean |
| Lentil | 20 | 30 | 60 | 40 | 150 | April | Europe |
| | 25 | 35 | 70 | 40 | 170 | Oct/Nov | Arid Region |
| Peas | 15 | 25 | 35 | 15 | 90 | May | Europe |
| | 20 | 30 | 35 | 15 | 100 | Mar/Apr | Mediterranean |
| | 35 | 25 | 30 | 20 | 110 | April | Idaho, USA |
| Soybeans | 15 | 15 | 40 | 15 | 85 | Dec | Tropics |
| | 20 | 30/35 | 60 | 25 | 140 | May | Central USA |
| | 20 | 25 | 75 | 30 | 150 | June | Japan |

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| f. Perennial Vegetables (with winter dormancy and initially bare or mulched soil) | | | | | | | |
| Artichoke | 40 20 | 40 25 | 250 250 | 30 30 | 360 325 | Apr (1 st yr) May (2 nd yr) | California (out in May) |
| Asparagus | 50 90 | 30 30 | 100 200 | 50 45 | 230 365 | Feb Feb | Warm Winter Mediterranean |
| g. Fibre Crops | | | | | | | |
| Cotton | 30 45 30 30 | 50 90 50 50 | 60 45 60 55 | 55 45 55 45 | 195 225 195 180 | Mar-May Mar Sept April | Egypt; Pakistan; Calif. Calif. Desert, USA Yemen Texas |
| Flax | 25 30 | 35 40 | 50 100 | 40 50 | 150 220 | April October | Europe Arizona |
| h. Oil Crops | | | | | | | |
| Castor beans | 25 20 | 40 40 | 65 50 | 50 25 | 180 135 | March Nov. | (Semi)Arid Climates Indonesia |
| Safflower | 20 25 35 | 35 35 55 | 45 55 60 | 25 30 40 | 125 145 190 | April Mar Oct/Nov | California, USA High Latitudes Arid Region |
| Sesame | 20 | 30 | 40 | 20 | 100 | June | China |
| Sunflower | 25 | 35 | 45 | 25 | 130 | April/May | Medit.; California |
| i. Cereals | | | | | | | |
| Barley/Oats/ Wheat | 15 20 15 40 40 20 20 ² 30 160 | 25 25 30 30 60 50 60 ² 140 75 | 50 60 65 40 60 60 70 40 75 | 30 30 40 20 40 30 30 30 25 | 120 135 150 130 200 160 180 240 335 | November March/Apr July Apr Nov Dec December November October | Central India 35-45 °L East Africa Calif. Desert, USA Calif., USA Mediterranean Idaho, USA |
| Grains (small) | 20 25 | 30 35 | 60 65 | 40 40 | 150 165 | April Oct/Nov | Mediterranean Pakistan; Arid Reg. |
| Maize (grain) | 30 25 20 20 30 30 | 50 40 35 35 40 40 | 60 45 40 40 50 50 | 40 30 30 30 30 50 | 180 140 125 125 150 170 | April Dec/Jan June October April April | East Africa (alt.) Arid Climate Nigeria (humid) India (dry, cool) Spain (spr, sum.); Calif. Idaho, USA |
| Maize (sweet) | 20 20 20 30 20 | 20 25 30 30 40 | 30 25 50/30 30 70 | 10 10 10 10 ³ 10 | 80 80 90 110 140 | March May/June Oct/Dec April Jan | Philippines Mediterranean Arid Climate Idaho, USA Calif. Desert, USA |
| Millet | 15 20 | 25 30 | 40 55 | 25 35 | 105 140 | June April | Pakistan Central USA |
| Sorghum | 20 20 | 35 35 | 40 45 | 30 30 | 130 140 | May/June Mar/April | USA, Pakis., Med. Arid Region |
| Rice | 30 30 | 30 30 | 60 80 | 30 40 | 150 180 | Dec; May May | Tropics; Mediterranean Tropics |

continued...

- ² These periods for winter wheat will lengthen in frozen climates according to days having zero growth potential and wheat dormancy. Under general conditions and in the absence of local data, fall planting of winter wheat can be presumed to occur in northern temperate climates when the 10-day running average of mean daily air temperature decreases to 17° C or December 1, whichever comes first. Planting of spring wheat can be presumed to occur when the 10-day running average of mean daily air temperature increases to 5° C. Spring planting of maize-grain can be presumed to occur when the 10-day running average of mean daily air temperature increases to 13° C.
- ³ The late season for sweet maize will be about 35 days if the grain is allowed to mature and dry.

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| j. Forages | | | | | | | |
| Alfalfa, total season ⁴ | 10 | 30 | var. | var. | var. | | last -4°C in spring until first -4°C in fall |
| Alfalfa ⁴ , 1 st cutting cycle | 10 10 | 20 30 | 20 25 | 10 10 | 60 75 | Jan Apr (last -4°C) | Calif., USA. Idaho, USA. |
| Alfalfa ⁴ , other cutting cycles | 5 5 | 10 20 | 10 10 | 5 10 | 30 45 | Mar Jun | Calif., USA. Idaho, USA. |
| Bermuda for seed | 10 | 25 | 35 | 35 | 105 | March | Calif. Desert, USA |
| Bermuda for hay (several cuttings) | 10 | 15 | 75 | 35 | 135 | --- | Calif. Desert, USA |
| Grass Pasture ⁴ | 10 | 20 | -- | -- | -- | | 7 days before last -4°C in spring until 7 days after first -4°C in fall |
| Sudan, 1 st cutting cycle | 25 | 25 | 15 | 10 | 75 | Apr | Calif. Desert, USA |
| Sudan, other cutting cycles | 3 | 15 | 12 | 7 | 37 | June | Calif. Desert, USA |
| Sugarcane, virgin | 35 50 75 | 60 70 105 | 190 220 330 | 120 140 210 | 405 480 720 | | Low Latitudes Tropics Hawaii, USA |
| Sugarcane, ratoon | 25 30 35 | 70 50 105 | 135 180 210 | 50 60 70 | 280 320 420 | | Low Latitudes Tropics Hawaii, USA |
| l. Tropical Fruits and Trees | | | | | | | |
| Banana, 1 st yr | 120 | 90 | 120 | 60 | 390 | Mar | Mediterranean |
| Banana, 2 nd yr | 120 | 60 | 180 | 5 | 365 | Feb | Mediterranean |
| Pineapple | 60 | 120 | 600 | 10 | 790 | | Hawaii, USA |
| m. Grapes and Berries | | | | | | | |
| Grapes | 20 20 20 30 | 40 50 50 60 | 120 75 90 40 | 60 60 20 80 | 240 205 180 210 | April Mar May April | Low Latitudes Calif., USA High Latitudes Mid Latitudes (wine) |
| Hops | 25 | 40 | 80 | 10 | 155 | April | Idaho, USA |
| n. Fruit Trees | | | | | | | |
| Citrus | 60 | 90 | 120 | 95 | 365 | Jan | Mediterranean |
| Deciduous Orchard | 20 20 30 | 70 70 50 | 90 120 130 | 30 60 30 | 210 270 240 | March March March | High Latitudes Low Latitudes Calif., USA |
| Olives | 30 | 90 | 60 | 90 | 270 ⁵ | March | Mediterranean |
| Pistachios | 20 | 60 | 30 | 40 | 150 | Feb | Mediterranean |
| Walnuts | 20 | 10 | 130 | 30 | 190 | April | Utah, USA |
| o. Wetlands - Temperate Climate | | | | | | | |
| Wetlands (Cattails, Bulrush) | 10 180 | 30 60 | 80 90 | 20 35 | 140 365 | May November | Utah, USA; killing frost Florida, USA |
| Wetlands (short veg.) | 180 | 60 | 90 | 35 | 365 | November | frost-free climate |

⁴ In climates having killing frosts, growing seasons can be estimated for alfalfa and grass as:
alfalfa: last -4°C in spring until first -4°C in fall (Everson, D.O., M. Faubion and D.E. Amos 1978. "Freezing temperatures and growing seasons in Idaho." Univ. Idaho Agric. Exp. station bulletin 494. 18 p.)

grass: 7 days before last -4°C in spring and 7 days after last -4°C in fall (Kruse E.G. and Haise, H.R. 1974. "Water use by native grasses in high altitude Colorado meadows." USDA Agric. Res. Service, Western Region report ARS-W-6-1974. 60 pages)

⁵ Olive trees gain new leaves in March. See footnote 24 of Table 12 for additional information, where the K_c continues outside of the "growing period".

Primary source: FAO Irrigation and Drainage Paper 24 (Doorenbos and Pruitt, 1977), Table 22.