



## **International Congress on Economics, Management and Business Studies**

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### **EFFECT OF SOWING DATES ON SOYBEAN YIELD**

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#### **Relevance**

Sowing date is one of the cheapest and most powerful agronomic factors affecting soybean (*Glycine max* (L.) Merr.) yield, because it determines the temperature, day length and solar radiation that the crop receives at each growth stage. In Uzbekistan, soybean is largely grown as a second (repeated) crop after winter wheat, which was expanded in the Ferghana Valley after independence and allows farmers to grow a second crop on the same land within one season [1,2]. Sowing time is therefore tightly constrained by the wheat harvest, and a delay of even a few weeks may reduce the length of the growing period available to the crop.

**Keywords:** Soybean, sowing date, yield, photoperiod, phenology, second crop, Uzbekistan

#### **Aim**

The aim of this work was to summarize published evidence on how sowing date affects the development and yield of soybean and to interpret it for irrigated conditions in Uzbekistan.

#### **Evidence**

In a two-season study in contrasting agro-ecological zones of Pakistan, soybean cultivars NARC-2 and NARC-21 were sown on 5 June, 25 June and 15 July at a rainfed semi-arid site and an irrigated temperate site. Early sowing gave the



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highest yield at both sites, the lowest yield was recorded for NARC-2 sown on 15 July, NARC-21 outyielded NARC-2 by about 38%, and yield was positively associated with the total solar radiation received during the crop cycle [3]. Under Cerrado conditions in Brazil, delaying sowing shortened the growth cycle and reduced plant height, the number of nodes on the main stem and pods per plant; longer-cycle cultivars were better suited to delayed sowing and gave higher grain yields than shorter-cycle ones [4].

### **Physiology**

Day length is the main mechanism behind these responses. In indeterminate soybean, extending the photoperiod slowed development and lengthened the R3-R6 period, added mainstem nodes and increased the number of pods on upper nodes. Seed number followed the biomass ( $r^2 = 0.77$ ) and radiation ( $r^2 = 0.84$ ) accumulated during R3-R6, so the radiation and growth available during pod set and early seed filling set the yield potential [5]. The benefit of a longer photoperiod was most consistent at normal sowing dates and less so at late ones [5].

### **Uzbekistan**

For irrigated soybean in Uzbekistan, a recent conference paper on repeated-crop soybean on light gray soils of Jizzakh province addressed sowing timing together with germination, growth, irrigation norms and care agrotechnology [6], and multi-year trials in Samarkand and Navoi showed that pods per plant, seeds per plant, 1000-seed weight and yield differed significantly among local and foreign varieties [7]. The abstracts available to us do not give sowing-date yield figures for Uzbekistan, so a quantitative sowing-date response curve for the region remains to be established.



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### Conclusion

The available evidence indicates that earlier sowing generally gives higher soybean yield, mainly through a longer growing period and greater radiation capture during pod and seed formation, and that cultivar maturity group modifies this response. For second-crop soybean in Uzbekistan, it is therefore reasonable to sow immediately after wheat harvest and to match the maturity group to the remaining season; this is an inference from foreign trials and should be tested in local multi-date experiments.

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