http://www.GeoChemBio.com:

Glycine max, soybean, soya bean, soja bean, Manchurian bean

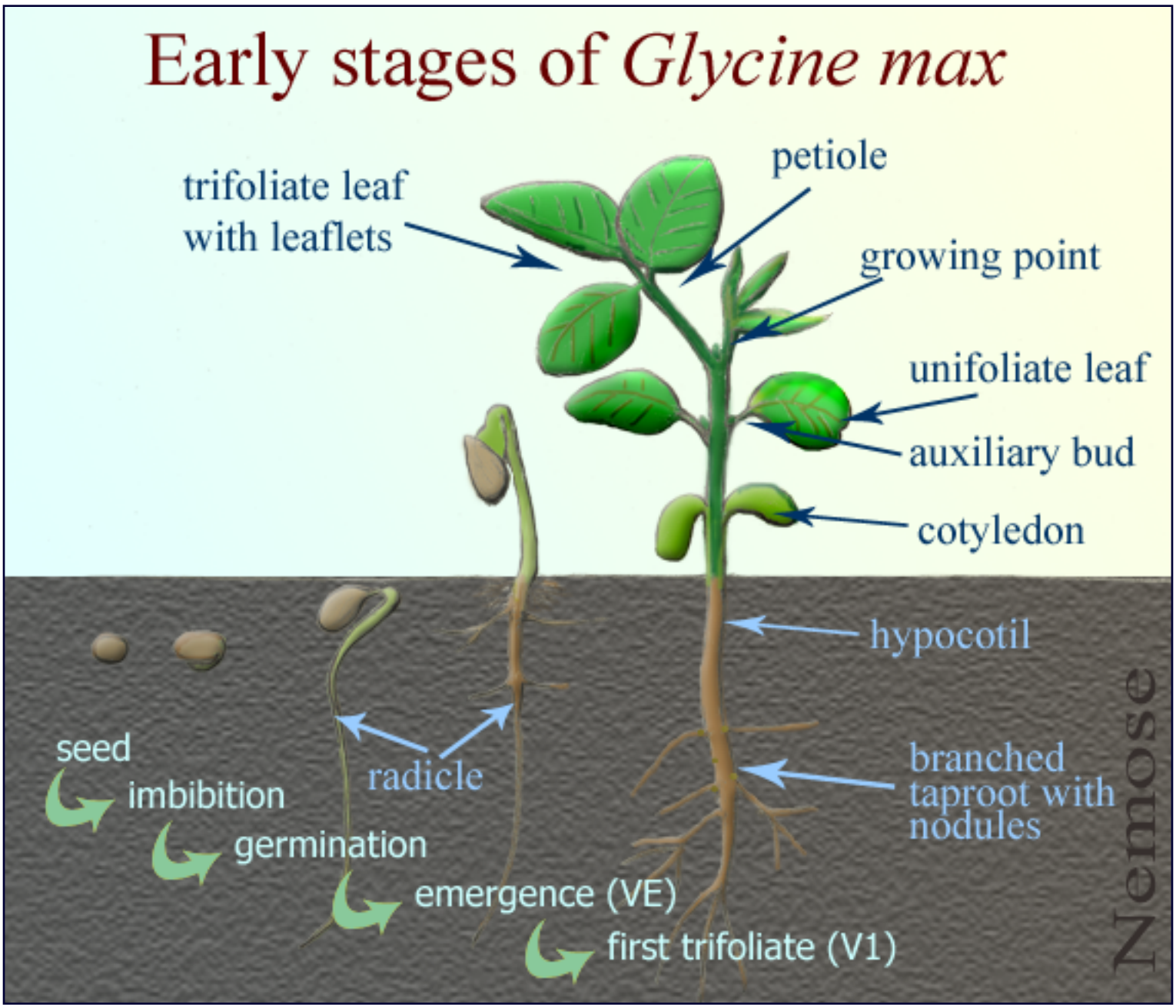
Taxonomy

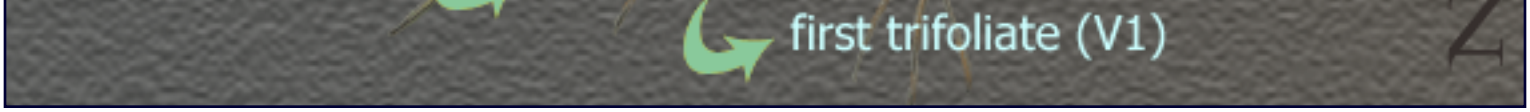
cellular organisms - Eukaryota - Viridiplantae - Streptophyta - Streptophytina - Embryophyta - Tracheophyta - Euphyllophyta - Spermatophyta - Magnoliophyta - eudicotyledons - core eudicotyledons - rosids - eurosids I - Fabales - Fabaceae - Papilionoideae - Phaseoleae - Glycine - Glycine max

Brief facts

- Annual summer herb up to 1 m high, usually erect though some varieties twine. The plant is entirely covered with fine brown or grey hair.
- Cultivated soybean, *Glycine max* (L.) Merr., is a diploidized tetraploid (2n=40).
- Soybean is grown primarily for the production of seed, has a multitude of uses in the food and industrial sectors, and represents one of the major sources of edible vegetable oil and of proteins for livestock feed use.
- Soybean is commonly considered one of the oldest cultivated crops, native to North and Central China. The oldest recording of soybeans made by emperor of China, Sheng Nung, is dated by the year 2838 B.C.

- Soybeans contain 37-40% proteins and 18-22% fat, most of which is represented by essential fatty acids. Rest of soybeans' content consists of carbohydrate - mostly oligosaccharides and fiber.
- Soybeans and a majority of soy-enriched foods are rich in **isoflavones**. Isoflavones (so-called **phytoestrogens**) are compounds that structurally similar to the human estrogen (estradiol) but much less potent due to weaker affinity with estrogen receptor (ER). Because of this similarity, isoflavones have been suggested to prevent many kinds of hormone-dependent diseases such as breast and prostate cancer, obesity, post-menopausal syndrom, and several others. Also concerns were raised that due to their estrogenic activity excess of isoflavones may lead to infertility in men, hypothyroidism, liver and other diseases. So far most of these claims were not robustly supported by *in vitro* as well as *in vivo* experiments.





Developmental stages (life cycle)

Life Cycle Stages

- seed

  A soybean plant can produce as many as 400 pods, with two to twenty pods at a single node. Each pod contains one to five seeds.

  MeSH

  - dormant seed
  - germinating seed **MeSH**

- vegetative

  also called V-stages; V stages after VC are defined and numbered by the upper, fully-developed leaf node on the main stem

  - seedling **MeSH**

    first 2 weeks after planting

    - emergence

      VE stage, 5-10 days after planting

    - cotyledon stage

      VC stage, begins when cotyledons (embryonic leaves) are fully expanded, lasts for about 7-10 days during which cotyledons supply the nutrient needs of the young plant

        - trefoil

          V1, first trifoliolate stage, first trifoliolate is fully emerged and opened; V stages will now begin appearing around every three to five days through V5

    - second node

      active nitrogen fixation from the bacteria is just beginning to occur; plant age is about 20-25 days

    - third node

      plant is about 7-9 inches tall with four nodes (three unfolded leaflets)

    - fourth node

      V4 stage

    - fifth node

      V5; V5 is about 1 week from R1 or first flower; the total number of nodes that the plant can produce is established

    - sixth node

      V6 stage; plants are 12-14 inches tall with 7 nodes with unfolded leaflets; unifoliolate and cotyledons may have senesced from the plant

- reproductive
    - flowering
        - early flowering

R1 stage, first flower; plant is 15-18 inches tall and structured as a V7-V10 palnt; flowering always initiates on the third to sixth node and progresses up and down

- full bloom stage

R2 stage; an open flower is seen at one of the two top nodes of the main stem; the plant has accumulated about 25% of its total dry weight and has obtained about 50% of its mature height

- pod development
  - late flowering

R3 stage, beginning pod stage; plants can be up to 23-32 inches tall and can be at the V11-V17 stage; a pod on the upper four nodes is 3/16 inch long

  - full pod stage

R4 stage; rapid pod growth; beginning of seed development

- seed development
  - beginning seed stage

R5, the plant at this stage has seed at least 1/8 inch long in one of the pods on one of the four upper nodes of the main stem; about halfway through this stage, the plant attains its maximum height and node number

  - full seed stage

R6 stage; green bean stage; stage initiates with a pod containing a green seed that fills the pod cavity on at least one of the four top nodes of the main stem; after this stage rapid leaf senescing begins

- ripening

plant maturation

  - beginning maturity

R7 stage; one mature pod (brown or tan in color)

  - mature

R8 stage; full maturity stage; 95% of pods on the plant are mature

References

PubMed articles

- **Free full text articles in PubMed: major topic "Soybeans"**

Websites

- **Soybean Growth and Management Quick Guide**
- **Reproductive Soybean Development and Soybean Aphid Thresholds (University of Wisconsin - Extension)**

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