

## Dry Beans

### **Environmental Stress**

Includes cool soils, strong wind and wind-blown dust, hail, flooding, intense sunlight, high temperature during rapid vegetative growth or flowering.

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### **Part of Plant Affected**

Leaves, branches, stem, flowers, pods

### **Factors Favoring Disease Development**

Damage from environmental problems is determined by weather phenomena.

### **Symptoms & Management**

**Cool soil temperature** at planting will delay germination and result in reduced stand, especially where poor quality seed has been used. The optimum temperature for bean seed germination is 68°F. When soils are cool and wet the potential for injury from preplant soil incorporated herbicides and infection by root rot pathogens increases.

Avoid planting into cool soil because stand establishment from carryover seed, low moisture seed, seed with low germination percentage and mechanically damaged seed will be reduced when planted into cool soils. If you must plant this reduced quality seed, use it when soil temperatures are 68° F or higher and treat it with appropriate pesticides.

Cool soil temperature extends the time the hypocotyl of a germinating seedling is in contact with a soil incorporated herbicide.

Cool soil temperature coupled with wet soils increase seed rot and development of weakened seedlings that are more susceptible to disease stress.

**Strong wind, wind-blown soil particles, and hail damage** bean tissue by causing abrasion, tearing, or shredding of leaves; by aborting buds, blossoms and young pods; by lodging entire plants; by breaking branches and stems; and by physically pulling and

moving plants, thus shearing roots. Strong winds will move beans that are in windrows ready for threshing.

Hail accompanied by wind and rain also injure plant tissue and cause water soaking of large areas of injured tissue. Pathogenic bacteria enter injured tissue easily, and are spread throughout the field by the force of the wind driven rain.

Storm damage response: strong winds, wind-blown soil particles, and hail damage bean tissue by causing abrasion, tearing, or shredding of leaves; aborting buds, blossoms and young pods; lodging entire plants; breaking branches and stems; or physically pulling and moving plants, thus shearing roots. Hail accompanied by wind and rain may also injure plant tissue and cause water soaking of large areas of injured tissue. Pathogenic bacteria may enter this tissue easily, and can be spread throughout the field by the force of the wind. The amount of crop damage caused by hail depends on the intensity, duration and size of hail stones as well as the plant growth habit and its stage of development. Severe hail can reduce stands and delay crop maturity.

The amount of crop damage caused by hail depends on the intensity, duration and size of hail stones as well as the plant type and its stage of development. Severe hail can reduce stands and delay crop maturity. Regardless of type, plants have more time to recover and may have less yield reduction when injured earlier rather than later in the season.

Irrigate severely damaged plants as soon as possible, regardless of rainfall received during a storm. Storm-damaged plants are often less able to absorb soil moisture because of a shear-damaged root system and loss of large quantities of water through wounded foliage.

Replant only if absolutely necessary and feasible. If replanting after June 15, use an early maturing variety. All bacterial disease management procedures must be followed because of the increased risk of spreading these pathogens throughout the field to be replanted.

**Flooded (oxygen-stressed) plants** occur on soils with poor drainage, from heavy rain, over-irrigation, and/or a leaky irrigation pipe. These plants have a nonthrifty or stunted appearance with yellowish foliage and are prone to develop severe root rot.

**Intense sunlight**, especially following conditions of high humidity and cloud cover, scald or burn bean leaves, branches, stems and pods.

**High temperatures** during rapid vegetative growth together with recent cultivation and delay of subsequent irrigation result in marginal leaf burn or a complete browning and dropping of lower leaves. High temperature, during flowering, above 95° F daytime or 80° F nighttime result in blossom drop and reduce pod set. These conditions will be most noticeable on hot sandy soil, and south and southwest facing slopes.

Maintain normal irrigation practices, or shorten the interval between each irrigation.

Low temperature (frost) during seed fill stages can freeze plant parts and seed, causing death of tissue, water-soaking and discoloration of seed after drying is completed. In addition to discoloration, frozen beans may exhibit a musty odor.

Categories: Dry beans, Environmental stress

Date: 04/01/2007