Source: Wheat|Land & Water| Food and Agricultural Organization of the United Nations (fao.org)

Watch out for:

- Copper deficiency in wheat. Seeds must be dressed in copper oxychloride
- Field and storage pests.

Bread and durum wheat (*Triticum aestivum and T. turgidum*) were domesticated in the Near and Middle East. Present world production is about 582.7 million tons from 213.8 million ha.(FAOSTAT, 2001).

The crop is grown as a rainfed crop in temperate climates, in the sub-tropics with winter rainfall, in the tropics near the equator, in the highlands with altitudes of more than 1500 m, and in the tropics away from the equator where the rainy season is long and where the crop is grown as a winter crop.

Wheat is grown under irrigation in the tropics either in the highlands near the equator or in the lowlands away from the equator. In the subtropics with summer rainfall, the crop is grown under irrigation in the winter months. In the subtropics with winter rainfall, it is grown under supplemental irrigation.

The length of the total growing period of spring wheat ranges from 100 to 130 days while winter wheat needs about 180 to 250 days to mature. Day length and temperature requirements are key factors in variety selection. Varieties can be grouped as winter or spring types according to chilling requirements, winter hardiness, and day length sensitivity. Winter wheat requires a cold period or chilling (vernalization) during early growth for normal heading under long days. Winter wheat in its early stages of development exhibits strong resistance to frost, down to - 20°C. The resistance is lost in the active growth period in spring and during head development and flowering periods frost may lead to head sterility. Because of this sometimes more damage is done to the winter crop by spring frost than by winter frost.

In areas of severe winters, cold winds, and little snow, spring wheat varieties are grown. Spring wheat does not require chilling for heading and it is day neutral. However, it is also sensitive to frost. For winter and spring wheat minimum daily temperature for measurable growth is about 5°C. The mean daily temperature for optimum growth and tillering is between 15 and 20°C. The occurrence of (spring) frost is an important factor in the selection of a sowing date. A dry, warm ripening period of 18°C or more is preferred. Mean daily temperatures of less than 10 to 12°C during the growing season make wheat a

hazardous crop. Knowledge of genetic characteristics and particularly the growth and development pattern of wheat varieties is essential for meeting the combination of various climatic requirements for growth development and yield formation.

The crop can be grown on a wide range of soils but medium textures are preferred. Peaty soils containing high sodium, magnesium, or iron should be avoided. The optimum pH ranges from 6 to 8. For good yields, the fertilizer requirements are up to 150 kg/ha N, 35 to 45 kg/ha P, and 25 to 50 kg/ha K.

Wheat is relatively tolerant to a high groundwater table; for sandy loam to silt loam a depth of groundwater of 0.6 to 0.8 m can usually be tolerated, and for clay 0.8 to 1 m. For short periods the crop can withstand without visible harm a minimum depth of 0.25 m. With a rise of the groundwater table to 0.5 m for long periods the yield decrease is 20 to 40 percent.

The crop is moderately tolerant to soil salinity but the ECe should not exceed 4 mmhos/cm in the upper soil layer during germination. Yield decrease due to salinity is 0% at ECe 6.0, 10/ at 7.4, 25% at 9. 5, 50% at 13, and 100% at ECe 20 mmhos/cm.

With pre-irrigation or sufficient rain to wet the upper soil layer, seeds are drilled 2 to 4 cm deep. as against 5 to 8 cm in dry soils, so that light showers will not cause the seeds to germinate. Under favorable water supply including irrigation and adequate fertilization row spacing is 0.12 to 0.15 m (450 to 700000 plants/ha) but increases to 0.25 m or more under poor rainfall conditions (less than 200000 plants/ha). Sowing rates under irrigation are 100 to 120 kg/ha (drilled) to 110 to 140 kg/ha (broadcast). Wheat is often grown in rotation and legumes, sunflowers and maize are considered suitable rotation crops.