ACIDITY CHANGES IN STORED LEGUME SEEDS

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While making a study of agricultural seeds as carriers of legume bacteria, it was noted that, as a rule, seeds several years old had fewer legume bacteria on them than fresh seeds. Two causes were thought to contribute to this condition. On one hand, desiccation is known to reduce greatly the germ content of soil and it may reduce it on seeds. On the other hand, aging of seeds may produce products that act as germicides. Some preliminary tests indicated that legume seeds several years old were more acid than fresh seeds. Acidity studies were made, therefore, of legume seeds of varying ages, hoping that the resulting data might offer an explanation for the fact that older seeds as a rule have fewer legume bacteria on them than fresh seeds, and also suggest an explanation for the repeated failures to get satisfactory inoculation from stored artificially inoculated seeds.

It is possible that not only the surface but also the interior of the seeds may change in acidity during storage. Preliminary tests in which the whole seeds and a meal made from the seeds were tested for acidity after three minutes and after twenty minutes in contact with water indicated that the meal gave more consistent pH readings than the whole seeds. The seed surfaces undoubtedly carry extraneous materials which may vary somewhat with every sample that is being tested. To reduce this possible irregularity to a minimum, seeds were prepared for acidity tests by grinding. To 10 grams of the meal was added about 20 cc of boiled distilled water which had been cooled over soda-lime. This usually made a slush. After standing three minutes readings were made by means of the quinhydrone-platinum electrode.

Early in 1928 legume seeds of various species were collected. No effort was made to learn their previous storage conditions. Only the year in which they were supposed to have been grown was recorded. Undoubtedly, some of the seed were drier than others at the beginning of storage and some were stored in a drier situation than others. These conditions govern respiration which in turn contributes to the aging of seeds. Thus it is logical to expect some irregularities when one is trying to class the seed samples as old or as fresh when designating them by years.

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