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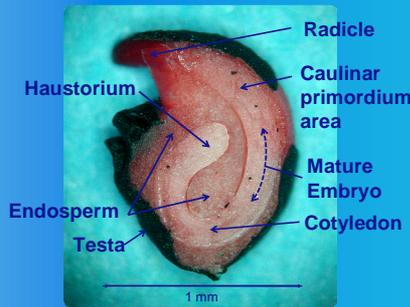
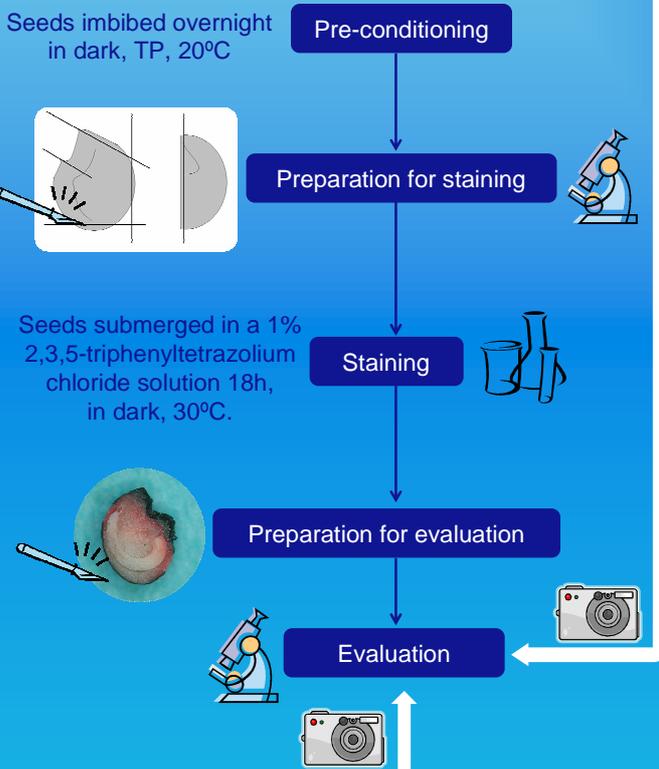
INTRODUCTION

The main objective of this work is to assess Topographical Tetrazolium (TZ) testing in *Allium* spp., especially in onion (*Allium cepa* L.) seeds, by providing result evaluation image support for a more consistent interpretation of TZ staining. TZ test was firstly developed by Lakon (1949), and sixty years later still needs to be improved in *Allium* genus. Image assistance during seed evaluation can make this technique more reproducible.

MATERIALS AND METHODS

Two seed lots of local varieties of onion from Galicia (Spain) were analyzed by TZ viability and vigor tests and conventional germination tests. Seed vigor was also estimated through the first count of the standard germination test.

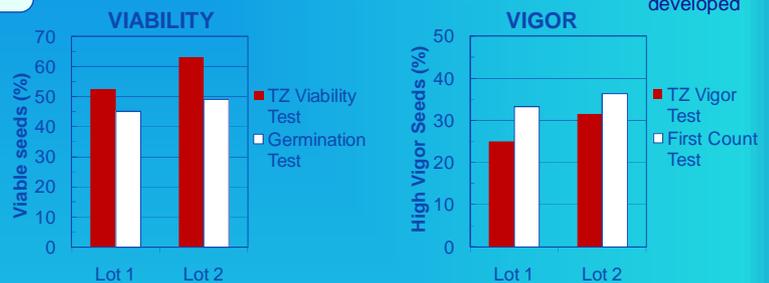
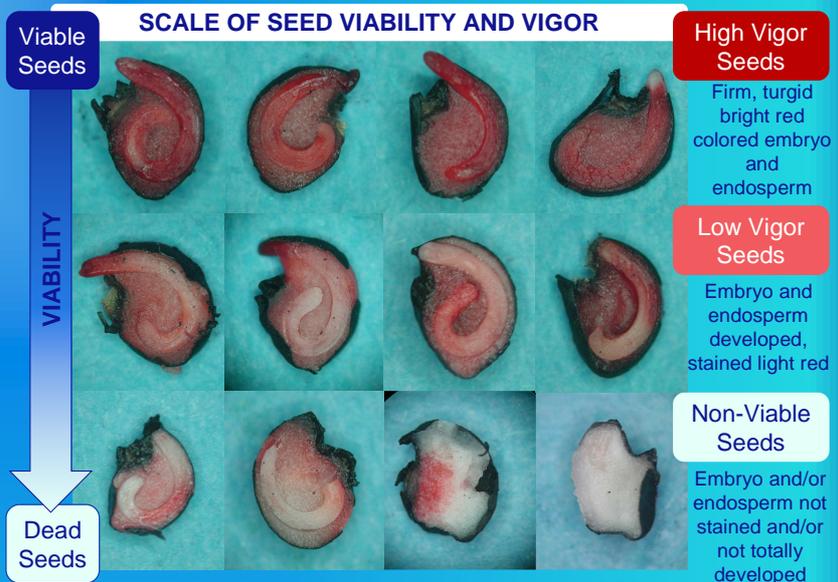
Germination tests were performed following ISTA rules (ISTA, 1993) for onion seeds. **TZ testing** was conducted following the Tetrazolium Testing Handbook (Moore, 1985):



TZ test measures the relative respiration rate of cells, on the basis of the activity of dehydrogenase enzymes. When tissues are alive, these enzymes react with the colorless TZ salt solution, which is changed into red formazan, staining in red alive tissues. Seed viability and vigor can be interpreted according to the topographical staining pattern and the intensity of the coloration.

RESULTS

TZ test evaluation was made by comparison of the staining of every single seed analyzed with the viability and maturity images scale obtained previously. A good correlation between viability and vigor TZ tests and germination test results was found in both onion seed lots, proving the efficiency of the image scale established to evaluate viability and vigor in onion seeds.



SCALE OF EMBRYO MATURITY



DISCUSSION

TZ viability and vigor seed testing in *Allium* genus still needs to be improved. In *Allium* spp. seeds, all tissues are vital. Thus, TZ testing reveals to be more difficult than in other genus. Longitudinal cut through the embryo as a new preparation for staining method could be a solution to shorten and help in TZ testing, but still has to be investigated.

TZ vigor testing is a highly subjective method when no literature documented methodologies and image support for result interpretation is used. Image analysis using mechanical detection systems can be developed and could be nowadays a solution to make TZ viability and vigor testing more reproducible and objective.

Analysis of vigor by TZ staining patterns could be a great help to contribute studying viability loss and ageing of onion seeds: analyzing a small seed sample, the potential viable seed percentage can be estimated in two days.

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