1. In Cumin germination begins with imbibition of water and this increase in moisture content activates enzymic systems involved in the breakdown of complex reserves into simpler substances which are then utilised for the growth of the embryo axis. Increasing activities of peroxidase, catalase, protease and RNase with progress in germination helps in the degradation of various reserves and consequently contents of RNA and proteins also decrease.

2. Throughout the life cycle of the plant upto fertilized carpel stage, a declining trend of sugars was observed suggesting utilization of sugars as substrates for increased respiration as well as AA biosynthesis.

3. AA and AA utilization increases which suggest its important role during germination. AA-FR-peroxidase activity also increases accelerating the formation of free-radicals of AA which ultimately trigger the entire metabolism and seedling growth.

CONCLUSIONS
4. The increased AA-FR-peroxidase and increased DNA result in the increase of charge-transfer-complex (CTC) formation which ultimately leads to an increased electronic energy and thus biosynthesis of all metabolites increases which culminates in better growth and development of the plant.

5. Growth, development and metabolic activities are intimately correlated with each other and also with the pretreatments.

6. Synthesis of AA, AA utilization and complexing with macromolecules increases during the flower bud stage as compared to vegetative shoot apex stage and senescence phase, whereas ASG content decreases releasing more AA for rapid development. Activities of peroxidase, AA-FR-peroxidase, catalase, protease and RNase also increase, synchronizing with accelerated synthesis of proteins, histones and nucleic acids at the time of induction. These enzymic and metabolic activities are accelerated to a greater degree under 70°D + AA + H₂O₂ followed by other pretreatments compared with that in control.
7. Ascorbic acid and SH contents show similar trends which support the protective role of -SH towards AA or vice versa. Synchronous increase in SH with increase in enzymic reactions also suggests the importance of SH for the enzymes.

8. 70\(^\circ\)D + AA + \(H_2O_2\) followed by other pretreatments of the seeds increase AA and its utilization as well as enzymic activities. It is followed by an increase in vital cell metabolites like RNA, DNA as well as proteins. This is in conformity with the AA- NA- protein metabolism concept for growth and development.

9. The stimulation is also seen by pretreatments on anthesis, flower production and seed ripening date. As the plants of pretreated seed enter senescence, the ripening period is prolonged. 1000 kernel weight is therefore more.

10. The presowing treatment of seeds resulted not only in higher grain yields but it has given a protection against fungal disease. Thus these findings have an important bearing upon practical problems of crop production.

11. Large scale field trials of pretreated seed (70\(^\circ\)D + AA + \(H_2O_2\)) have given promising results and increase in growth vigour as well as in yield to the extent of 30-50% have been recorded for pretreated seed over that of the control.