The Germination of Legume Crops to Understand Seed Longevity

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THE WORLD FOOD PRIZE

INTRODUCTION

For my research I conducted germination test on soybeans as well as mung beans so gain a better understanding of their seed longevity. The longevity of seeds varies depending on the crop, some have longer seed lifespan than others. The seeds that have a shorter seed longevity decline earlier and have to be regenerated more often. Soybeans have a reputation for having a shorter seed longevity, unlike mung beans which are known to have longer ones. The main claim for my research is to see if the seeds are a affected at all by being kept in storage for a certain amount of time, and if they how long should they be kept in storage before needing to be regenerated.

METHOD

My research uses the experimental design structure of RCBD which stands for randomized complete block design. The experimental method of germination test more specifically the paper technique. To start off you have to collect all the seeds from the different storage units. The soybean seeds were pulled from the medium term storage unit while the mung beans were pulled from the short term storage unit. Once the seeds have been pulled they must be organized and sorted out by year and replication. The next step is to conduct the moisture test, but the moisture test only needs to be conducted on one replication per year. After that is completed I moved on to completing the actual germination test. Once they are finished the accessions are placed in a incubator, where the will checked on after seven days of incubating. Throughout the seven days the replications get taken out once or twice to add more water into the cups. After seven days have passed the replications are taken out of the incubator and analyzed to figure out how many are healthy, abnormal, or dead.

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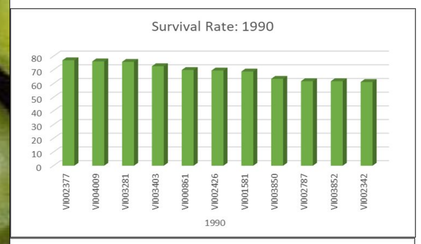
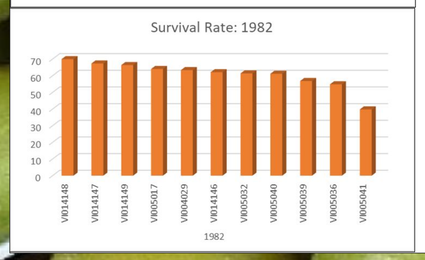
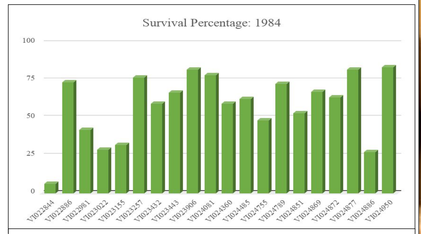
GRAPHS

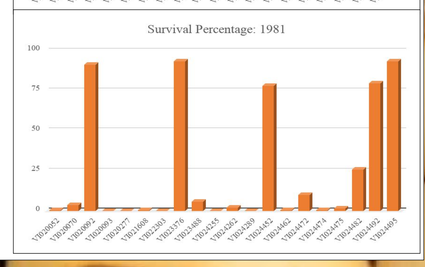
Mung Beans





Soybeans





RESULTS

Soybeans:

Going into the experiment it was expected that the later years like 1984, 1989 were going to have the higher survival. Unlike 1978 where it was expected that the survival rate was going to lower and 1981 was going to be somewhere in middle. These assumptions were drawn due to the fact that soybeans are known for having lower survival percentages if it is kept in storage for a longer period of time. The poorest seed survival percentages resulted in 1981 and 1989, which were expected to have a higher outcome. Unlike, the years 1984 and 1978 which ended up having the best seed survival percentage rates.

Mung Beans:

Beginning the experiment it was expected that the mung beans would have a more steady result pattern. It was expected that the results would be on the higher side of seed viability, due to mung beans having a better reputation with germination test. 1990 had the highest average at 69.50 its results were steady and did not drop to low. The year 1975 is close second with a average of 67.76, in similarity with 1990 its results were steady and never dropped to low. Now 1982 had a average of 60.85 and it did drop to the lowest point out of the three years at one point.

CONCLUSION

High moisture content results only partially explains how the results were produced for 1978 and 1984, but they did not explain the results composed for the 1981 and 1989. Prior handling of the seeds before entering into storage could also be a factor. The outcomes of the mung beans came out as expected. The results were mostly high and steady, there were a few drops but not often and not that low. The mung beans lived up to their reputation of being more stable. One conclusion that can be made is that seed viability is not related to the duration of seed storage. Along with, seed moisture content does play a role just not a dominant one. The overall main conclusion is that previous seed handling does play a important role in seed viability.

ACKNOWLEDGEMENTS

A special thanks for Ambassador Kenneth M. Quinn, Ms. Crystal Harris and the rest of the World Food Prize. A huge thanks to Dr. Maarten van Zonneveld, Ms. Miao-rong Yan, Mr. Yung-kuang Huang and the rest of the GRSU staff, along with the rest of the World Vegetable Center.