



Best Practices in Wheat Production

Zone-Specific
 Recommendations for:



EASTERN REGION

Irrigated



Research-Based Recommendations made possible through by collaborative research undertaken by these partners:



Global Center for
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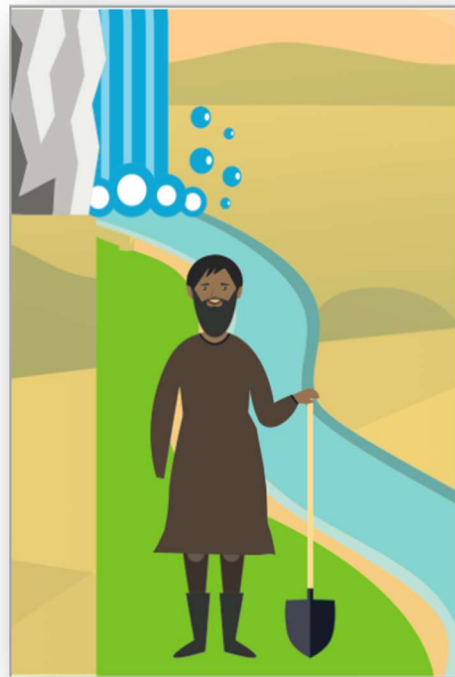
Introduction

Wheat is strategically an important crop in Afghanistan because it is linked directly to food security and is a major source of nutrition and up to 60% of a family's caloric intake. Although wheat occupies 2.66 million hectares of land, the country does not currently produce enough wheat to meet the growing population's needs. On average, annual production is estimated at 5 million metric tons, and the requirement is at 7 million metric tons. Afghanistan imports approximately 2 million metric tons of wheat flour from neighboring countries to fill this annual production gap. Wheat productivity is the lowest among the neighboring countries (2.0 metric tons per hectare vs. around 3 metric tons per hectare). There is tremendous potential to increase productivity of irrigated and rain-fed wheat in the Eastern region by introducing improved agronomic practices and utilizing suitable technologies.

This booklet provides research-based information on best management practices regarding the key aspects that contribute to increased productivity of wheat. This includes recommendations for proper sowing dates, nutrient management, weed management, and best stages and methods of irrigation.

This booklet is intended for use by agricultural extension staff in the Eastern Zone. Recognizing the agro-ecological diversity of Afghanistan, this booklet is part of a series of four booklets, each covering a different agro-ecological zone. Ultimately, this guide aims to arm extension staff and farmers with the information necessary to increase wheat production and contribute to food security.

Best Practices for Production of Wheat Under Irrigated Conditions



Date of Sowing

The sowing time of various field crops is governed not only by their growing cycle and environmental requirements but also by the necessity of avoiding the ravages of diseases and insect pests. Sowing at the proper time helps the wheat crop to express its growth pattern to the full extent in a particular environment (area), and therefore to maximize its yield. Significant research has been undertaken to determine the proper sowing dates of winter and spring wheat for the Eastern region of the country. Research results show that the best time to sow irrigated **winter wheat** in the **Eastern Zone** is from **November 15 to 30** and the best time for irrigated **spring wheat** is from **(November 20 to December 10)**.

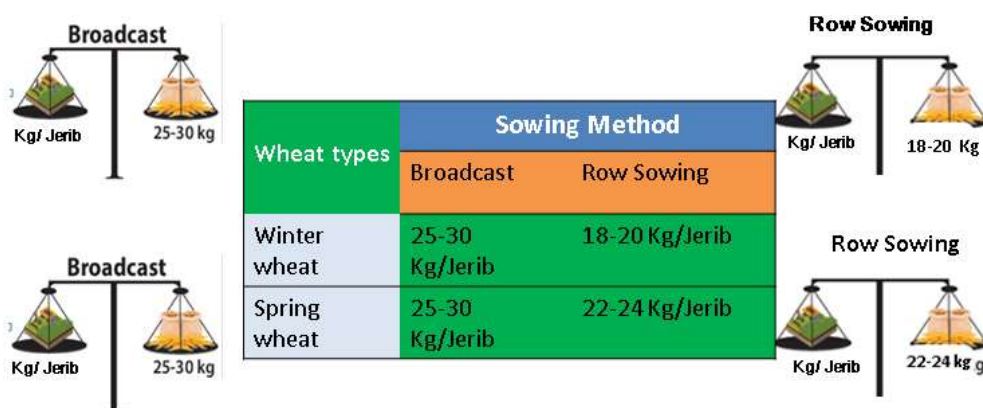
Wheat Type		Sowing Dates
عقرب ۱۰	قوس ۲۵	Winter Nov 15 to 30
قوس ۲۰	عقرب ۳۰	Spring Nov 20 to Dec 10



Seed Rate (Kg/jb)

Proper population density and spacing greatly influences crop yield and quality, so it is very important for achieving the full potential of high-quality seeds and technologies. A below-optimum seeding rate may reduce resource

use efficiency, yields, and final profit. Meanwhile, above-optimum seeding rates will increase the cost of production and may decrease yield by increasing disease and insect pressure, and by increasing the competition between plants for the uptake of minerals, water, and light, ultimately causing crop lodging, fewer kernels per head, or low kernel weight. Research has shown that the optimum seeding rate for irrigated wheat sown by the **broadcast method** in the Eastern Zone is **25-30 kilograms per jerib (Kg/jb)** for both winter and spring wheat varieties. In **row cultivation** methods, the suggested optimum seed rate is **18-20 Kg/jb** for winter varieties and **22-24 Kg/jb** for spring varieties.



Farmers should use only high-quality seed that has a high germination rate (85-90%) and is free from weed seeds and disease, and should purchase seed from reliable sources ideally choose certified, and proven well-adapted varieties to the Eastern climatic region of the country.

Fertilizer Timing and Rate

Smart use of fertilizers, especially those containing Nitrogen (N) and Phosphorus (P), can lead to significant wheat production increases.



Research has shown that for irrigated wheat in the **Eastern Zone** of Afghanistan, fertilization gives best results at three growth stages: sowing, tillering, and before flowering. **DAP**, Diammonium phosphate (18-46-0),

should be applied at the **rate of 40 Kg/jb prior to sowing** or **at sowing**. DAP serves as a pre-plant starter source of nitrogen and phosphorus. Urea (46-0-0) should be applied at **18 Kg/jb** along with DAP during sowing.

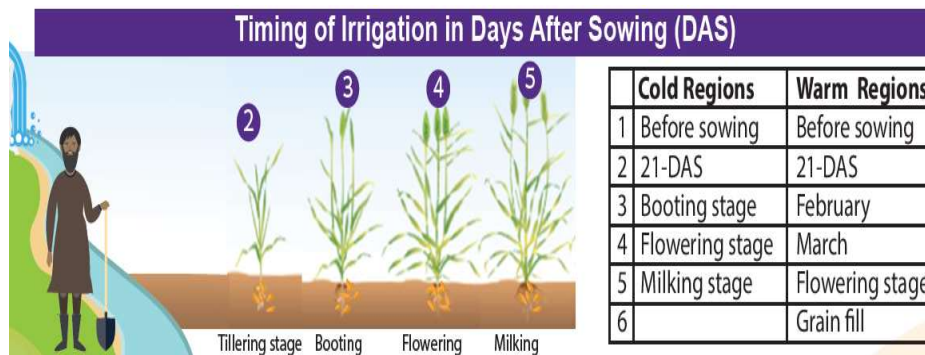
The second application of fertilizer is to provide a nitrogen source. **Urea** (46-0-0) at **20 Kg/jb** should be applied during the **tillering stage**. A third application of fertilizer (nitrogen in the form of urea at **14 Kg/jb**) should be applied **prior to the flowering stage**. Nitrogen applied after jointing will have less effect on yield.

Fertilizer Type	Fertilizer Application Rate (Kg/Jerib) by Growth Stage		
	1 st Application: At sowing	2 nd Application: Tillering	3 rd Application: Before Flowering
DAP	40	-----	-----
Urea	18	20	14

Observation crop growth and applying fertilizer at these three growth stages is essential.

Timing of Irrigation

Water is a vital input for crop growth and efficient utilization of plant nutrients. Appropriate water supply at critical stages of crop growth contributes to improved yield and possibly even grain quality. Excess water may cause lodging in wheat and create more favorable conditions for pest and diseases, significantly impacting the yield.



Agronomic research has shown that for the **Eastern Zone in Irrigated production**, water availability is most critical at five identified stages. Irrigating before sowing is important to ensure proper germination. The second irrigation should be given 21 days after sowing if field observations indicate low soil moisture due to lack of rainfall. The third, fourth, and fifth stages for irrigation are Booting, Flowering (also known as Anthesis), and milking (also known as dough). In warmer locations within the Eastern Zone, the six most critical stages of growth at which irrigation should be timed are: before sowing, 21 days after sowing, February, March, flowering, and the period of grain filling. These critical stages need special attention for the proper growth, optimum tiller development, and yield.

Weed Management

Wheat fields are commonly infested with both grasses and broad-leaved weeds. To realize the full yield potential of the wheat crop, proper weed control is essential. Among various methods of weed controls, chemical



control can be effective. Both **pre-plant and post-emergence chemical herbicides** are effective for weed control in wheat when applied at

appropriate times and targeted to the most threatening weeds. For specific information regarding chemical recommendations please consult the DAIL provincial extension office or contact the MAIL Plant Protection Office located in the Kabul, Badam Bagh office.

Non-chemical methods can also be effective when done in a timely manner. For example, farmers should plow under germinated weeds 30-40 days prior to sowing wheat. Additionally, farmers can control newly germinated weeds by hand pulling or mechanical methods when weeds are small, ideally when weeds are at the two- to four-leaf stage. Do not allow weeds to mature and produce seed. Sow dense cover fodder crops following wheat harvest to prevent weed encroachment in late summer and fall. **Remember: NO WEED SEEDS MEANS NO WEEDS.**



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Thank you for your service in providing research-based information to the farmers of Afghanistan to increase wheat production and quality. Please contact your nearest research station managed by the Agricultural Research Institute of Afghanistan (ARIA) with any questions or other feedback.



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