

# Lettuce Seed Germination

## Cultural Information



### **Suggestions for the Storage and Sowing of Rijk Zwaan Lettuce Seed**

#### **Seed Storage**

Whether normal or pelletised seed is being stored, the longevity can be increased by maintaining stock in a conventional refrigerator. Do not freeze. If refrigerated storage is not available, short shelf-life lines should be stored at temperatures of less than 15 degrees.

#### **High Temperature Dormancy of Lettuce Seed**

High temperature dormancy in seed can be described as the inability of seed with an otherwise normal germination rate, to emerge at high temperatures.

Optimum temperatures for lettuce germination are approx. 16 – 20 c. Even at very low temperatures (down to 1c) lettuce seed still germinates, although emergence will be much slower than in the optimum range. From temperatures higher than 20c (minimum temperature) usually the germination rate will be reduced, especially if the night time as well as the day time temperatures are higher than the optimum.

The "thermogradient" germination (ability to germinate at various temperatures) of a seed lot is determined by various factors, as listed below:

- Variety sensitivity
- Origin and age of the seed lot
- Day/night temperature differential
- Duration of the high temperature period
- Light (in some varieties only)
- Seed age
- Production history
- Priming.

The main one is the genetic sensitivity to thermodormancy.

It is generally acknowledged that high temperatures will inhibit germination only once the seed has been more or less fully imbibed (saturated with water). Temperatures during the first few days after sowing are therefore critical. How long this sensitive period is depends on temperatures during water uptake by the seeds. At high temperatures water uptake is quick and the seeds will be prone to high temperature dormancy from only a few hours after sowing. Once the radicle has emerged high temperatures will no longer cause dormancy.

#### **A few simple precautions will reduce the risk of thermo-dormancy:**

- Sow early in the morning while the seedling mix is still cool. Alternatively sow late afternoon to obtain benefit of imbibition at lower night time temperatures
- Use cool water to soak the trays
- Cover the trays with polystyrene sheets (20mm thick) and place them in a cool area.
- Remove the sheets as soon as the first seedlings start to emerge! (2-3 days) keep the trays moist during the whole germination process.

If temperatures are really extreme (on most varieties a night temperature of higher than 24c) a pre-sowing treatment may be required.

### **Thermocure ® Treatment**

Rijk Zwaan supplies lettuce seed which has received the thermocure treatment. This treatment improves the germination under high temperature conditions; it overcomes high temperature dormancy ( thermo-dormancy or secondary dormancy) in most cases. This has resulted in virtually no reported problems in regard to lettuce seed germination.

The down side is that this treatment reduces the shelf-life of the seed. Given that most seed lines will germinate well up to 6 months after the expiry date, it is reasonable not to anticipate many problems. However when ordering it is worthwhile to check the use by date if seeds are to be sown over an extended period.

### **Steps Leading to Germination:**

- Sow in conventional media, such as peat moss and vermiculite, water tray and allow to remain at ambient temperature for at least 2 hours to permit imbibition. The germination process has just commenced. It is important that the seed is fully imbibed before transfer to the cold room, otherwise problems with uneven emergence or even poor germination may be experienced.
- Many nurseries employ dark cold rooms, primarily to break dormancy in normal (non – thermocure) seed. Trays should be retrieved from the darkened room in the afternoon after the day of sowing ie nearly 2 days. Temperature in the cold room is normally maintained at 5 – 6 degrees celsius. If seed is kept too long in a dark cold room, emergence and etiolation of the hypocotyl (shoot) may occur. This whole step can be avoided by using thermocured seed or by sowing in cool weather.
- In an ideal situation, sown trays are placed in a germination room after steps 1 or 2. They are held at 18 to 20 degrees celsius for 48 hours. They are then moved to the greenhouse.
- If going directly from step 1 to the greenhouse, sowing should be conducted in the cool of the early morning and insulated well as described above. Sowing in the late afternoon permits imbibition during the cool of the evening. Emergence of the shoot and radicle can then proceed under warmer daytime temperatures the following day.

### **Variation exists between varieties and even between seed lots within a nominated variety in regard to germination requirements.**

An approximation of an optimum germination temperature is 18 degrees for thermocured seed. Even at a temperature of 21 degrees, some problems may be encountered. There may be a degree of compensation by a large variation in day and night temperatures. Other factors, such as the water – air ratio of the media, can also play a role.

### **Achieving optimum germination in direct sown Baby Leaf lettuce**

Baby leaf lines are normally direct sown in a field situation at high density ie. at a spacing of approximately 1-2 cm. The crop is harvested when 10-15 cm high. Seed of baby leaf varieties are primed, depending on the specific germination characteristic of the relevant seed batch. Please note that the shelf life of primed baby lettuce seed is normally quite short.

Our recommendation is to only sow when a soil temperature of 15 degrees C or less can be maintained for a period of 8 hours or more immediately following sowing. Late afternoon sowing is suggested as an option for achieving the best result under ambient conditions.

The above comments are intended as approximate guidelines. Experimentation with consideration of the other variables that come into play is required before optimum, consistent results are obtained.

It is suggested that consideration be given to engaging the services of a professional seedling nursery.

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