'Bugging': Fresno Lab Makes Good, Bad Pay

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ment, as the barely two-year- old consulting service is known, is designed to provide bug bedeviled San Joaquin Valley farmers in several crops with life-saving scientific advice and coaching on bug control

Their principal targets are California red scale in citrus and worms afflicting cotton and tomatoes as well as the tuber moth in potatoes They also have advisory plans they offer growers of grapes figs almonds and alfalfa, most employing integration of chemical with biological control methods

The hottest item right now is the red scale because the summer flight of the males (delayed two to three weeks this year by our cold spring weather) is just winding up its first peak period. And this is one of the most important parts of their program for arriving at the proper control procedures.

They provide a survey, employing sex attractant traps much like those used in tracking the pink bollworm in cotton, which pinpoints the hot spots of the infestations as populations rise. They start in March with a pilot trap set every 100 to 150 acres, changing them weekly until the fall rebound occurs in November. This way they can plot the hatches week by week and track them geographically in the orchards to zero-in on the destructive pests.

"This is our newest and most exciting venture," the tall, intense Michael says. "As soon as a population increase is seen, we move in with a concentration of survey traps, setting out one trap for every three to four acres for the next week ortwo. This is where we can prove our value to the orchardist. The old way of surveyibg orchrds by random samples of leaves and branches is expensive because of the man-hours involved. It can also be expensive because it can easilymiss a hot spot that will turn out swarms of males for breeding right after the sampler has passed through the orchard.

"The trap system is immensely more accurate. The sticky cards on top of each trap catch the flying males (they only last 24 hours as breeders but they can fly against the wind several hundred yards and spread the infestation amazingly in the single day they last to mate and die) and provide solid mathematical evidence of the hatch.

Michael, who was trained in toxicology and plant pathology at Cairo University in the '60s (that's right Cairo, Egypt), points out the tricky part of this work is the fact there is no synthetic pheromone to imitate the female red scale's alluring sexual perfume. The pink bollworm's heady scent was successfully synthesized several years ago.

Consequently, a large part of Michael's and Smith's time is spent in supervising the raising of colonies of virgin red scale females. You got that, didn't you? The word was "virgin" and it is vital to their success.

Little Mr. Red Scale, limited to just one day of romancing in his life cycle, is picky, picky. No fallen maids for him. He's not like Harold Hill, The Music Man who said he preferred the "girl too late to save." No, sir, he is hot for the girl just like the girl who married dear old Dad and purity is everything to him.

So, they operate meticulously guarded hatcheries using thousands of green lemons to raise the necessary virgins (which necessitates killing off each generation's accompanying males in the brief span between their attainment of sexual maturity). Then the lemons go into the pint size ice cream cartons rigged as traps for their critical measuring job in the citrus groves. It is a tricky process. Timing is honed as fine as mosquito's beak. And quarantinelike safety precautions must be followed to avoid escapes or contamination by other insects getting inside.

But the job is only half done once they show a grower where his scale problem lies. Next they coach him on his approach to control. And this brings in another clan of insects along with the spray crews, with timing planned to get the most out of each.

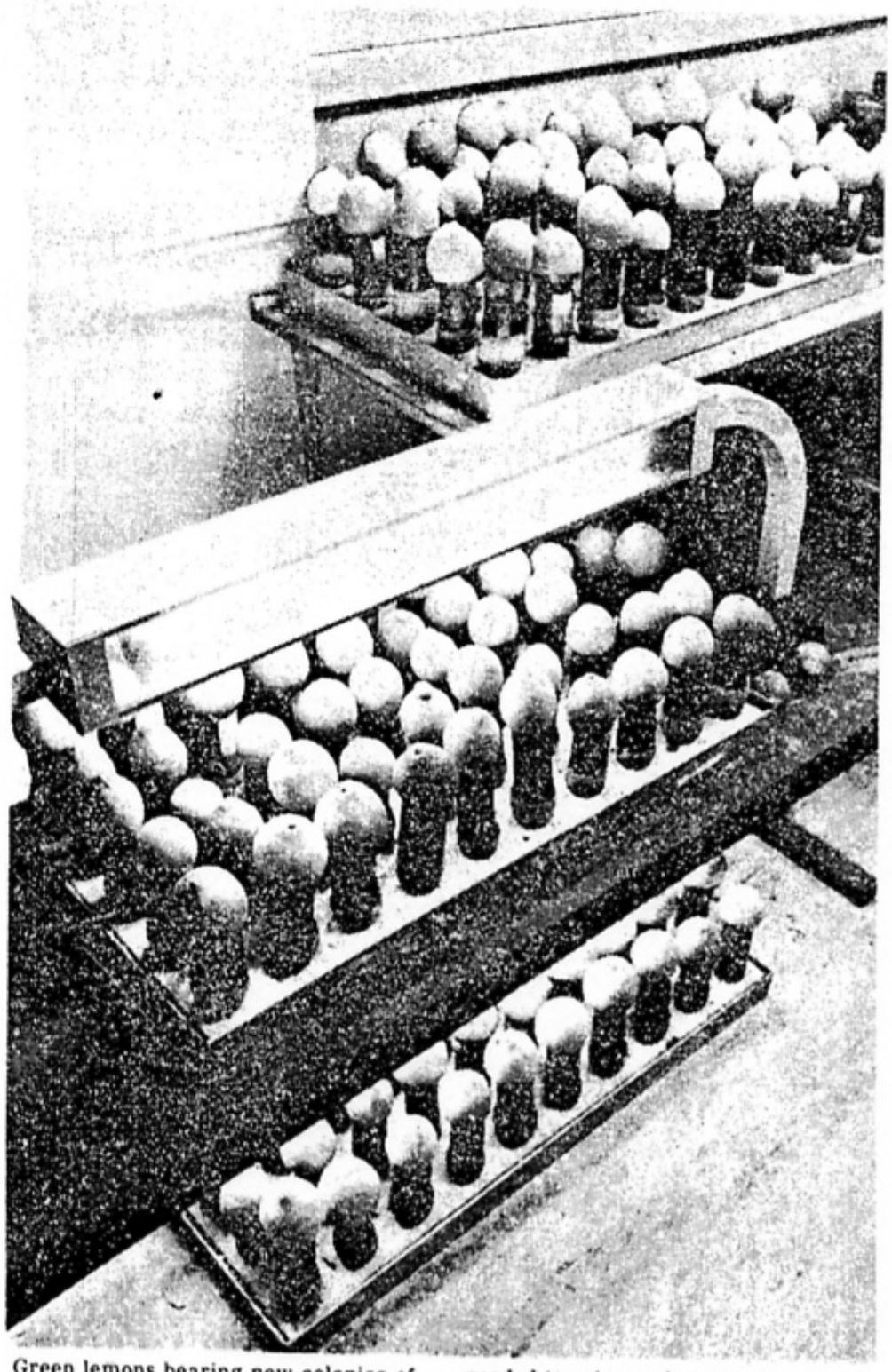
And here is where they are into the "livestock" business again, only they are growing the enemies of the red scale for this. Two tiny parasitic benefactors of mankind are hatched by the millions on stacks of banana squash in their lab.

One is Aphytis melinus, a tiny wasp that can land on a pinhead with space left over, and the other is Comperiella bifascista. Both do their destructive job on red scale by depositing their eggs inside the waxy shell of the pest as it clings to the citrus like a microscopic abalone. Their young finish the job as they hatch and feed on their unwilling hosts.

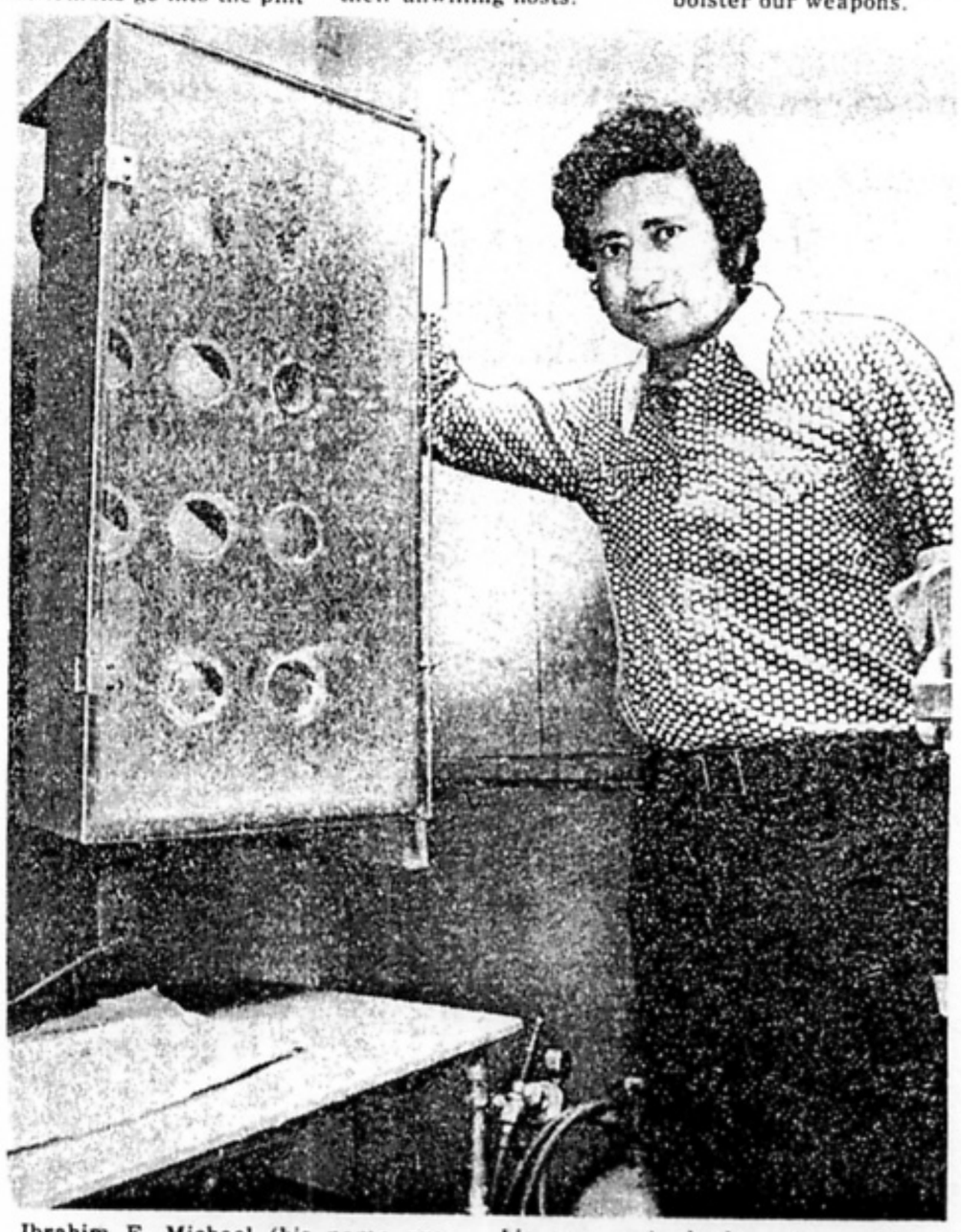
Both are released by thousands when the sticky cards on the white cylinder traps show heavy flights of brood ready males. These tiny destroyers can do a far better job of control than spray booms because they can get inside the tightest foliage to hunt out their prey. But Michael and Smith do not say the little hunters can entirely replace spray crews, although they do have one subscriber to their service who has gone two years without spraying.

They point out that just as no spray can do the control job alone, neither can their helpful little flying killers go it alone. Integration of the two, along with learning to live with the pest where it can be brought down to the point the trees' vigor can withstand moderate infestations, is the most satisfactory goal, say the combination bug breeders and killers.

They point out that their traps are beginning to level off and soon will show a decline of scale activity for a few months until the pre-Thanusgiving rebound occurs. Then they and their tiny helpers will be on the go again, proving how integrating chemicals with living helpers from the insect world can bolster our weapons.



Green lemons bearing new colonies of red scale being grown for later use as lures in the sex pheromone traps are seen under special lights in the Michaels' insectary. A special wax is used to coat a large portion of the lemon to preserve it for the period needed to raise each generation of red scales. An antiseptic dip just before they are put in the traps kills the males, leaving behind only the virgin female red scale to attract the "wild" males in the grove and show the population level.



Ibrahim F. Michael (his name preserves the Egyptian form in the first name and uses the Anglicized form in his surname) checks out a cabinet used in growing new supplies of tuber moths.