

# Wheat Production Technology for Azad Kashmir and NWFP

Wheat is one of the major crops grown in Pakistan; it is not only used as staple food but also core part of animals feed as straw. Wheat takes more than 20 million acres of agricultural land in Pakistan producing approximately 19 million tonnes annually. The current average production is approximately 950 kilograms (25 mounds) per acre. Farmers can obtain optimum yields by following the given regional and climatic recommendations. They are

## Time of Sowing

To achieve maximum yields seed sowing should be completed before 20<sup>th</sup> November. Late sowing can result in 12-16 kgs yield reduction on daily basis. Seed sown in the beginning of January can only produce 50% of the normal yield. Therefore timely seed sowing is of vital importance for maximum grain production.

## Seed Selection

The seed used for sowing should have good germination capacity and should be healthy and free from seed borne diseases and seeds of weeds. Certified and improved seed is of crucial importance for higher wheat production. Pakistan Agricultural Research Council has developed several wheat varieties for different regions based on the climatic conditions, altitude, diseases and drought resistance. Therefore wheat varieties approved by the department of agriculture and seed certification board should be used for different agro-ecological zones. Based on agroecological zones, Pakistan has been divided into 12 different regions with their respective seed varieties and time of sowing. However this paper is only focused on the earthquake affected regions (Mansehra, Muzaffarabad).

## Chemical seed treatment

For controlling different wheat fungal diseases the use of fungicides TOPSON-M @ 2 g or DEROSIL @ 2ml or RAXIL 2DS @ 1.5 g per kg of wheat seed is recommended. For effective fungicide seed treatment a led container or plastic bag should be used.

## Land Preparation

Wheat sowing in Pakistan is mostly carried out after either cotton and sugar cane crop or on fallow soils. Similarly wheat crop is also widely cultivated in rainfed areas. Therefore land preparation has been divided into rainfed and irrigated areas

## Rainfed Regions

To ensure and avail better use of initial monsoon rain water and conserve moisture, deep ploughing should be carried out with a subsoiler. Normal cultivators can also be used after rainfall for weed control and soil moisture maintenance. Soil surface leveling should be carried out with normal cultivator and the use of seed drill for uniform sowing is highly recommended.

## Irrigated Regions

### Fallow lands

Lands left fallow for wheat sowing should be regularly ploughed to eliminate weed infestations. Level the soil surface and divide field area into small portions for efficient irrigation. Use normal cultivator with harrow at field capacity level. This would encourage weeds growth within a short time which can be eliminated with final cultivation and use of harrow for seedbed preparation.

Recommended Wheat seed varieties Earthquake affected areas

Region	Recommended varieties	Sowing date	Seed rate/acre
Higher regions of NWFP (Mansehra, Abbottabad, Swat, Chitral, Northern areas, Kuram Agency) above 4000 ft	Aquab 2002	15 Oct - 15 Nov	45 kg
	Haider 2002	1 Nov - 30 Nov	
	Bakhtwar 92	1 Nov - 15 Dec	
	Saleem 2000	15 Oct - 15 Nov	
Azad Jammu and Kashmir, Plains (Bagh, Muzaffarabad and Kotli) below 4000 ft	GA 2000	15 Oct - 15 Nov	50 kg
	Aquab 2002	20 Oct - 15 Nov	45 kg
	GA 2000		
	Margalla 99		
	Bakhtwar 92	1 Nov - 30 Nov	
Iqbal 2000	15 Nov - 15 Dec	50 kg	
Azad Jammu and Kashmir, higher regions (Rawala Kot, Kahota, Dir Kot, Chakar, Lipa, Atthmuqam) above 4000 ft	Aquab 2002	20 Oct - 15 Nov	45 kg
	Margalla 99		
	GA 2000		
	Bakhtwar 92	1 Nov - 30 Nov	
Iqbal 2000	15 Nov - 15 Dec	45 kg	

### Paddy soils

Stop watering paddy crop two weeks before harvesting. Use rotavator after rice harvesting at field capacity level followed by normal cultivator for final wheat seed drilling/broadcasting.

### Cotton, maize and sugar cane soils

Preceding crop should be irrigated three weeks before harvesting and the use of cultivator and rotavator is recommended for crop residue mixing. Wheat seed sowing should be immediately carried out at optimum moisture level once land preparation has been completed.

If the earlier crop is not irrigated before harvesting the soil should be ploughed twice for better water infiltration and aeration accompanied by the use of rotavator for final wheat seed drilling.

Saline soils should be ploughed after crop harvesting and levelled for light irrigation. Seed soaked for 8-12 hours should be sown in saline soils.

### Sowing

Wheat seeds are usually sown by broadcasting or drilling in Mansehra and Azad Jammu and Kashmir. Sowing with drills either tractor or bullock driven, ensures that the seed is deposited at a uniform depth. In a number of places, seed is also sown by hand, behind the plough drawn by the bullock. For timely sown and irrigated wheat, a row spacing of 15 to 22.5 cm is followed. 22.5 cm is considered to be the maximum spacing. For late but irrigated wheat, row spacing of 15-18 cm is considered to be the maximum. For dwarf varieties, planting depth should be between 5 to 6 cm. In case of conventional tall varieties, the sowing depth may be 8 or 9 cm. Usually deeper sowing is done in dry, rough and light soils, whereas shallow sowing is done in moist soils.

### Use of chemical fertilizers

Timely application and proportion of required chemical fertilizers is of vital importance for realizing the potential of wheat varieties. The use of fertilizers is dependent upon soil fertility, water availability and crop rotation or cropping intensity. Nitrogen and phosphorous fertilizers should be used from 1:1 to 1.5:1 ratio respectively. In irrigated soils full amount of Phosphorous fertilizers should be applied at the time of sowing however half of the nitrogen fertilizer should be applied at sowing and the rest with first irrigation. If phosphorous fertilizer is not applied at the time of sowing, this can be compensated with the first irrigation. Similarly in rainfed areas total dose of fertilizers is used at the time of sowing otherwise with the first precipitation.

The use of potassium is also recommended on sandy, tube well irrigated and following exhaustive crops (rice and sugar cane) soils for wheat cultivation in certain areas of Pakistan. Likewise in high pH (8.2) soils, lime is applied for better fertilizer utilization by the crop.

### Fertilizer recommendations for AJK and NWFP (earth quake affected areas)

Region	Sowing (bags/acre)			First irrigation/rainfall (bags/acre)		
	Urea	DAP	Potassium Sulphate	Urea	DAP	Potassium
<b>NWFP</b>						
Higher regions with irrigation	1 or 2 AS*	1 1 DAP & 1 PS**	1	1	-	-
Rainfed areas (higher rainfall >1200)	2 or 1 DAP & 2 AS	1	0.5	-	-	-
Rainfed areas (low rainfall) <800mm	1 or 1 SSP & 2 AS	1	0			
<b>AJK</b>						
Medium rainfall areas (1200mm)	1 or 2.5 Nitrophos & 0.5 AS	1.25	-	-	-	-
Lower rainfall areas (<800mm)	1 or 2 Nitrophos & 1 AS	1	-	-	-	-

\*Ammonium Sulphate, \*\*Potassium Sulphate, single super phosphate,

### Irrigation

Wheat plant needs water at two critical stages, first at tillering that starts a week after emergence so irrigation should be applied not later than 20-25 days after seeding. The second irrigation is necessary between anthesis and grain formation if irrigation water is available. The irrigation requirement depends on rainfall distribution between different growth stages. Generally 4 to 6 irrigations are required during the whole crop cycle.

### Weed Control

Weeds can cause 12- 35% reduction in wheat yields if no control measures are applied. The most common types of weeds in Pakistan are grass weeds (wild oat, lawn grass etc) and broad leaf weeds (rumix, wild onion, etc). Weeds can be controlled through cultural and chemical methods. Bar harrowing is one of the important practices under cultural weed control, which may be done by Bar harrow that run after first or second irrigation when soil comes into condition using bullocks to drag this implement. Bar harrow would perform the function of inter-culturing along with uprooting weeds.

Weedicides can also be used for eliminating weed populations. Several broad and narrow leaf weedicides are available for different species. Agriculture department recommended weedicides should be used for effective elimination of weeds and the safety instruction should be carefully followed.

### Insect pests and diseases

Wheat crop is seriously damaged by grasshoppers and white ants during the seedling stage especially in rainfed areas. Aphids and army worms attack the crop in spring after heading. These insects can be controlled with spray or suitable insecticide bait.

Wheat crop is attacked by Rusts, smuts, powdery mildew and septoria diseases causing considerable losses to the final yield. These diseases can be controlled through resistant varieties. A number of resistant varieties have been developed to overcome these in different regions.

### Harvesting, Threshing and Storage

The wheat crop is harvested when the grains harden and the straw becomes dry and brittle. Clean parts of field where crop is not lodged should be selected to keep as seed. Harvesting and threshing of that field should be done separately to avoid any mixture. Similarly harvesting should be done 2-3 days earlier in case of semi dwarf improved varieties. Some wheat varieties shatter their seed if harvesting is delayed therefore this should be completed when grain moisture is around 16-17 percent. However grain moisture level should be around 9-10 percent before storage. Wheat seed should be stored in clean, thoroughly dried and fumigated bags and bins and or clean, fumigated stores. The stores and bins should be inspected periodically, and if there is any attack by rats and grain store pests, they should be eradicated with suitable bait or by fumigation.