Chemical defoliation of cotton has proved to be advantageous. In defoliated cotton the increased exposure to sunlight, plus the drying action of air movement tends to cause mature bolls to open faster, reduce boll rots, and retard fiber and seed deterioration. In addition, defoliation usually makes either mechanical or hand harvesting easier. These and other benefits have been outlined in some detail (2, 4).

Regardless of these benefits, many difficulties are encountered in adapting chemical defoliation to fit specific needs and plant types found in some areas of the irrigated Southwest. Cotton varieties utilized in most desert sections of the irrigated Southwest are indeterminate in growth habit. Consequently, plants grow tall, rank, and exhibit a heavy canopy of foliage. Under these conditions the damp environment sometimes found near the bottom of such plants will favor boll rot and delay boll opening. Harvesting will be delayed, grade lowered, and yields decreased.

Other problems are encountered during the defoliation season. Complete coverage of the foliage is usually stressed as a requisite for good defoliation regardless of the method of application. When plants are closely spaced and reach a height of 6 or more feet, defoliants do not always reach the lower leaves resulting in the need for a second application at additional expense.

Unfortunately, defoliation of the entire plant cannot always be used to combat early damage from boll rot. Premature, or early season chemical defoliation can cause injury to the fiber quality, reduction in yield, and other detrimental factors. The possibility of removing the lower leaves as a method to combat boll rots and delayed boll opening has been suggested (2, 3, 5); however, the feasibility of bottom defoliation would depend on how this process might affect the cotton plant. Other problems would be encountered such as: means and methods of application, rates per acre, and the timing of the application.

In order to investigate the general effects of defoliation on the cotton plant several experiments were conducted during 1951 and 1952. The data...