

## Optimum Irrigation for Black-Eyed Pea in the Texas High Plains

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Black-eyed peas (cowpeas) are grown in several Texas High Plains counties. I'll use a farmer's question about mid-season inputs and foliar feeding for black-eyes and whether it might justify the expense as an opportunity to highlight the importance of optimum irrigation and avoiding crop moisture stress. The following discussion involves the cost and hoped-for return of extra inputs that are *unproven* vs. what the crop probably really needs most in typical summer heat.

A South Plains grower recognized he had a very nice black-eye crop, and he is interested in applying a foliar feed of some sort to preserve his blooms so they don't abort and thus thwart potential pod fill. There isn't much foliar feed information on black-eyed peas, only perhaps a little experience. One basic industry production guide for black-eyed peas suggests that growers in the region could consider foliar feeding iron, zinc, manganese, and boron "on some soils."

Let's ask ourselves a couple of key questions to help us sort out how important something like a foliar feed (or other mid-season input) and its cost might be, relative to other possible mid-season inputs:

What is the greatest stress on black-eyes in a typical Texas South Plains summer? **Heat!**

What reduces this stress, and the many ways in which it affects the plant (pollination, pod set, fruit retention, pod fill)? **Water!** No foliar chemical, growth hormone, etc. can do the job as well.

My feeling—and a strong one—is this: as hot as it is, if a grower is willing to spend an extra \$5 to \$10/acre plus application costs for a foliar feed or some other input (for a possible benefit that is unknown and certainly unproven), the grower would be much better served to accelerate their irrigation schedule by a few days if water is available. Thus on his irrigation cycle through the growing season that additional \$5 or \$10 per acre will pay for an extra 2/3 to 1.25" water per acre as additional irrigation.

### **Black-eyed pea development and yield potential**

The growth and development of black-eyed pea in West Texas is similar to but shorter in season than soybean. According to Dr. Rollie Roberts, former Extension vegetable specialist at Lubbock, maturity occurs in relation to summer heat, but most varieties will initiate bloom by 45 to 50 days after germination, and reach harvest maturity around 90 days. Physiological maturity is roughly 70 to 80 days or so. Black-eyed peas are most sensitive to heat and moisture stress from just before initial flowering through bloom completion. Favorable conditions will influence a higher proportion of buds to develop and flower, hence a higher yield potential. Moisture stress during flowering will curtail pollination and fertilization.

## **Optimum irrigation timing for black-eyed pea**

Preplant soil moisture is very important. If black-eyes are planted in very good soil moisture conditions, irrigation at early flower will in most cases allow a yield potential of 1,400-1,800 lbs./acre. If rains come at the right time in this scenario, then well above 2,000 lbs./acre is possible.

Black-eyed peas can utilize up to 15" of irrigation water depending on soil moisture at planting and in-season rainfall. As a rule of thumb growers can expect a yield response of about 100 to 150 lbs. per acre-inch of water.

If water is available, black-eyed peas should receive at least 1 inch of water per week, from pre-bloom through pod fill. Again, the most critical time is from just before initial flowering through bloom completion. Drought stress or a single missed irrigation during this time can hammer yields severely. Be careful, however, to ensure that soils are not water logged from over irrigation lest yields be hurt.

If a grower could irrigate black-eyed peas once, the optimal response is most likely at initial flowering. This is provided you can get the plant to this point, which may be difficult in a year like 2001, 2012, or 2013. From this point forward black-eyed peas respond best to frequent irrigation to maintain good soil moisture, but for additional irrigations when limited water is available, irrigating at 7 to 10 day intervals, through early pod fill is best. Irrigations late in the development of the seed after the seed has reached full width in the pod will contribute little if any yield potential, particularly if adequate soil moisture remains.

### **Bottom-line: Irrigation vs. the expense of other mid-season inputs**

Returning again to the scenario posed above about mid-season foliar feeding, in this instance (and many ones similar to it on other crops), a grower can be much more confident in a little extra water than whether a foliar feeding or some other input is worth it. Most of these micronutrient or foliar feed concoctions are unproven, but we know that too often farmers are willing to throw \$5 or \$10 or even \$20 per acre at a product in hopes (and often thin hopes at that) of hitting a home run. When spending money, do it with as much confidence in potential return as possible.

For further information on black-eyed pea production in the Texas High Plains consult <http://lubbock.tamu.edu/programs/crops/other-field-crops/black-eyed-peas/> Other information in Texas A&M AgriLife, such as <http://aggie-horticulture.tamu.edu/>, is oriented toward green and snap pea and bean production. Additional questions on black-eyed pea production, especially weed control, may be directed to Dr. Russ Wallace, Extension horticulture, Lubbock, (806) 746-6101, [rwwallace@ag.tamu.edu](mailto:rwwallace@ag.tamu.edu)

For additional soil, crop production, insect, plant disease, and irrigation information for the Texas High Plains call you local county Texas A&M AgriLife Extension Service office or visit the Texas A&M AgriLife Research & Extension Center websites at Lubbock, <http://lubbock.tamu.edu>, or Amarillo, <http://amarillo.tamu.edu>

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