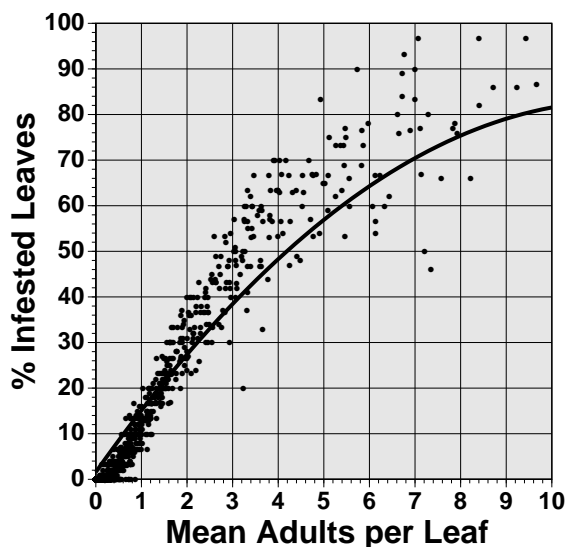


Sampling and action threshold plans for sweetpotato (a.k.a. silverleaf) whiteflies in cotton are outlined in the University of Arizona Cooperative Extension Publication (No. 196006), *Sampling Sweetpotato Whiteflies in Cotton*. This trifold publication explains a binomial sampling scheme using a leaf-turn technique. These plans were evaluated last summer within 190 commercial cotton fields (8,000 acres) in the Laveen-Tolleson area. We found this sampling protocol to be a practical and efficient way to track whitefly populations.

## How accurate is the sampling model?

The model on which sampling recommendations were based was evaluated by resampling the field data from Laveen-Tolleson numerous times on a computer. The figure below shows the correspondence of the observed (dots) and predicted (line) relationship between % infested leaves and mean adults per leaf in a field. This model generally over-predicted the mean number



of adult whiteflies observed for densities greater than 2 per leaf. This means that the recommendations are conservative, resulting in decisions to spray just before reaching the target threshold.

## Are 30 leaves enough?

The sampling model was further evaluated to determine the amount of variation associated with different sample sizes. On the average, a sample size of 30 leaves was more than adequate to make a treatment decision. However, the variances were large, so it is not prudent to sample less than 30 leaves, especially when whitefly numbers are close to 50% infested.

## How long does it take to sample?

Samplers used stop watches to keep track of the amount of time spent 1) walking from the truck to the first sampled cotton plant, 2) sampling whiteflies within the field and 3) walking back to the truck. Based on these data, we estimate an average of 8.5 minutes to sample 30 leaves in a field. The actual amount of time will vary with field condition and sampler experience.

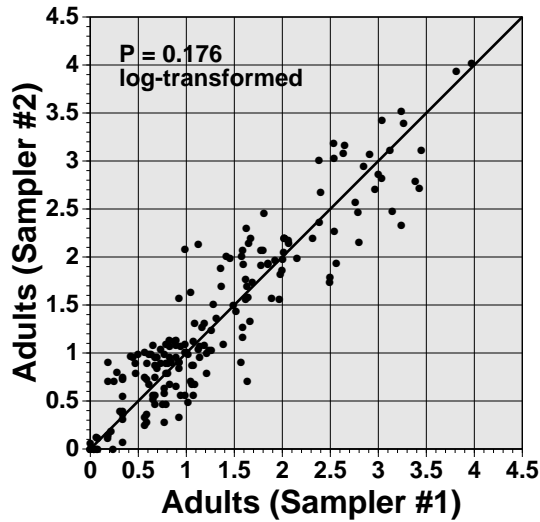
## Will different samplers get the same results?

Whitefly counts were taken by 14 different samplers within adjacent rows of a field on 12 different dates. These samplers varied in their amount of experience in sampling whiteflies; some had two years experience others had two hours. As shown in the figure below, sampler variation was not significant. This sampling

method, therefore, provides a common currency for growers, PCAs and others to compare white-

## How accurate is the sampling method for decision-making?

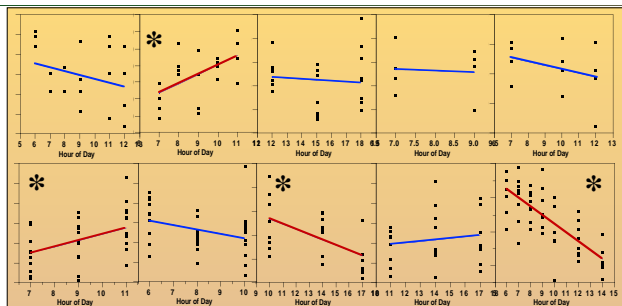
For a threshold of 5 adults per leaf, the binomial sampling method (infested-uninfested) provided the same decision as counting the total number of adult whiteflies on a leaf 1166 out of 1206



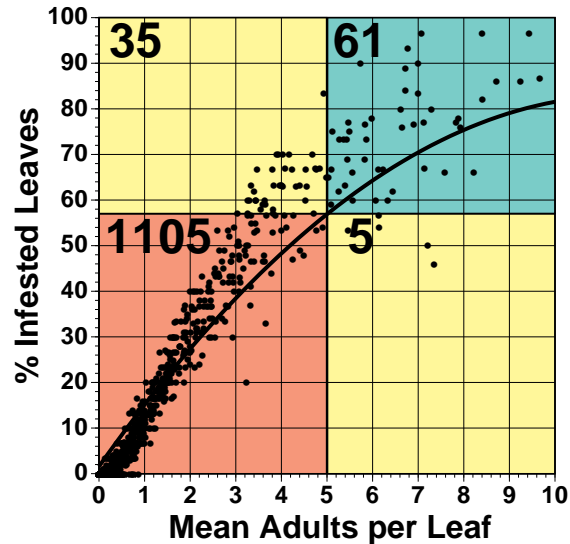
fly numbers among fields, even when the samplers are different.

## Can the sampling technique be used any time of day?

To find out the effect of time of day on whitefly numbers, 10 different fields were sampled multiple times over the course of a day. The figure below shows the change in whitefly numbers counted over time in each field. No consistent effect of time of day was observed. In the 4 fields indicated with an asterisk the mean number of whiteflies changed significantly with



time. Twice the numbers increased and twice the numbers decreased. Therefore, this method should be adequate for sampling both in the morning and in the afternoon.



times (96%). In 35 cases, the binomial method called for spraying when densities were below threshold, and 5 times this method called for not spraying when densities were above threshold. It is interesting that 4 of these 5 underestimates occurred on a day following rain. Based on these results, it is unlikely that a sampler would improperly assess the number of whiteflies by using this binomial sampling method.

## How much does it cost to sample for whiteflies?

The cost of sampling the Laveen-Tolleson fields over an 8 week period was approximately \$2.35 an acre. This breaks down to \$1.20 / acre for sampling, \$0.23 / acre for travel, \$0.72 / acre for management, and \$0.20 / acre for data processing.

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