

THE VIGOR TESTING CONTROVERSY

Charles C. Baskin ^{1/}

Differences in vigor among seed lots have been observed for quite a few years. Some seed produce a stand under adverse field conditions while others do not; some seed produce a stand much faster than others; some seed produce a much more uniform stand than others; plants from one lot of seed may grow faster and even in some cases yield more than plants from another lot when planted in the same field and under the same conditions. All of above describe the performance of seed of different vigor levels, as described by researchers. Differences in seed performance may be due to differences in the seed. Quite possibly they are due to differences in seed quality or vigor.

There are a number of different factors that can affect the quality of seed. A discussion of these would be quite lengthy and involved. It suffices to say that differences in seed lots do exist and can be measured.

Researchers have devoted many hours to the study of vigor or quality; what determines quality, how to measure it, and what are the results of reduced vigor or low quality in terms of plant performance. Numerous workers have very accurately measured differences in seed vigor in the laboratory and in the field. Several laboratory methods have been developed to measure differences in seed quality or vigor. Many papers have been published describing these methods and documenting the results of experiments that have successfully demonstrated the effects of seed vigor on seed germination, seedling growth, plant development and in some cases, yield.

One can take a number of lots of seed into a research or testing laboratory and, with the proper equipment and knowledge of how to conduct and interpret tests, array these several lots in order from high vigor to low vigor if differences in vigor exist. This can be done with several different tests for many seed kinds. These different tests will give within tolerance levels the same relative rank or rating to this group of seed lots. Absolute values may, and in many instances will, vary. Variation in results does not mean that the tests are not valid and, therefore, of no value in determining seed quality.

Different researchers working with the same or similar tests have developed different methods and ratings. Farmers and seedsmen have heard and read about these studies. They have sought to benefit from this research and are now beginning to do so. It is absolutely necessary, when using any of these tests, that the test methods and interpretation of results be the same as described by the research worker,

^{1/} Extension Agronomist-Seed and Grain, MCES, MSU

otherwise the same results and applications cannot be expected. Varying conditions of tests, equipment and/or interpretation may make a great difference in results and meaning of results.

Most of the questions not yet answered by research lie in the area of the relationship between laboratory tests for vigor and field performance. This area is under investigation. Some work has been completed and within the next few years information should be available concerning some of the more widely planted species; cotton, soybeans, etc.

As vigor testing has emerged from the research laboratories and found its way into the seed processing plant, the seed testing laboratory and on the farms, a lot of misunderstandings, apprehension and mixed emotions about when, how, where, and if vigor tests should be used have emerged also. There is, as should be expected, some misuse of vigor testing and vigor test information by those who really don't understand what they are doing. This is true of many things, new or old. Everyone must know what they are doing and how to use the information or they will get into trouble!

One of the primary objections, given by seedsmen, to vigor testing, is that, "Vigor tests are not standardized, therefore there can be no repeatability of tests from one laboratory to another." It is true that tests are not standardized but this should not deter the use of vigor tests. Standard germination tests, are "standardized" but repeatability is often a problem from one laboratory to another, even within the same laboratory when seed quality is marginal. A case in point; some seedsmen will get as many as five or six germination tests on the same lot of seed from several different laboratories. It is possible for these germination tests on the same sample to vary considerably, especially when quality is marginal. Getting a truly representative sample is sometimes very difficult. Also, there may be differences in interpretation of normal and abnormal seedlings, especially when an analyst doesn't conduct many tests on a particular kind of seed.

Since there are different vigor tests offered, variations in methods of conducting these tests and variations in their interpretation, how can they be used? Each laboratory conducting vigor tests should be able to give an interpretation of their results. Even though a more definite relationship between laboratory tests results and field performance needs to be established for widespread testing, results of the tests can now be generally related to field performance. Seedlings or seed lots can be classified as strong, average, marginal or poor; for example, suitable or not suitable for planting. Such information could be very valuable to farmers if it was available to them. The same information could be very useful to seedsmen in a marketing program. It could prevent the marketing of marginal or poor quality lots of seed, the lots that bring complaints and create problems.

Another strong objection to vigor testing is that it may be required for labeling purposes. It is highly questionable that this will

or should occur. It seems better to use vigor testing in the quality control and marketing programs not regulatory programs. Seed firms could designate their high quality seed in some way, use this in sales promotion, thus making available high quality seed with an established vigor level available to those that want them and are willing to pay for them. The remainder of the seed could be sold on the same basis that seed are sold at present. High quality seed should command a premium price the same as other high quality products. Some seedsmen are using this approach with soybeans and seem to be well pleased with their efforts.

Another objection to vigor testing expressed by some seedsmen has been the establishment of a differential pricing program and, "what happens when you can't supply "high vigor" seed?" First, vigor testing doesn't create a differential pricing program greater than that already being used. Most seedsmen currently sell certified and several grades of non-certified seed and/or different classes of certified seed. Adding premium quality, high vigor seed only adds one more item.

As far as supply is concerned, not every farmer will want to pay a premium price for high quality seed. It's also true that in some years there may not be enough to supply the demand but this is true with most products of this nature. When high quality seed are in short supply and a farmer has to buy another grade at least he will know that the seed are of average quality and can plan accordingly.

Another approach to marketing would be for the originator to make results of vigor tests on lots of seed available on request. However, this doesn't appear to be as good a marketing tool as designating the high quality seed.

Most of the "unrest" or concern about seed vigor testing appears to be unjustified. More people need to investigate the problems and potentials in detail before becoming alarmed. Farmers need to realize vigor testing isn't going to solve all their problems, rather recognize it as another management tool. Seedsmen must realize that it isn't going to put them out of business nor is it going to eliminate all of their problems. It's only one more decision making and merchandizing tool which can be used to increase service and profit potentials.