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# REVIEW ON SURVIVAL ANALYSIS OF THE WHEAT GERMINATION DATA

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***Abstract:***

*In the present work, review of different types of wheat varieties, the study determined that farmers' preference towards a variety was not only determined by itsyield but also by other traits of importance. The study has an implication in the farmer-oriented extension andresearch program for suggesting farmers the most suitable variety in the area. Focusing to the farmers' preferred traits during the development and distribution of the wheat varieties would increase the likelihood of adoption of the varieties. The performance of the varieties released after semi dwarf wheat were introduced in India and various genetic stocks developed for different component traits was found below par across all the three years of evaluation. The varieties from warm and humid central areas of India, did not perform to their potential when grown in northwestern plains which experience high temperatures during grain filling.*

*The environmental conditions and the quantitative nature of the chapati quality did not auger well with the set of genotypes tested however, better and stable performance of the tall traditional varieties. C 306 the wheat variety released in 1965 for cultivation has remained the best quality genotype over the years and was also established from this study. The present study provides an established base for further studies on understanding the basis of chapati making quality of wheat. The knowledge generated during this study can be utilized for developing wheat genotypes with excellent end use quality. The area and productivity was indicating stable growth in wheat crop in almost all the districts and divisions of Maharashtra state. Thus, it indicates that the wheat was cultivated traditionally in the region during rabi season. Hence, there is a scope to increase the production of wheat, especially in Maharashtra state by providing high yielding varieties and improved technology.*

*A correlation was set up between biochemical parameters and sensory characters of chapatti quality and hence the overall quality of product. Depending on the quality measurements and sensory score, C306, HD2687, GW381, HW2004, PBW175 and WH912 were categorized into good chapatti varieties and HD2189, HUW598, NI5439, WH291, SONAK, and UAS410 were grouped into poor chapatti performance wheat varieties.*

## To study effect of gamma irradiation on germination percentage and chlorophyll variation in Pigeon pea (*Cajanascajan*) *L*. variety Maroti (150Gys), Daftari (150Gys) and Charu (150Gys)

**Introductions:** Pigeon Pea (*Cajanascajan (L.*) Millsap) belongs to the genus Cajanas, subtribe – Cajaninae, tribe-Phascoleae, order- Fables, Family-Fabaceae and subfamily-Faboideae . S everal edible beans like lablab, Dolichos, Phaseolus, Vigna and Cajanas come under tribe Phascoleae but in the SubtribeCajaninae, only one species, Cajanascajan Has been domesticated and cultivated.

The term 'Pigeon pea' was coined in Barbados, where its Seeds were considered on important Pigeon-Feed (Gowda*et al*., 2011). Pigeon pea or red gram or tur is known by several Vernacular names in India viz. Tur (Maharashtra and GujratArthar (west Bengal), Kandi (Andhra Pradesh), Heard (Haryana and some parts of western Uttar Pradesh), Rahat (parts of Bihar), Tuvaraparippu (Kerala), kokh-lan tribes of trip Ural, Abhaki and Tvarika (Sanskrit). The Total cultivated of pigeon pea is about 6.22. million hectare and global annual crop production is around 7.74 million tonnes, whereas total Seed Production of this crop is about 0.15 million tonnes (FAO STAT, 2013). It seeds area an excellent source of good quality Protein.

Nutrition is the most important basic need, being a major determinant of health, labour productivity, and mental development. But in most developing countries of the world, hunger and malnutrition are increasing due to population explosion, shortage of fertile land, and high food prices FAO (1980) Pelletier *et al*. [1995]. With high protein content, along with energy values and important vitamin and mineral content, legumes have been recognised for their nutritional importance Vadivel and Janardhanan [2005] Among legumes, Pigeon pea (*Cajanascajan L*.) is predominantly grown and consumed in India.mutagen (Hajara, 1979) and typically produces only point mutations (Okagaki et al., 1991). change important components of plant cells. They have been reported to affect differentially the morphology, anatomy, biochemistry and physiology of plants depending on the radiation dose (Ashraf *et al*., 2003).

**Introduction:**

Wheat is the world's most important food crop on account of its production and consumption (Shewry and Tatham, 1994). With the totalproduction of more than 72 million tones, India is the second largest wheat producing country after China. Over 85% of the total wheat produced in India is consumed in the form of chapatti and itsculinary variations (Mishra *et. al.*, 1998). With huge consumption volume and urbanization of societies, chapatti promises to be the top selling processed product of 21st century (Bedekar, 2001).

Chapatti overall quality is monitored by various parameters like color, taste, freshness, softness, mouth feel, tearing force etc. Thesequality characteristics of chapatti are mainly controlled by quality of wheat used and processing conditions for converting it into finished product (Navnidhi*et al.,* 2006). There are some intrinsic and inherent factors which distinguish superior chapattimaking variety from poor chapatti producing variety. Therefore understanding of wheat grain quality and flour quality, responsible for quality chapatti is of keeninterest.In this study, an efforthas been made to distinguish the good and poor wheat varieties depending on their performance for chapatti formation.

Germination has three phase's water absorption (imbibition), activation and visible germination. Germination is one of the most crucial physiological processes that allow plants toestablish in a particular environment. Germination experiments are carried out in several fields of biological science.

This means that wheat grains are susceptible to pre-harvest sprouting in eastern Hokkaido where wheat grains develop under relatively high humidity and cool temperatures, especially

after rainfall. Damage due to pre-harvest sprouting caused by a low temperature is a substantial problem in this region (Amano *et al.,* 1999; Osanai and Amano, 1999). The flour of the grains damaged by pre-harvest sprouting has a maximum viscosity (MV) in amylography below 300 BU and is unsuitable for industrial processing. Many studies have shown that endosperm starch degraded by a-amylase activity may adversely affect the quality of flour for noodles (Yasunaga*et al*., 1963; MacGregor and Matsuo, 1972; MacGregor and Dushnicky, 1989; Salomonsson*et al.,* 1989; Matsuzaki and Toyoda, 1996). The degradation of endosperm protein caused by endoproteasemaygreatly contribute to the deterioration in bread-making quality (Preston *et al.,* 1978; Lukow*et al.,* 1984; Janssen *et al.,* 1996; Weegels*et al.,* 1996).

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Wheat (*Triticumaestivum*L.) is a cereal grain, originally from the Levant region of the near east and Ethiopian Highlands, but now cultivated worldwide. It is grown in diversified environments. It is a staple food of millions of people. Approximately one-sixth of the total arable land in the world is cultivated with wheat, whereas paddy is mainly cultivated in Asia, wheat is grown in all the continents of the world. It supplies about 20 per cent of the food calories for the world's growing population. Global wheat production touched 753.4 million tons in 2016-17. India is the second largest producer of wheat after China. Wheat has a distinct place among the food grain crops. Carbohydrate and protein are two main constituents of wheat. On average wheat contains 11-12 per cent carbohydrate. The major aim was to analyze the genotypes for their agronomic characteristics and to study their quality attributes in one environment.

The main purpose of this study is to estimate district wise growth rates of area, production and productivity of wheat varieties in Maharashtra, to workout district wise instability of wheat, to access trends in area, production and productivity and to estimate relative contribution of area and yield to change in the output of wheat varieties in Maharashtra. Several research workers have worked on the problem in different regions. This chapter takes brief account of research works in growth, instability, trend and decomposition of output growth of wheat varieties in Maharashtra.

**Material and Methods:** Data were collected from various research papers, various government publications, data books and reviewed for investigation for better quality with good characteristics in the entire region of India to guide the farmer for the most economical and suitable variety of wheat plant the particular area.

**Discussion:**

Beher and Sharma (1991) concluded that wheat cv.HD-2285 grown in rabi winter and demonstrated that yield differences were most closely related to spikes m-2,while spike weight, number and weight of grains spike-1and number of fertile spikelet's spike-1also increased with increasing fertilizer rates. Grain yields increased with increase in N rate from 2.37 t with 37 kg N to 2.80 t with 120 kg N ha-1(Bhoi*et al*., 1993).

The rate of protein synthesis is initially high, with approximately 50% of the total storage proteins synthesized in the first 20 days after anthesis (Simmonds, 1978). Fourteen days after anthesis, nearly 25% of total grain N is in the gliadin fractions, In contrast, the percentage of glutenins increases 25 days after anthesis (Dexter and Dronzek, 1975b; Ng et al., 1991).

The glutenins are polymeric proteins resulting from intermolecular disulfide bonds (Schofield, 1994; Gianibelli et al., 2001). After treatment with a reducing agent, the glutenins can be subdivided into high molecular sub-unit proteins (HMW-GS; 100-140 kDa) and low molecular sub-unit proteins (LMW-GS; 30-75 kDa) (Gianibelli et al., 2001). High polymorphism for both HMW-GS and LMW-GS coding genes have been reported in both bread and durum wheat (Payne *et al*., 1983; Gupta and Shepherd, 1990a, 1990b; Branlard*et al*., 1989).

In a study on bread wheat (CV. Sakha 69) and durum wheat (cv. Storks) it was found that grain yield increased with increasing irrigation frequency and N rate (Dawood and Kheiralla, 1994).In an experiment consisting of soft red winter wheat and four N levels and observed, kernel number per head increased and individual kernel weight decreased with increasing nitrogen (Frederick and Camberato, 1994).With increasing rate of N fertilizer up to 140 Kg ha-1significantly increased water use efficiency, grain yield, grain protein content and total protein yield, while capacity for N uptake decreased. It was also concluded that grain yields could be improved by application of 100-140 kg N ha-1(Abderrazak*et al.,* 1995).

Singh and Ranjan (1998) studied the growth and instability in production of principle food-grain crops: a case of backward economy. The study of instability indicated that, wheat, maize and arhar witnessed a continuous decline in instability over the period under study. The decline in stability in the production of these crops has been caused mainly by adoption of improved technology in crop production. The spectacular growth in production was associated with increase in instability but it started declining after the perfection in technology.

The prolamins represent the largest portion of the wheatstorage proteins and are classified into two groups, the gliadins and glutenins, according to their solubility in aqueous/alcohol solutions (Shewry and Tatham, 1990). Gliadins are a mixture of monomeric polypeptides (Sapirstein and Fu, 1998) and glutenins consist of polypeptides aggregated by disulphide bonds (ShewryandTatham, 1990; Singh and MacRitchie, 2001). The gliadins and glutenins constitute 80-85% of the total grain protein, and confer elasticity and extensibility properties that are essential for the rheological functionality of wheat doughs (Shewry et al., 1995; Feillet, 1988; Shewry and Halford, 2002).

Several studies have examined the relationship between HMW-GS variation and pasta quality. Good pasta is associated with the HMW-GS allelic combinations of 1Bx13+1By16, 1Bx7+1By8, or 1Bx6+1By8 (Motalebi et al., 2007). In contrast, poor pasta quality is observed in

cultivars carrying the 1Bx20 (Pogna et al., 1990; Gianibelli et al., 2001). Older Canadian durum wheat cultivarsincluding Stewart-63 and Arcola possess the 1Bx7+1By8 HMW-GS, similar to high quality bread wheat cultivars, but recent Canadian durum wheat cultivars like Strongfield (Clarke et al., 2005), Commander (Clarke et al., 2006), AC Navigator (Clarke et al., 2001), and CDC Verona (Pozniak et al., 2009) possess 1Bx6+1By8 (Rao, 2008).

In wheat, several marker types are available for MAS, including restriction fragment length polymorphism (RFLP), amplified fragment length polymorphism (AFLP), simple sequence repeats (SSRs) and diversity array technology (DArT®) markers. In wheat, SSR markers are numerous and are the most commonly used markers (Somers et al., 2004). In addition, several SSR consensus maps of the wheat genome have been constructed (Somers et al., 2004), allowing targeted saturation ofQTL once they are identified. However, with increasingsequence efforts in wheat, use of expressed sequence tags (EST) and single nucleotide polymorphism (SNP) markers are increasing in wheat (Gao*et al*., 2004; GanalandRöder, 2007) and durum (Pozniak*et al*., 2007; Singh *et al*., 2009).

Ramdas*et al*., (2014) studied the exploring performance of wheat production in India. With the implementation of All India Coordinated Wheat Improvement Project (AICWIP) during 1964-65, self-sufficiency status was achieved through the introduction of high yielding semi dwarf varieties so called green revolution technologies. Significant positivegrowth was noticed in area, production and productivity of wheat. The study indicates that yield growth surpassed the acreage growth and is attributed to the coordinated research and increase in area under irrigation. However, growth in acreage can be attributed to the rising MSP over years.

**Conclusion:**

In the present work, review of different types of wheat varieties, the study determined that farmers' preference towards a variety was not only determined by its yield but also by other traits of importance. The study has an implication in the farmer-oriented extension andresearch program for suggesting farmers the most suitable variety in the area. Focusing to the farmers' preferred traits during the development and distribution of the wheat varieties would increase the likelihood of adoption of the varieties. The performance of the varieties released after semi dwarf wheat were introduced in India and various genetic stocks developed for different component traits was found below par across all the three years of evaluation. The varieties from warm and humid central areas of India, did notperform to their potential when grown in northwestern plains which experience high temperatures during grain filling.

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