Review Article

Effect of Sowing Dates on Performance of Different Wheat Cultivars: A Review

Abstract

Wheat (*Triticum aestivum* L.) is among the most widely cultivated cereal crops globally.Wheat belongs to family Poaceaeand genus*Triticum* and its center of origin is South Western Asia. Following China, India is the second-largest wheat producer in the world.Among divergent species of wheat crop, *Triticum aestivum* is the most prime because of its higher calorific values as well as a good addition for nutritional requirement ofhuman body due to appearance of 9-10 % protein and 60-80 % carbohydrates. Choosing the appropriate sowing time and selecting suitable cultivars are crucial for achieving higher wheat yields. Early sowing with the optimal plant population promotes better growth and nutrient uptake, leading to increased crop production. Delayed sowing reduces the growth, yield, and quality of wheat grain, while early sowing leads to greater yields thanks to a longer grain development phase. Additionally, cultivar selection played a crucial role in determining wheat performance. Some cultivars exhibited greater adaptability to varying sowing dates, maintaining higher yields and better stress tolerance.Proper selection of cultivars is obtained to maximum yield due to variation among the weather conditions and genetic diversity. Optimumsowing dates give suitable temperature to obtain maximum productivity and cultivars selection alsoplayprimeroleinobtainingmaximum wheatproduction. Improper selection of cultivars produces lower grain yield.

Key words: Cultivars, Growth, Temperature, Productivity and Sowing time

Introduction

Wheat (*Triticum aestivum* L.) is the world's foremost grain crop, and staple food for millions of people worldwide. Due to its extensive adaptability, *Triticum aestivum* is cultivated across a broad range of environmental conditions. It thrives in temperate irrigated regions as well as in areas characterized by both low and high rainfall. Wheat is also known as 'King of cereals. Wheat (*Triticum aestivum* L.) is the second most important staple food crop globally, following rice.Its nutritional value is paramount, as it provides a significant portion of the caloric intake, protein, dietary fiber, B-group vitamins, and essential minerals in the human diet. Due to its wide range of adaptability and great nutritional value, it is grown all over the world. Wheat being a cool season crop requires low temperature during its vegetative phase and flowering. climate is the most important factor in

realizing their yield potential, which is further influenced by their response to different sowing dates. Wheat (*Triticum aestivum* L.) is a temperature-sensitive crop, with late sowing often resulting in reduced yield components and adverse effects on various aspects of its growth and development.As a C_3 type crop, it thrives well in cool environment. It has been observed that wheat sown at the optimal sowing date generally exhibits a longer growth duration, which provides the crop with increased opportunity for biomass accumulation. Achieving high wheat yields requires selecting the appropriate sowing time to ensure favorable growth conditions. There are significant opportunities to boost wheat production by developing new high-yield cultivars and optimizing sowing schedules (PrajapatandSaxena 2018).

The timing of sowing and the selection of cultivars play crucial roles in establishing a successful crop stand.The timing of sowing is a key agronomic factor for achieving high yields in small grain cereal crops,that impacts the timing and duration of vegetative and reproductive growth phases.Therefore, one of the requirements for obtaining high yield is the choice of the suitable sowing date due to variations in weather conditions among seasons and developing new high yielding cultivars and by adopting proper sowing date (Mumtazetal.,2015).

As a temperature-sensitive crop, late-sown wheat is subjected to low temperatures during establishment and high temperatures during the reproductive phase. This combination ultimately results in accelerated crop maturity.An optimal sowing date significantly enhances the grain yield and baking quality of wheat by improving the crop's physiological and phenological adaptation to environmental conditions. It also influences the availability of water, temperature, and solar radiation for the crop. Conversely, delaying sowing can negatively affect germination, growth, grain development, and tillering due to lower temperatures, ultimately resulting in reduced yields.

Among the various factors that contribute to low wheat crop yields, varietal selection ismost importance for high yield. Improper selection of cultivars also affects crop yield because performance of cultivars varies correspondingly with their genetic potential and adaptable environment, so there is scope for increasing yield of wheat with proper selection of cultivars (Ramet al., 2012). Introducing new wheat cultivars with high yield potential and broad adaptability is a key factor in boosting wheat production.Proper selection of cultivars effects the plant population, plant height, number of tillers, 1000 grain weight, grain yield and straw yield. Wheat yield can be increased 10 to 80% through proper selection of sowing time and suitable cultivars (Coventry et al., 2011).Effective management of sowing dates, cultivar selection, and environmental conditions has the potential to increase wheat grain yields by 10 to 80%.

Effect of sowing dates on growth of wheat

Tahir et al. (2009) conducted a field experiment during winter 2005-2006 to study the effect of different sowing datesongrowthandyieldofwheat(*TriticumaestivumL.*)atFaisalabad-Pakistan.Theyreportedthatwheatcropsownon1st Decemberrecordedmaximumgerminationcount(m^{-2}),no.offertiletillers(m^{-2})andplantheight(cm)rest than other sowing dates.

Mukherjee (2012) carried out field experiment at Uttar Banga Krishi Vishwavidyalaya, Kalimpongwith five different dates of sowing (1st November, 15th November, 30th November, 15th December and30th December) and six varieties and reported that different growth indices such as plant height, drymatterwassignificantlyinfluenced bydifferent dates of sowing.

Pal et al. (2012) conducted a field experiment crop characteristics of wheat genotypes with threesowing at Pant Nagar and revealed that timely sown wheat crop performed better photosynthesis dueto greater leaf area index and significantly produce higher dry matter production with more number oftillersperplant.

Mumtaz et al. (2015) conducted field experiment at agronomy research station, Bahawalpur, Pakistanwithsixgenotypes(V-Aari-11,V-Aas-11,V-Meraj-08,V-Millat-11,V-Punjab-11,V-Seher-06)andsix different sowing dates (D-1 November, D-11 November, D-21 November, D-1 December, D-11December, D-21 December). They reported that sowing date on 11 November performed higher withrespect to days taken to different growth stages such as booting, heading, anthesis and maturity,germinationcount(m^{-2}), numberoftillers(m^{-2}),plantheight(cm).

Gupta et al. (2017) studied the effect of different sowing dates (1st December, 20th December and 6thJanuary) on growth and yield attributes of wheat crop at G.B. Pant University Uttarakhand and foundthatthenumberofdaystakenbydifferentgrowthstagessuchasleafareaindex,drymatteraccumulation was significantlyinfluenced byamong datesofsowing.

Pathania et al. (2018) carried out research trial effect of five dates of sowing (20th October, 5thNovember, 20th November, 5th and 20th December) on growth, yield attributes and yield of four wheatvarietiesatnorthwesternHimalayasandfoundthat20th Novemberdateofsowingproducedmaximum plantheight,tillers m^{-2},drymatter accumulation.

Singh etal. (2019) studied the effect of sowing dates and mulch on wheat crop and weeds. They reported 25th November date of sowing recorded maximum plant height(cm) andtillers count(number m^{-2}) rest than to other sowing date 10th December.

Chauhanetal.(2020)conductedresearchtrialatNarendraDevaUniversityofAgriculture&Technology, Faizabad (U.P.) to study the effect of different dates of sowing on growth and yield ofwheat (*Triticum aestivum L.*) cultivars. They found that the different sowing dates (November 20, November30 and December 10) and cultivars significantly influenced the growth characters of wheatcropsuchashighestinitialplantpopulation(m^{-2}),plantheight(cm),numberoftillers(m^{-2}),drymatter

accumulation (g m^{-2}), leaf area index, days taken to 50% ear emergence and maturity ascomparedtoothersowingdates.

Kaur et al. (2020) conducted field experiment to study the effect of sowing dates (25th October, 25thNovember and 25th December) and varieties on growth and yield of wheat in Himachal Pradesh andreportedthatthe timely dateof sowingofwheatcroprecorded significantly highestplantheight,tillersm^{-2}, drymatteraccumulation, grains spike^{-1}, grainand straw yield.

Singh et al. (2021) studied the effects of sowing dates (26th November, 11th December and 25thDecember) on yield and yield components of different varieties of wheat at Agricultural ResearchFarm, Moradabad(UP) and found thatwheatsown on 26thNovemberrecordedmaximumplantheight, tillers plant^{-1}, spikes^{-1} plant, as compared to late sown wheat crop on 11th December and 25thDecember.

Mitasha et al. (2022) conducted experiment to evaluate the performance of new wheat varieties atdifferent dates (13th November and 3rd December) of sowing under irrigated conditions at AgricultureandResearchStation,Sarkandaandfoundthatthetimelydatesofsowingproducedmaximumpla nt population, growth parameters, including plant height, dry matter accumulation (g plant^{-1}) and numberoftillers as comparetotheother date of sowing.

Alametal.(2022)studiedtheeffectofsowingdates(5thNovember,25thNovember,15thDecember,5thJanuary)andvarietiesofwheatcropongrowthandproductivityatAcharyaNarendraDevaUniversity of Agriculture and Technology, Ayodhya (U.P) and found that growth parameter of wheatcrop were reduced (number of tillers m^{-2}, plant height at various stages (cm), leaf area index) whenwheatcropwas sownunderlate sownconditions.

During winter 2021 Habibietal.(2023)conducted a study atBaghlanuniversity, Afghanistan to study impact of during winter sowing dates on three different varieties. They found that February 22 sowing date resulted in higher plant height and germination count m^{-2} while lowest plant height and germination count m^{-2} was reported in 23 March sowing date.

Effectofsowingdateonyield andyield attributesofwheat

Baloch et al. (2010) conducted a field experiment at Agricultural Research Institute, Dera Ismail Khanon different sowing dates (October-25, November-10, November-25, December-10 and December-25)and different seed rates of 100, 125, 150, 175 and 200 kg ha^{-1}. They found that the wheat crop sownbetween October-25 to November-10 with seed rate of 150 kg ha^{-1} produced higher grain yield, spikelengthand 1000-grainweight.

Khosravi et al. (2010) studied the effect of different sowing dates on yield and yield components

ofwheat cultivars at Kerman University, Iran and found that maximum number of tillers per plant,numberofspikesperplant,numberofgrainspike^{-1}and1000-grainweightwasproducedwhenwheatcrop was sowninthemonth ofOctober.

Said etal. (2012) conducted a study at Agricultural Research Institute, Peshawar Pakistan with different planting dates & seedling rates and they found that 15th November sowing dates produced highest grain yield, biological yield, 1000 grain weight and harvest index (%).

Aslani and Mehrvar (2012) A field trial was conducted on farmer's fields to investigate the effect ondifferentsowingdatesandreportedthatoptimumsowingdate(1stNovember)producedhigherbiomass and grain yield, number of spike m^{-2} and 1000 – grain weight as compared to late date ofsowing.

In InceptisolsoilofBanarasHinduUniversityVaranasi,(UP)Jatetal.(2013)laidout a field experimentto study the effect of sowing date and fertilizer on growth and yield of wheat crop. They reported thatsignificantly higher plant height, tillers m^{-1}, ear length, grains ear m^{-1}, ear weight, grains ear^{-1}, test weight, grain and straw yield was recorded in 20thNovemberdateofsowing.

A two year's field study was conducted by Mumtaz et al. (2015) at Agronomic Research Station,Bahawalpur, Pakistan with six different planting dates and six genotypes. They reported that wheatcrop which was sown on 11th November produced higher number grains spike^{-1},1000- grain weightandgrainyieldof wheat whereaslatesownwheatresultedinreductionofall theseattributes.

At crop research station, Masodha NDUA&T Faizabad Verma et al.(2016) conducted a field study to assess the response of different wheat varieties in timely sown conditions. They observed that 15th November sowing date of wheat reported higher values of yield & yield components while lower values were reported 25th November.

A two-year field trial was laid out in sandy loam soil at Faizabad Kumar et al. (2016) to study theresponse of sowing time and nitrogen scheduling in wheat crop under late sown condition. TheyobservedthatwheatcropsownonD1dateofsowing(5thDecember)producedhighestgrain,strawandbiomass yield and1000-grain weight as compared toother datesofsowingstudied.

Pathania et al. (2018) studied the effect of fivedifferent dates of sowing on growth, yield attributesand yield of four wheat varieties at Palampur and found that the wheat crop sown on 20th Novemberdateofsowingrecordedhighestgrainspike^{-1},grainyieldandstrawyieldascomparedtootherdatesof sowing.

Effectofsowing dateson economicsofwheat

Mukherjee (2012) studied the effect of different sowing dates and cultivars on yield of wheat at UttarBanga Krishi Vishwavidyalaya, Kalimpong. They reported that maximum net returns (Rs.

24,926
andRs.23,192)andhigherB:Cratio(2.11and2.03)wasrecordedwith15th Novemberand30th November sowingdates.

Alam et al. (2013) studied the performance of wheat varieties under different sowing dates at BirsaAgricultural University, Ranchi and recorded that wheat crop sown on 25th November achieve highernetreturns of(Rs. 37400)withB:Cratioof(1.34)ascompareto20thDecembersowing date.

Tomar et al. (2014) studied the effects of various sowing dateson yield and yieldcomponents ofwheat at Agricultural research farm, Gwalior (MP) and recorded that the wheat varieties sown on 14thNovember resulted in maximum total income, net income and B: C ratio than the crop sown on 21stNovember.

Bachhao (2018) conducted the field experiment to study the effect of different sowing dates anddifferent wheat varieties at Mahatma Phule Krishi Vidyapeeth, Maharashtra and reported that themaximum gross returns (Rs. 73,194 ha^{-1}), net returns (Rs. 38,194 ha^{-1}) and B: C ratio (2.09) wasrecordedin wheatcrop sownon1stweek ofDecember.

Yusufetal.(2019)studiedtheeffectofsowingdatesandvarietiesonyieldandqualityperformanceofwheat at CCS Haryana Agricultural University, Hisar and observed that wheat crop sown on 5 thNovember recorded higher net returns (Rs.54, 262 ha^{-1}) and B: C ratio (1.73) as compared to othersowing dates.

Kumar et al. (2019) studied the effect of sowing dates on different wheat genotypes at RajendraAgricultural University, Pusa (Bihar) and found that wheat crop sown on 27th November recordedhighest netreturns andB:Cratiowhichwas followedby11th December.

On the basis of field trial conducted to identify the optimum date of wheat at Shaheed GundadhoorCollege of Agriculture, Chhattisgarh Netam et al. (2020) reported that wheat crop sown on 15thNovember recorded significantly higher gross returns (Rs. 61763 ha^{-1}), net return (Rs. 35498 ha^{-1}) andB: Cratio(2.35) as compare to other dates ofsowing.

Kumari et al. (2022) studied the effect of date of sowing on yield attributes, yield and profitability ofwheat at Chandra Shekhar Azad University of Agriculture and Technology, Kanpur (Uttar Pradesh)and they found that the crop sown on 15th November resulted in significantly higher gross income (Rs118837.667 ha^{-1}), net income (Rs.49087.66 ha^{-1}) as well as B:C ratio (1.7) of wheat as compared to30thNovember,10th Decemberdateof sowing.

Singh et al. (2022) studied the effect of sowing dates (15th November and 15th December) on growthand yield attributes of wheat variety (K 1317) at Acharya Narendra Dev University of Agriculture andTechnology, Ayodhya and they found that crop sown on 15th November resulted in significantly higherbenefitcostratiofromearlysowing3.45as comparedto15th Decemberdate ofsowing.

Effectofvarietiesongrowthof wheat

At the University of Agriculture, Faisalabad, Pakistan, Tahir et al. (2009) examined the effect ofdifferent sowing dates on growth and yield of three wheat varieties (Inqlab-91, AS-2002 and Bhakkar-2002). The result showed that the lower number of fertile tillers was produced by AS-2002whereasInqlab-91 produced thetallestplantsincomparisonto the othervarieties.

InafieldexperimentconductedintheBahawalpurzonebyAkhtaretal.(2012),tostudiedtheeffectof late planting on emergence and tillering of different varieties of wheat. The result showed thatBhakkar-2002 recorded the maximum germination percentage and number of tillers over as Inqlab-91,Punjab-96 andMH-97.

Mumtaz et al. (2015) studied the performance of different wheat genotypes and reported that highergermination count m^{-2}, numbers of tillers m^{-2} and plant height was recorded in genotypes Millat-11,Meraj-08and Sehar-06.

Uddin et al. (2015) carried out a field experiment at Sher-e-Bangla Agricultural University, Dhaka, toinvestigate the impact of sowing date on the growth and yield of four wheat varieties (BARI Gom-21,BARI Gom-24, BARI Gom-25, and BARI Gom-26). They found that BARI Gom-21 taken higher numberof days toreachedanthesis and producedthemaximumplantheight.

A field study was conducted at Bangladesh Agricultural University, Mymensingh by Madhu et al.(2018) to studied the effect of sowing date on the growth and yield performance of wheat varieties(BARI Gom 25, BARI Gom 26, BARI Gom 27 and Shatabdi). They revealed that BARI Gom 25producedthe maximumplantpopulation$m^{-2}$and plant heightthanotherwheat varieties.

Parveenetal.(2018)testedtheperformancedifferentcultivarsofwheatatSamHigginbottomUniversity of Agriculture, Technology and Sciences, Allahabad and reported significantly higher plantheight, number of tillers and number of spikelets $spike^{-1}$ in variety HD 2967 as compared to PBW 502and PBW154.

In sandy loam soil of Agricultural Research Institute, Rajendranagar, Telangana Goverdhan et al.(2019) laid out field trial to evaluation of wheat genotypes (Raj 4037, HP 4080 and PDW 315) underdifferent dates of sowing and result showed thatPDW 315 recorded maximum plant height, numberoftillersm^{-2}.

Netam et al. (2020) performed a field experiment at Shaheed Gundadhoor College of Agriculture,Chhattisgarh and reported that wheat variety Sujata showed substantially higher plant height, numberoftillers,panicleemergence as compared toothervarieties.

Singh et al. (2021) tested the performance of five wheat varieties (HD 2733, HD 2824, PB343,

PBW443 and UP 262) at Krishi Vigyan Kendra, Jamui (Bihar) and reported higher plant height and numberoftillersin HD2733as comparedto other variety HD2824.

Sah et al. (2022) conducted a field trial to examine the Impact of Sowing Dates on Wheat Varieties(BL 4407, BL 4621, BL 4699, and Vijay) and result showed that BL 4699 recorded maximum plantheight and spikelengthratherthan other varieties.

Experiment carried out by Karada et al. (2023) at the Forestry Research Farm in Jabalpur (MP) todetermine the performance of wheat varieties and the result showed that MP-3336 variety exhibitedhigherplant population, whiletheGW-322 varietyshowed taller plantsatharvest.

A field experiment was conducted at University Farm of Dr. Rajendra Prasad Central AgriculturalUniversity Bihar by Sattar et al. (2023) to assess the responses of phenology and yield attributes withthree prominent cultivars of the region (RAU-3711, HD-2824, and HD-2733) and found that wheatcultivar RAU-3711 attain lesser days to different growth stages such as booting, 50% flowering,milking,dough, and maturitystages ascomparedto HD-2824and HD-2733.

Singla and Sarlach (2023) studied the performance of different wheat cultivars at RIMT University,Punjab. They reported thatwheat variety PBW 725had significantly higher plantheight and drymatteraccumulationat allgrowthstagescompared toothervariety.

Effectofvarietiesonyieldandyieldattributesofwheat

A field trial was conducted by Ali and Ali (2010) to study the effect of Two newly evolved wheatvarieties SH-2002 and AS-2002andacheck(Uqab-2000)on yield at AdaptiveResearchFarm,Vehari, Pakistan. The results revealed that wheat variety AS-2002 produced maximum grain yield andprovedbetter than SH-2002andUqab-2000.

Al-Musa et al. (2012) studied the performance of different wheat varieties (BARI ghom-23, BARIghom-24, BARI ghom-25 and BARI ghom-26) at Patuakhali Science and Technology University,Patuakhaliand reported thatvariety BARI ghom-26 resulted in maximum yield andyield attributes(grains per spike, 1000-grain weight, higher grain and straw yield and greater harvest index) of wheatascomparedto other varietiesin HD-2733as comparedto othervarieties.

Chourasiya et al. (2013) assisted a field trial at Gird region of Madhya Pradeshto find out theresponse of different wheat varieties and the result revealed that among varieties, HI 8498 producedsignificantly maximum grain and straw yield. They also showed that HI 8498 recorded maximumnumber of tillers m^{-2}, ear head m^{-2}, number of grains $spike^{-1}$ and test weight as compared to rest of thevarieties.

A field experiment was conducted at Institute of Agriculture and Animal Science (IAAS), Rampur byMarasini et al. (2016) to find out the response of wheat varieties (Tillotama, Danfe and Vijay)

underdifferent sowing dates and reported that Danfe produced maximum number of effective tiller m^{-2} andstrawyieldwhereasNumberofgrainsspike^{-1}Tillotamawas highest.

HabibiandFazily(2020)comparedtheperformanceoffourwheatvarieties(Solh02,Gul09,Muqawim09, Kabul 013) and reported that wheat varieties Kabul 013 and Gul 09 was better in termof higher number of effective tillers plant $^{-1}$, test weight and grain yield of wheat over rest of thevarieties.

On the basis of field investigation carried out to study the effect of sowing date on the performance ofwheatvarietiesMadhuet.al.(2018)reportedthatBARIGom-25producedhighernumberof effective tillers, number of total spikelet's spike^{-1}, spike length, no. of grains spike^{-1}, grain yield andstrawyieldas compared toothervarieties.

In a field experiment conducted at National Wheat Research Program, Bhairahawa, Nepal to study theeffect of sowing dates on yield of different wheat varieties (Vijay, NL971 and BL4316) Yadav et. al.(2018)foundthatNL971producedsignificantlyhighergrainyield,1000-grainsweight,totalbiomass and harvestindexas comparedtoVijay and BL4316.

Yusuf et al. (2019) compared the performance of different varieties at CCS Haryana AgriculturalUniversity,Hisarandreportedthatsignificantlyhighernumberofeffectivetillers,grainsperspik eandspikelengthwas recordedin variety HI1544 ascomparedto othervarietiestested.

Kumar et al. (2019) conducted a field experiment at Rajendra Agricultural University, Pusa (Bihar) tostudy the performance of four wheat varieties (K 9107, PBW 343, HP 1744 and NW 1014) andreported that significantly higher grain yield was recorded in varieties K 9107 and PBW 343 ascomparedtoothervarietiesevaluated (HP1744andNW1014).

Kaur et al. (2020) studied the performance of four wheat varieties at Palampur H.P. and reported thatvarieties HPW- 349 and VL- 907 recorded significantly higher grains spike^{-1}, test weight, grain yieldandstrawyield.

Singhetal.(2021)comparedtheperformanceofdifferentwheatvarietiesatIFTMUniversity,Moradabad (UP) and reported that wheat variety HD 3086 resulted in higher grain yield and testweight. They also reported that higher straw yield, biological yield and harvest index was recorded invarietyHD2967 as compared to other varieties.

Kumari et al. (2022)conducted field trial to assess the performance of three wheat varieties atChandraShekhar AzadUniversityof AgricultureandTechnology,Kanpur(UttarPradesh)andreported that variety HD-2967 recorded highest values of yield and yield attributes of wheat (spikelength,number ofgrainsspike^{-1},1000-grainweightandgrainyield)ascomparedtoothervarieties.

Kumar et al. (2022) compared the performance of wheat varieties and reported that higher yield andyieldattributes wasrecorded in varietyVL-907.

Singla and Sarlach (2023) conducted field trial to assess the cultivars at RIMT University, Punjab andreported that wheat cultivar PBW 725 resulted in higher yield contributing characters and yield ascomparedtocultivarHP2967.

Effectofvarietiesoneconomicsofwheat

Mali and Choudhary (2012) studied the performance of bread wheat varieties (GW 322, GW 366 andHI 1544) and reported that higher net returns (Rs. 52,813) and B: C ratio (2.84) was recorded in wheatvarietyGW366.

Chourasiya et al. (2013) studied the response of different wheat varieties at Madhya Pradesh and theyreported wheat variety HI 8498 recorded highest gross returns (Rs.112324), net returns (Rs. 95410)and B:Cratio(5.64).

Nagarjuna et al. (2014) conducted a field experiment with four wheat cultivars at Dr PanjabraoDeshmukh Krishi Vidyapeeth, Akola (MS) and found that maximum net returns and B:C ratio wasreported in wheat cultivar MACS 2971 while the wheat cultivar DDK 1009 resulted in lower netreturnsand B:Cratio.

According to Verma et al. (2016) the wheat DBW 39 recorded highest net returns (Rs. 22556.00) andB:C ratio (1.86) which was followed by (HD 2967, HD 2733 and PBW 502) wheat variety. Theyfurther reported that wheat variety PBW 502 resulted in lower net returns (16998.0) and B:C ratio(1.65).

Netam et al. (2020) conducted a field experiment with four cultivars at Chhattisgarh and found thatmaximum net returns and B:C ratio was reported in wheat cultivar GW 273 while the wheat cultivarKanchanresultedin lowernetreturns and B:Cratio.

At Acharya Narendra Deva University of Agriculture & Technology, Faizabad (U.P.) Chauhan et al.(2020) conducted a field experiment to study the effect of different varieties (Malviya-234, PBW-343and NW-1012) on growth, productivity and economics of wheat. The result revealed that PBW-343recorded higher gross return (Rs. 95580 Rs. ha^{-1}) net return (Rs. 54547 ha^{-1}) and benefit cost ratio(1.33)rather than other wheatvarieties.

Singh et al. (2021) studied the effect of dates of sowing and different varieties (HD 2967, NW 1012,NW 5054 and DBW 187) on growth and yield of wheat at Agronomy Research Farm, Ayodhya andfound that maximum net returns (102581 Rs. ha^{-1}) and B:C ratio (2.46) was reported in wheat varietyDBW187 while theother varietiesresultedinlowernetreturns and B:Cratio.

Singh et al. (2021) investigated five different wheat cultivars at Krishi Vigyan Kendra, Jamui (Bihar)andreportedsignificantlyhighernet returns(Rs52,435)andB:Cratio(2.02)fromcultivarHD2733.

Kumari et al. (2022) compared the performance of three wheat cultivars at Chandra Shekhar AzadUniversity of Agriculture and Technology, Kanpur (Uttar Pradesh) and reported that significantlyhighergrossreturns(Rs.115612.66),netreturns(Rs.45862.66)andB:Cratio(1.65)whilesignif icantlylowestnet returnsand grossreturns was observedin varietyVK1006.

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