

## VIM, VIGOR, VITALITY

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By definition, Vim = strength; Vigor = intensity of action; and Vitality = power of enduring. Thus, if we utilize these terms to describe seed, we mean that the seed are strong with powerful action and endurance. More commonly in the Seed Industry such seed are called high quality seed - or seed of high vigor.

The quality level of seed may be expressed as a rating or degree of excellence which seed possess only when compared to an acceptable standard. Therefore, seed may possess high, medium or low vigor depending upon the criterion used for classifying them.

Attributes of seed quality are numerous --- appearance, uniformity, germination, mechanical purity, insect and disease contamination, degree of injury, stage of maturity, degree of deterioration and, no doubt, many others. Some of these seed quality attributes are routinely evaluated in standardized laboratory tests, while others are more difficult to routinely assess. However, with the rapid changes in seed production technology during the past few years, it has become increasingly important to employ a series of seed quality tests to truly evaluate the real quality/vigor potential of seeds.

Until recently it was generally considered that the quality condition of planting seed merely influenced the initial stages of seed germination, field emergence and final stand survival. Indeed, in the seed bed environment, seed of low to medium quality (vigor) often germinate, emerge and survive at a lower rate as compared to high quality (vigor) seed. In addition, however, substantial data has been accumulated which indicates that the initial seed quality condition, influences the entire growth pattern of seed plants, including the final

Yield increases associated with high quality (vigor) seed vary with crop kind and year, and increases reported have been as low as 5 percent and as great as 30 percent. Detailed investigations with corn have shown that high quality seed gave a 21% and 12% yield increase for 1971 and 1972, respectively. Yield increases from high quality rice seed were 33 % and 38% in 1971 and 1974, respectively. High quality sorghum seed produced a 15% yield increase in 1971. Each yield increase is that above seed of the same variety but lower in quality (vigor).

Additional studies show that corn plants from low quality (vigor) seed have reduced ear weight, increased barren plants and reduced

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yields at both 58,000 and 38,000 plants per hectare (Table 1). Also, specific gravity investigations with rice seed have shown that seed of greater specific gravity (higher quality/vigor) produce plant populations which give better yields of higher bushel weight (Table 2).

Numerous research results substantiate the fact that high quality seed produce superior plants of greater competitive ability. Conversely, low quality seed may contribute to plant stands but not crop performance.

In summary, studies with corn, rice, sorghum and cotton have shown that low vigor seed cause the following problems in stands of seed bearing plants: delayed and reduced emergence; small plants with thin stems, fewer nodes and reduced leaf area; reduced tillering; delayed panicle exertion and reduced panicle length; delayed anthesis; increased barren plants; delayed maturity; and decreased yield.

Table 1. Influence of Corn Seed Vigor on Plant Performance.

<u>Vigor</u>	<u>%Barren</u>		<u>Ear Weight (g)</u>		<u>Kg/Ha (000)</u>	
	<u>58M</u>	<u>38M<sup>1/</sup></u>	<u>58M</u>	<u>38M</u>	<u>58M</u>	<u>38M</u>
High	8	2	124	164	5.5	5.7
Medium	12	1	115	161	5.1	5.4
Low	11	7	106	142	4.5	4.5

<sup>1/</sup>Plants per Hectare 58,000, 38,000

Table 2. Influence of Specific Gravity of Rice Seed on Yield And Bushel Weight.

<u>Sp. Gr.</u>	<u>Relative Yield %</u>		<u>Bu. Wt.</u>	
	<u>1971</u>	<u>1974</u>	<u>1971</u>	<u>1974</u>
CK	100	100	41	39
1.00 - 1.05	68	83	39	39
1.05 - 1.13	90	87	40	39
1.13 - 1.20	100		42	40
1.20 <sup>+</sup>	114	128	43	42