Humans and Other Pollinators in the Oil Palm Plantation Complex

Jonathan Robins

Summary

The first oil palm plantations relied on human interventions for the sexual reproduction that made the palm oil industry possible. Scientists discarded evidence about insect pollinators, only to rediscover them later in the twentieth century. The "million dollar weevil" transformed oil palm cultivation in Southeast Asia, but new problems with disease and hybrid trees cast shadows over its future.

A mature oil palm plantation near Melaka, Malaysia.

Photograph by Jonathan Robins, 2016.

The African oil palm (*Elaeis guineensis*) is one of today's most controversial plantation crops. Its fruit is the

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source of palm oil, a fat used in everything from fast food to biodiesel. For over a century, humans have converted millions of hectares of tropical forest to plantation monoculture to cultivate the oil palm. But until the 1980s, this wasn't enough: without human help in its sex life, the oil palm plantation would have been a fruitless venture in the most literal sense.

When Europeans carried *Elaeis guineensis* from its homeland in western Africa to Southeast Asia in 1848, they left its native pollinators behind. Initially, that didn't matter: after failed experiments with palm oil production, the trees were relegated to ornamental roles. That changed in 1911, when the first large-scale oil palm plantations broke ground, hoping to compete with Africa's long-established export trade in palm oil. Plantation managers dealt with pollination the same way they built their plantations and harvested palm fruit, with cheap labor. Workers bound by coercive "coolie" contracts carried out this reproductive work, gathering pollen and dusting it onto female flowers, marking each blossom with a dot of paint to prove the work was done.

A worker posed next to gigantic fruit bunches, the result of artificial pollination.

Unknown photographer, n.d.
Originally published in Rutgers and Blommendaal (eds.), *Investigations on Oilpalms made at the General Experiment Station of the A.V.R.O.S.* (Batavia: Ruygrok & Co., 1922).

Artificial pollination was one part of the anthropogenic nature the oil palm plantation represented, combining land, plants, and people into what one observer called "a machine for turning fertiliser into oil." The economic value of this oil machine was clear by the 1930s, when Southeast Asia's palm oil exports shot past Africa's. Artificial pollination was so successful that colonial scientists rejected earlier suggestions that the oil palm had

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evolved with insect pollinators. R. B. Jagoe declared in 1934 that the trees were "undoubtedly wind pollinated," though wind pollination alone produced erratic fruit yields.

Plantations, Michael Dove argues, erase and remake knowledge just as they remake forests into monocultures. In this case, Jagoe and his colleagues ignored evidence from Africa that pointed to insect pollination. Observers could plainly see weevils in the *Derelomus* tribe visiting oil palm flowers, drawn to the strong anise-like scent of the flowers. The work of forgetting this knowledge was, in part, due to caution. Experts who studied the weevil noted its habit of laying eggs in palm flowers and damaging them. One scientist warned against importing it Asia in 1922:

> We do not yet know whether its danger as an enemy is not greater than its usefulness and we do not know what ill we may perhaps be importing. (Heusser 1922: 55)

A female oil palm weevil, *Elaeidobius kamerunicus*.

Photograph by Ken Walker, 2006.
Courtesy of PaDIL and Museum Victoria.
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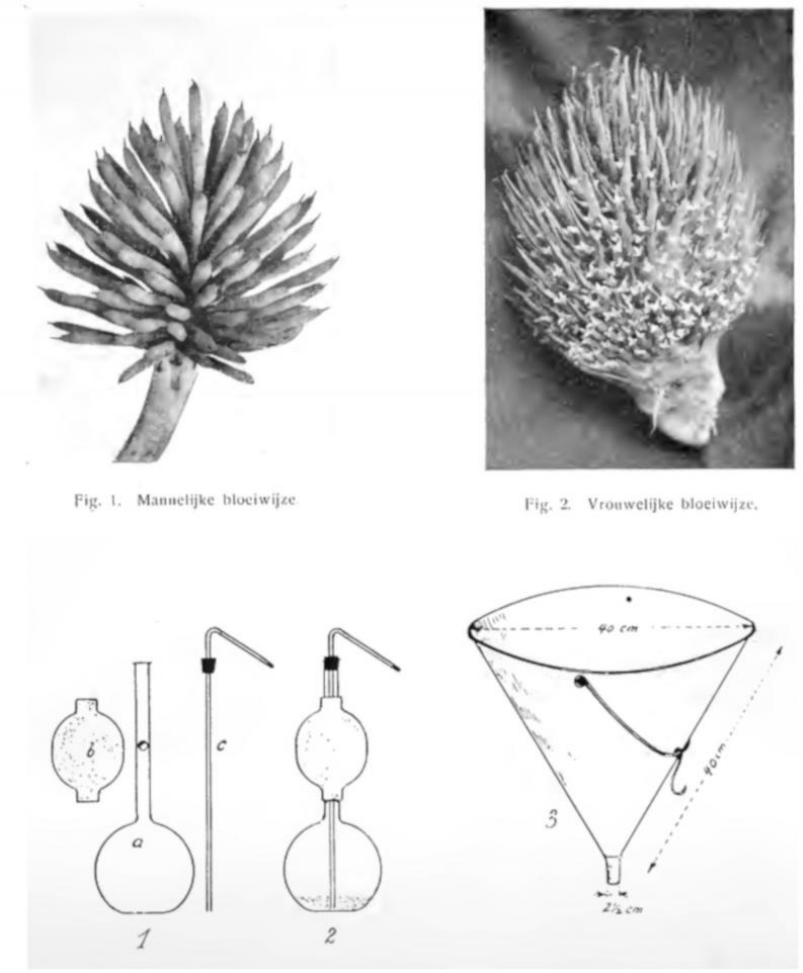
The economic success of artificial pollination made it easy for scientists to forget the weevil. But the material and human conditions that made artificial pollination viable began to unravel in the 1940s–1950s. Labor militancy, smallholder activism, and freedom from colonial rule remade the political economy of labor for the plantations. The palms had their own agenda, too: now over 20 years old, most plantation palms in the region had grown to

towering heights by the 1940s. Pollinating and harvesting fruit became slow and hazardous tasks accomplished on ladders. For the tallest palms, plantation managers let the wind and native insects like *Thrips hawaiiensis* do the work. Many plantations began cutting down and replacing palms with higher-yield hybrids in the 1960s, restarting the cycle.



Top: Male and female oil palm flowers; Bottom: Equipment for collecting and dusting oil palm pollen

Unknown photographer, n.d.
Originally published in Rutgers and Blommendaal (eds.), *Investigations on Oilpalms made at the General Experiment Station of the A.V.R.O.S.* (Batavia: Ruygrok & Co., 1922).

Fast forward to 1976. Leslie Davidson, an executive in Unilever's plantation wing, was flummoxed by poor pollination rates on plantations in Sabah. He convinced his company to experiment with weevils he had "discovered" years earlier crawling out of palm flowers in Cameroon. An international group led by Dr. Rahman Anwar Syed studied the weevils in Cameroon before releasing one species, *Eleaidobius kamerunicus*, on Unilever's Mamor Estate in the Malaysian state of Johor in 1981. The experiment was a smashing success. *E. kamerunicus* slashed pollination costs to zero. New introductions soon brought this "multi-million dollar weevil" to Borneo, Sumatra, and beyond.

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The *E. kamerunicus* introduction defied conventional wisdom about the dangers of moving insects. It remains reliant on oil palms for food and reproduction, and no harm to indigenous species has been documented so far. Importantly, the weevil was what Anna Tsing, Andrew Matthews, and Nils Bubandt call a "feral proliferation." It was a living technology that ignored property boundaries and managerial designs in its quest for oil palm flowers. The weevil did the same labor for smallholders that it did on plantations, dramatically boosting yields and setting the stage for a massive increase in oil palm plantings after 1990.

The weevil was a "natural" solution to a problem of the plantation industry's own making. But no solution is permanent in agriculture, where human and natural processes interconnect. Pesticides used to control pests kill off weevil populations, and climate change may be weakening the weevil's response to oil palm flowers. Some plantations now hatch weevils and spray them with pollen before releasing them, bringing pollination back under human control. Other "feral proliferations" among oil palms include diseases like *P. palmivora*, which ravaged plantation monocultures in Colombia in the last decade. These threats to the anthropogenic plantation landscape, in turn, inspire more interventions in the oil palm's sex life, as scientists try to breed more resilient and more productive oil palms. For some of these palms, the pollination story has come full circle. As Michael Taussig jokes, the most promising disease-resistant hybrids "can't get it up" on their own, requiring a delicate dusting of pollen with human hands to keep the oil machine running.

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Further readings:

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Related links:

- Paul Tullis, "How the World Got Hooked on Palm Oil," *The Guardian*, 19 February 2019 https://www.theguardian.com/news/2019/feb/19/palm-oil-ingredient-biscuits-shampoo-environmental
- Angela Serrano, "Can Small-Scale Farming Save Oil Palm?"*Edge Effects*, 20 February 2020.

https://edgeeffects.net/small-scale-oil-palm/

- Interview with Jonathan Robins on *Oil Palm: A Global History*
  https://www.environmentandsociety.org/node/9336

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Websites linked in image captions:

- https://www.padil.gov.au/pests-and-diseases/pest/main/140666

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