another way, had there been a weak monsoon with very dry weather as was more typical in the earlier 1990’s, 4 or 5 conventional sprays might have been required in 2000. In general, however, 1995–1997 required 5–6 conventional sprays, while 1998–2000 required only 1–3 conventional sprays. The specific reason for these differences is under investigation but likely was a result of weather, predation, and unknown factors as well as the surrounding ambient density of SWF.

The IGR regime performed exceptionally well in all years requiring usually just 1 spray to manage SWF season-long (Fig. 4). The IGR regime required on average 1–3 fewer sprays against SWF than did the conventional regime. Only in 1998 were the spray requirements the same (1). The SWF dynamics in this year were extraordinary in that threshold levels were present statewide during the first week of August, but then spontaneously crashed even in untreated plots and commercial fields. As measured by large nymph densities (Fig. 4), threshold levels of SWF were reached at distinctly different times each year. Due to the time lag effects inherent to IGR’s, the peak nymphal densities were always reached about 1 week after IGR use. The characteristic precipitous decline thereafter was often followed by 3–7 weeks of subthreshold SWF densities.

This historical comparison is useful in re-evaluating University recommendations within a commercial-scale context and for re-visiting the relative utility of conventional chemistry vs. IGRs, a choice growers face each year. Also, this comparison provides a useful “what if” situation where we can see the importance of properly deployed IGRs in combatting SWF more economically and more eco-rationally. Furthermore, it is apparent from this exercise that this integrated use of IGRs and all the associated research, implementation, and education are likely mostly responsible for the staggering reductions in insecticide use against SWF in Arizona cotton. This conclusion is supported by independent analyses of pesticide use trends.

Figure 3 & 4: Historical trends in whitefly populations dynamics (adults per leaf & large nymphs per disk) and conventional (top) & IGR (bottom) spray requirements from large-scale, replicated experiments. The same sequence of conventional insecticides (top) was used in each year according to a rotational regime identified in 1995 for resistance management. Insect growth regulators (IGRs) were used before conventional chemistry in each year (data for Knack first shown only; bottom). Arrows above chart indicate frequency and timing of sprays by year. Numbered points on lines correspond to the last digit of the year (e.g., ’8’ for 1998). Cloud-bursts above chart denote rain events for each year.