

An overview on the optimal methods of cultivating chickpea (*Cicer arietinum* L.) at negative temperatures

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ABSTRACT:

The advantages of winter planting of chickpea cultivation (*Cicer arietinum* L.) has led the selectivity of cold tolerant lines to be very important. Considering the large number of chickpea germplasm stored in seed banks, the appropriate diversity is available for selection of tolerant varieties. However, achieving this goal needs to design an appropriate screening program. In this regard, the different studies have already been conducted to investigate the possibility of selection of cold tolerant lines in the field, greenhouse and *in vitro* by using various selective criteria such as viability, assessing the damage, electrolyte leakage, TTC test and biochemical markers. Evaluating the results of these studies show that each of these methods has its advantages and disadvantages and accordingly it seems that in selectivity program in the early stages of selection that the number of samples is high, the techniques based on *in vitro* planting and TTC selection criteria are more appropriate for selectivity. In the later stages that the number of samples decreases due to the selection, the methods such as selection in the controlled conditions and selection in the field by using the selection criteria such as viability can be used, respectively.

Keywords:

Selectivity, cold tolerance, chickpea