

● REC TFH HI C14-12 01/10

The Papaya Was Engineered. So Was the Rescue System.

Rainbow papaya did not save Hawai'i's papaya industry by itself. A rescue system had to be engineered around it.

Photo: Greb, USDA ARS

Frame: Wolfgang Stief, CC0, cropped
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02/10

Papaya ringspot virus spread through Hawai'i's production system, damaging plants and threatening commercial growing.



Photo: Scot Nelson, CC0

Frame: Wolfgang Stief, CC0, cropped
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03A/10



**Virus-resistant papaya
was a major technical
intervention,**

Source: Smithsonian NMAH

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**but a resistant plant is
not yet an industry
rescue.**

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04/10

A photograph of a man and a woman in a greenhouse. The man, wearing a blue and white floral shirt, is holding a small plant. The woman, wearing a black shirt, is looking at the plant. They are standing in front of a large greenhouse structure with a black frame and a translucent covering. The background shows lush greenery and palm trees.

**Research, seed
production, regulation,
grower adoption,
extension, markets
and trust all had to
connect.**

Photo: Greb, USDA ARS

Frame: Wolfgang Stief, CC0, cropped
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The record, in dates

By 1986 The researchers had cloned the coat protein gene of the virus

1988 They started transforming papaya cultures

1992 Papaya ringspot virus detected in Puna

1995 Large Puna field trial begun

Photo: Wayne Nishijima, CC0

Frame: Wolfgang Stief, CC0, cropped

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September 1996

USDA removed
regulatory restrictions
on SunUp and Rainbow

EPA

Exempted the viral coat protein
from the requirement of a
tolerance

FDA

Completed a food-safety
consultation on the SunUp line
(BNF-042)

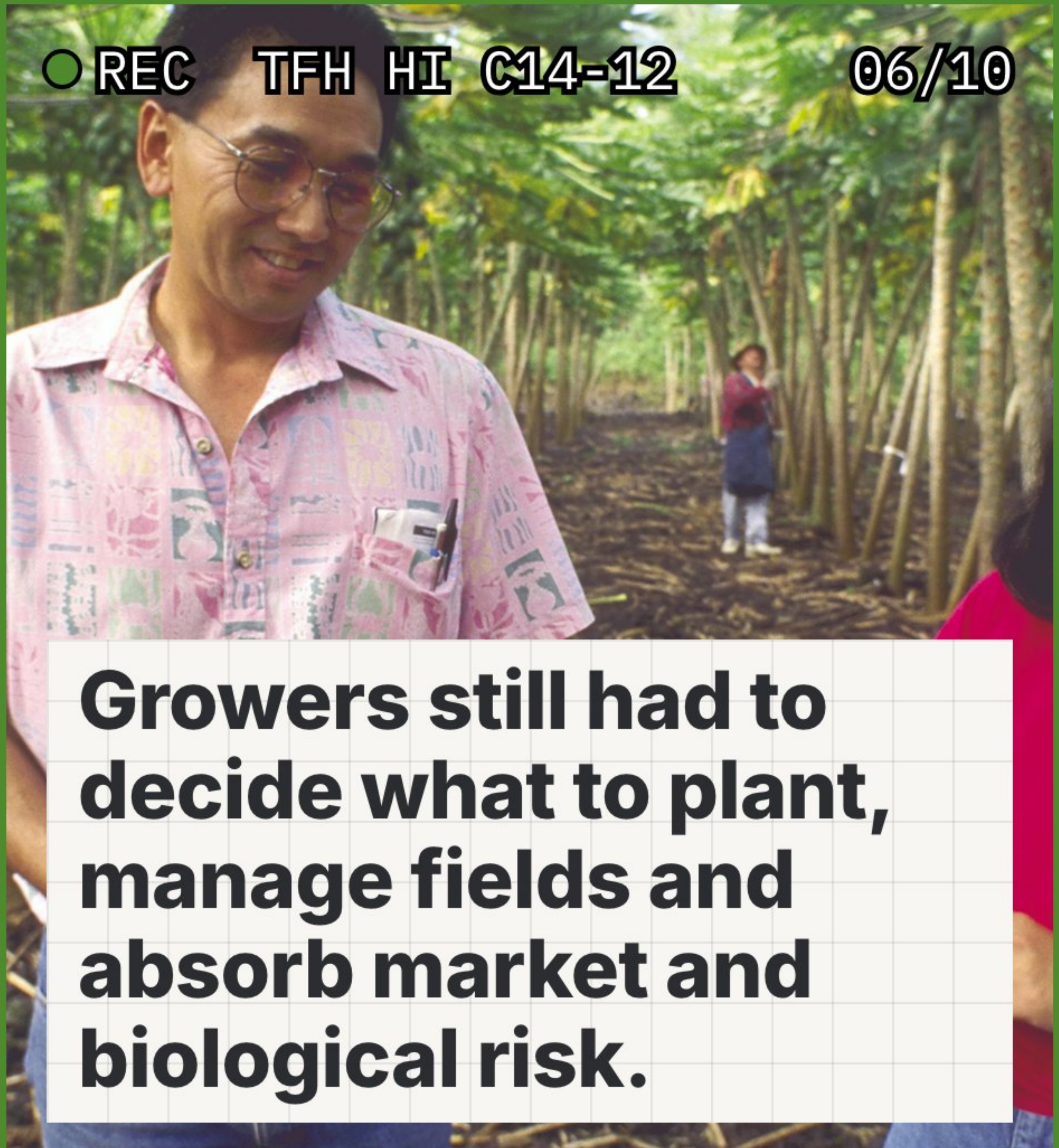
Photo: Forest and Kim Starr

Frame: Wolfgang Stief, CC0, cropped

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06/10



**Growers still had to
decide what to plant,
manage fields and
absorb market and
biological risk.**

Photo: Ron Nichols, USDA NRCS

Frame: Wolfgang Stief, CC0, cropped
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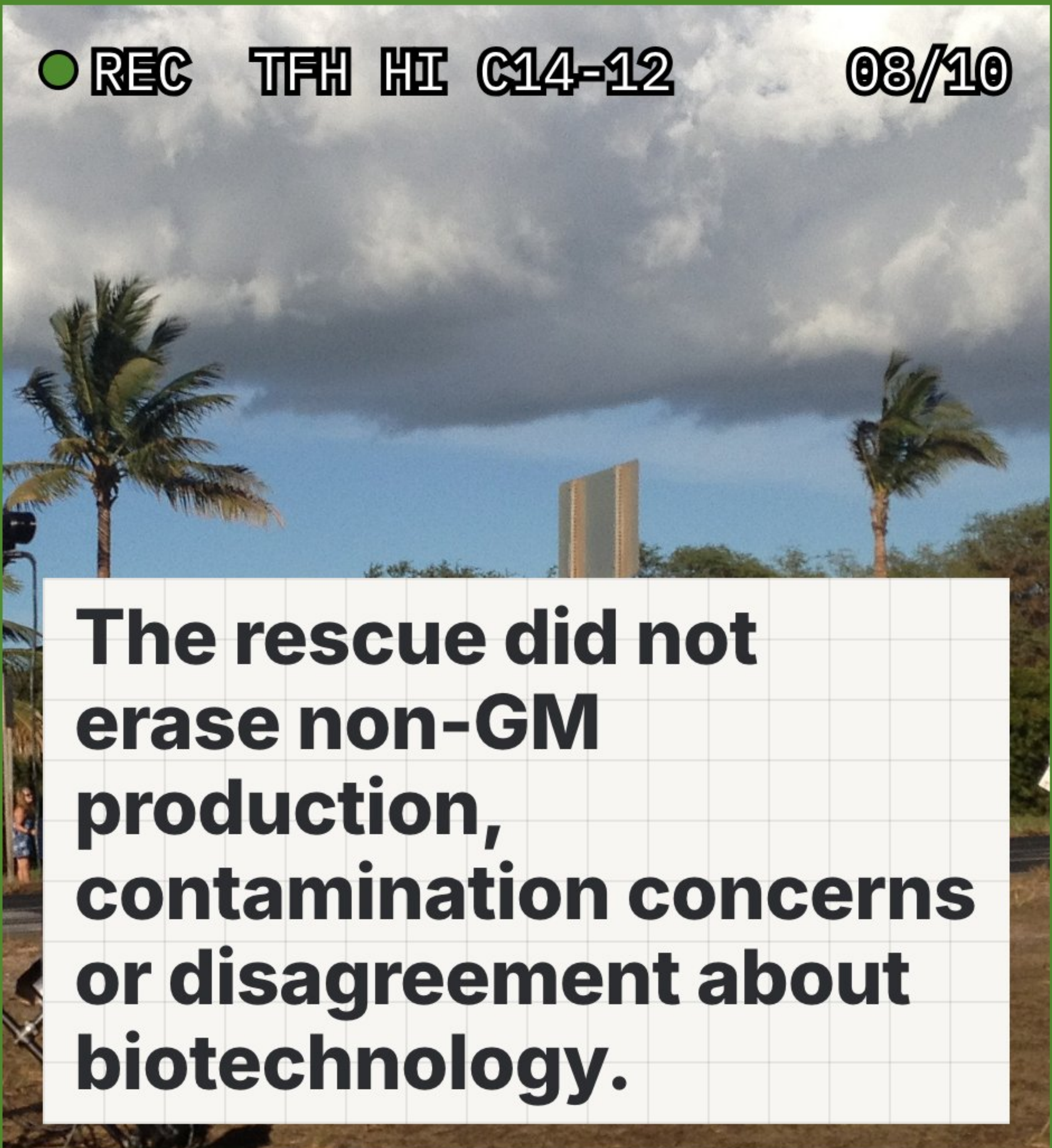
**A crop can work
agronomically and still
encounter export
rules, buyer
preferences and public
resistance.**

Photo: Scott Bauer, USDA ARS

Frame: Wolfgang Stief, CC0, cropped
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08/10



**The rescue did not
erase non-GM
production,
contamination concerns
or disagreement about
biotechnology.**

Photo: Viriditas, CC BY-SA 3.0

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● WHAT WE ACTUALLY KNOW 09A/10



What We Actually Know

What we know

In a large Puna field trial begun in 1995, transgenic plants remained resistant under heavy disease pressure while susceptible comparison plants became infected.

Photo: Stephen Ferreira, CC0

Frame: Wolfgang Stief, CC0, cropped

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● WHAT WE ACTUALLY KNOW 09B/10



What we don't

"Saved the industry" is shorthand. Outcomes varied by place, grower, market and time. Rainbow may be one cause among several.

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**Rainbow papaya
mattered because
institutions and people
built a rescue system
around the seed.**

- ☐ Read the USDA and UH record
- ☐ Read the stakeholder limitations

Photo: Greb, USDA ARS

Frame: Wolfgang Stief, CC0, cropped

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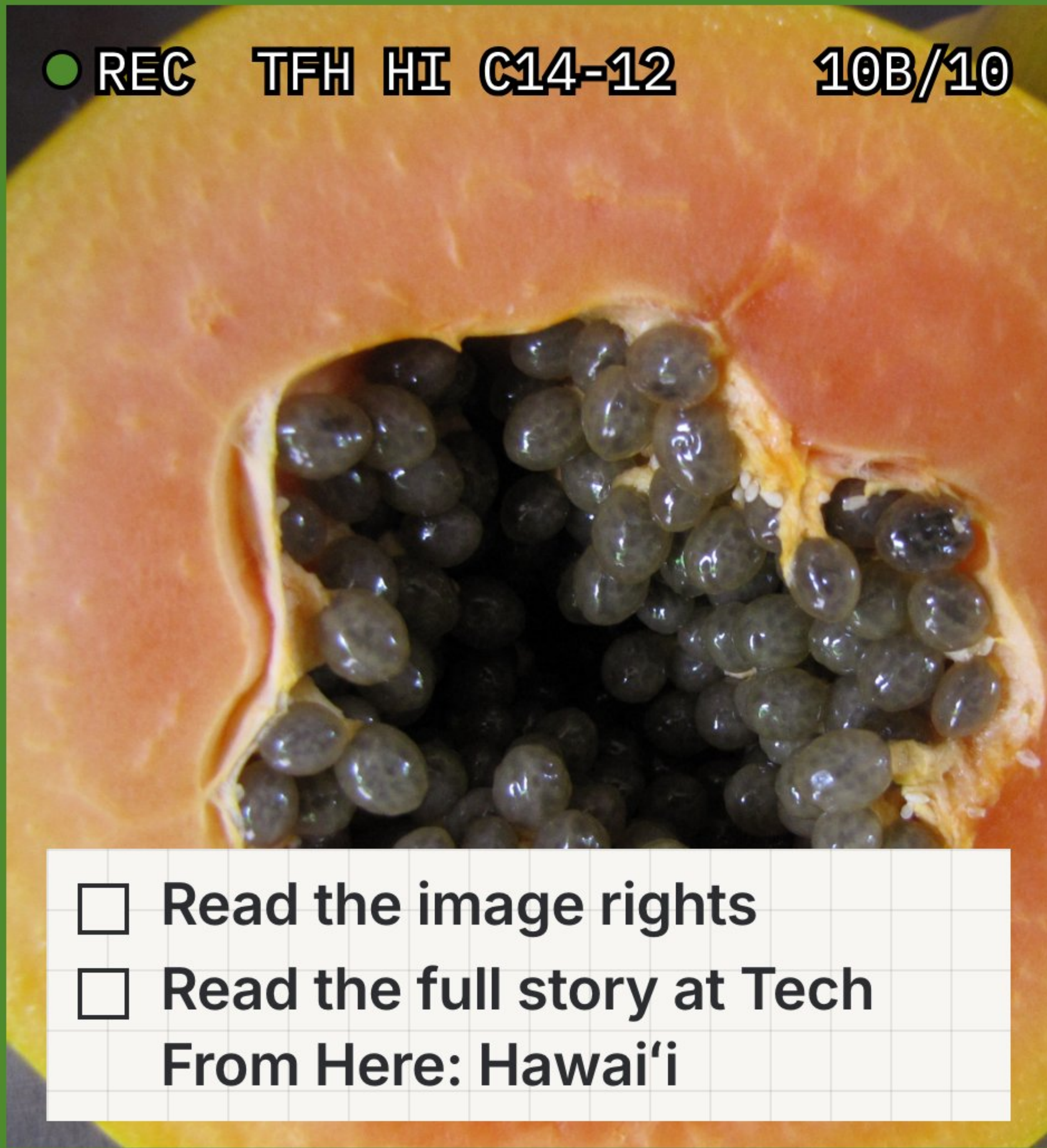
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- ☐ Read the image rights
- ☐ Read the full story at Tech From Here: Hawai'i

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