

Eradication of the oriental fruit fly, *Bactrocera dorsalis* in Amami Island, Japan (2015-2016)

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Abstract

In June 2015, the oriental fruit fly (OFF) was discovered in Amami Island (819 square kilometer), Kagoshima Prefecture, southwestern part of Japan. MAFF and local governments conducted control action. By the control, OFF was successfully eradicated in July 2016, after one year from the first detection. In this presentation, I would like to explain the invasion and eradication process of OFF, as well as the history of OFF invasion and eradication of Japan in the past century.



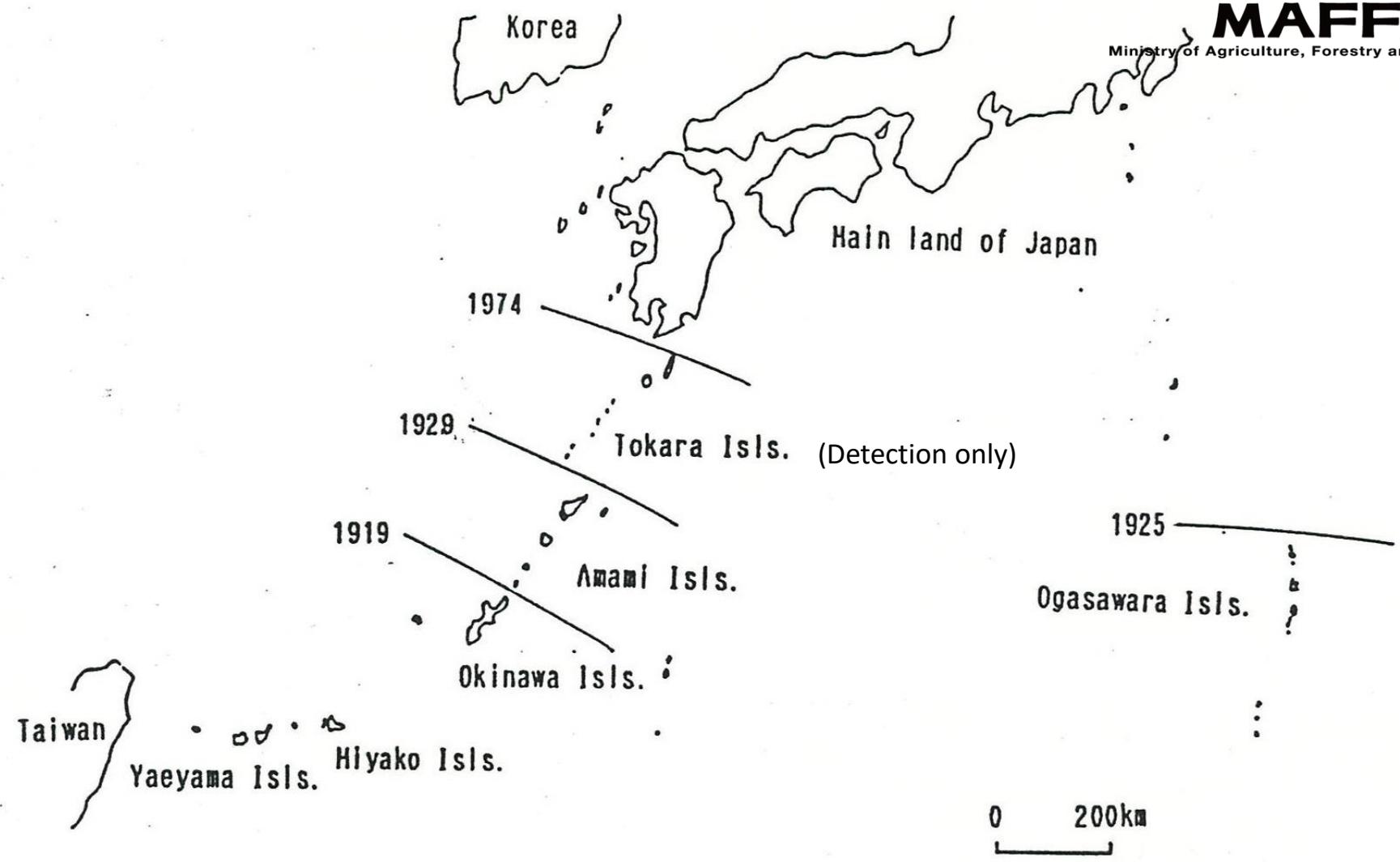


Fig. Invasion and distribution limit of the oriental fruit fly, *D. dorsalis* in Southwestern Islands

The oriental fruit fly did not colonized in the north part from Tokara Islands

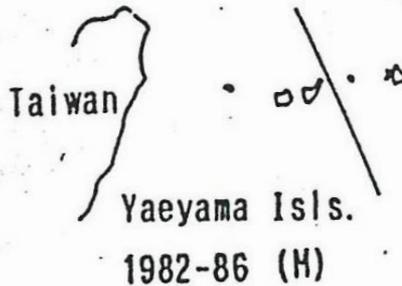
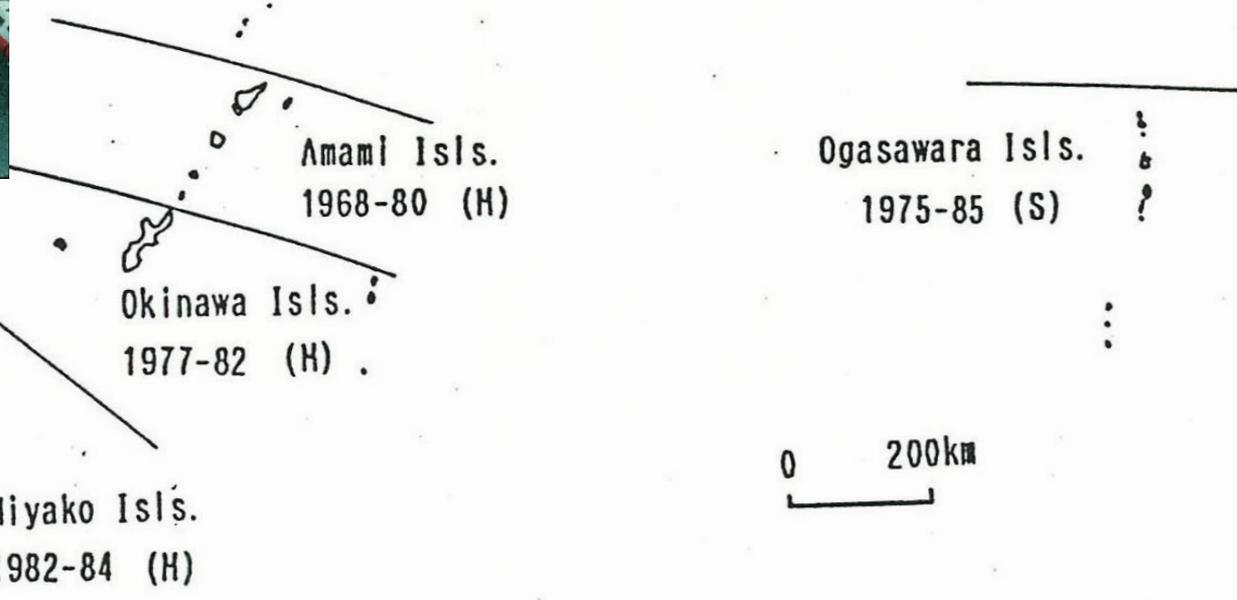
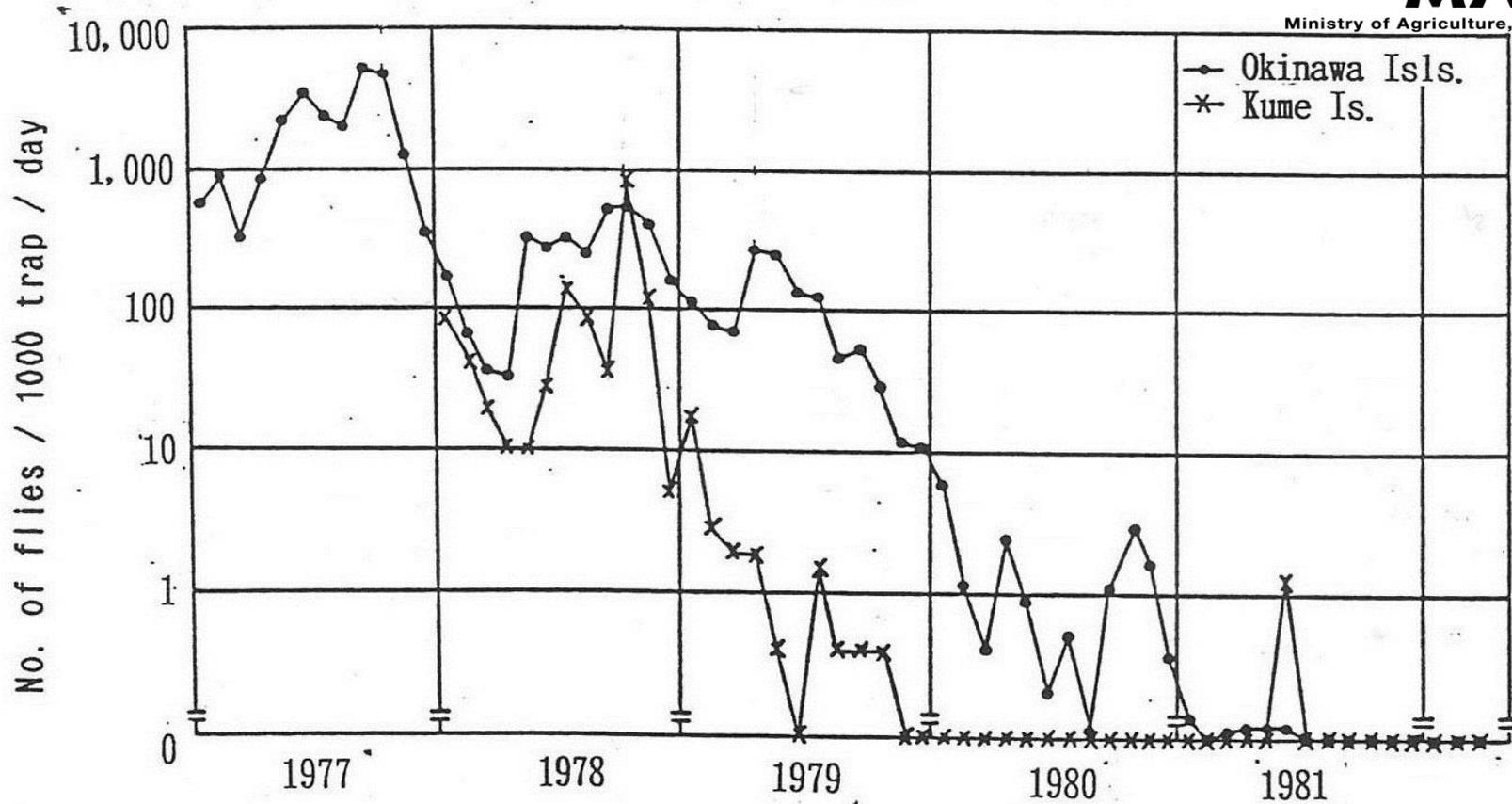


Fig. Eradication program of the oriental fruit fly, D. dorsalis :
In Southwestern Islands and Ogasawara Islands

H: Male annihilation method S: Sterile insect release method



Trend of the number of the oriental fruit fly caught by monitor traps in Okinawa islands



Table Eradication control of the oriental fruit fly by male annihilation
(Case of Okinawa Pref.)

Methods	Form of chemicals	Density of chemicals (pieces/ha/month)	Target area
Aerial distribution	Tex plate soaked with Methyleugenol +BRP	1.2 - 2.0 2.4 - 8.0	Field, Plain High density area
Ground distribution	Tex plate soaked with Methyleugenol +BRP	2.4 - 3.3 7.6	Residential area High density area

Tex plate is made of fiberboard (4.5 × 4.5 × 0.9 cm).



OFF in Amami Island (First detection – confirmed eradication)

Stage 1: Early stage of expansion in two areas (June –August, 2015)

Stage 2: Population expansion in south area (September – October)

Stage 3: Population expansion into north area (November) , Emergency action decided

Stage 4: Last detection (December)

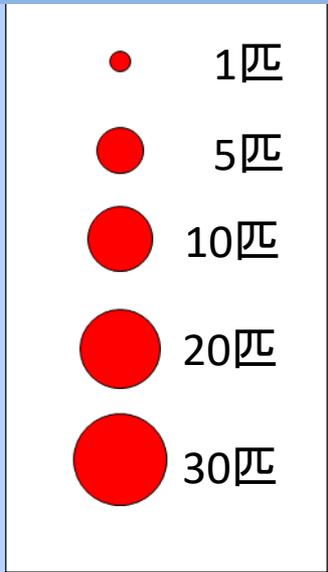
Stage 5: Confirmed eradication (January-July, 2016)



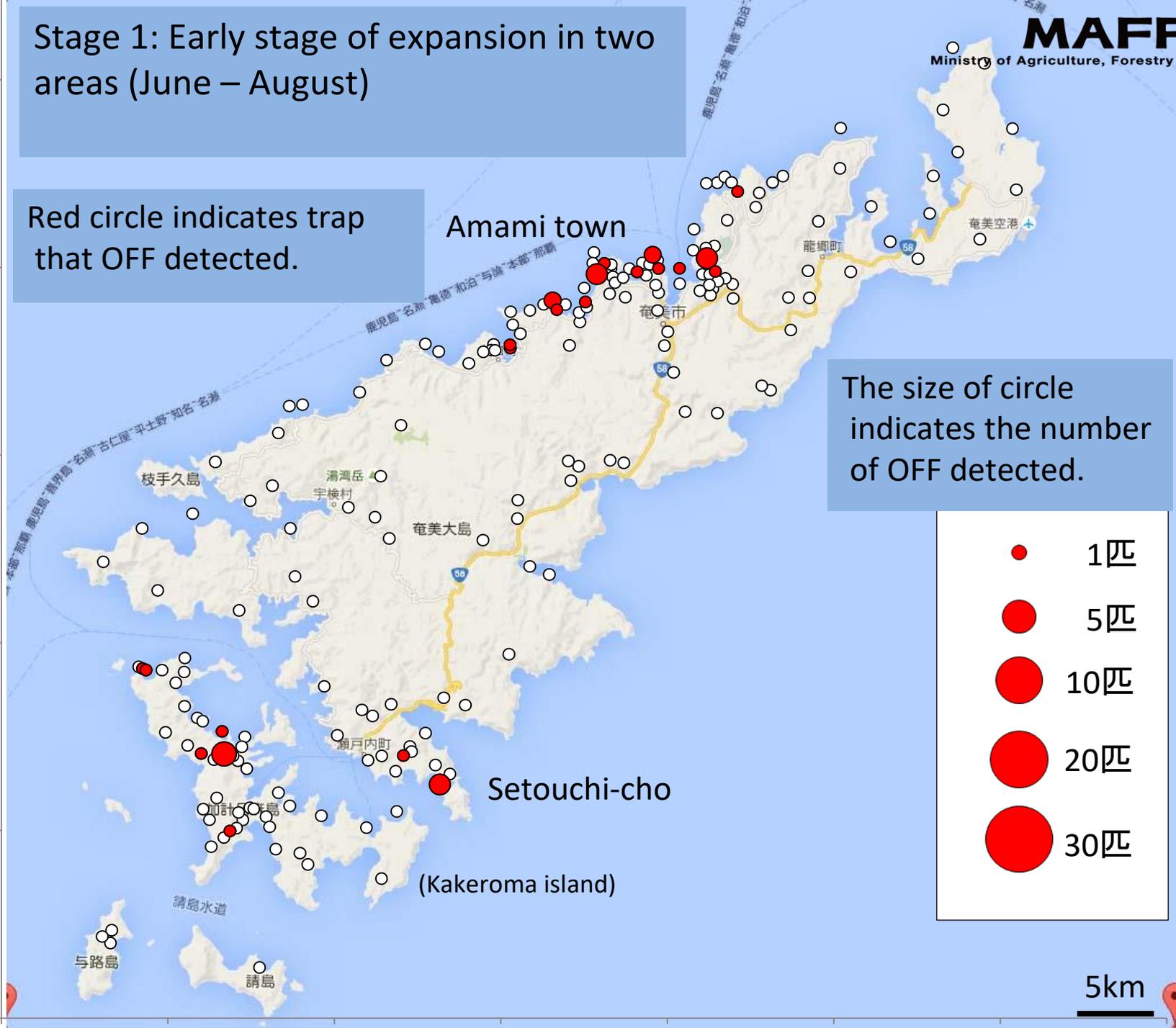
Stage 1: Early stage of expansion in two areas (June – August)

Red circle indicates trap that OFF detected.

The size of circle indicates the number of OFF detected.



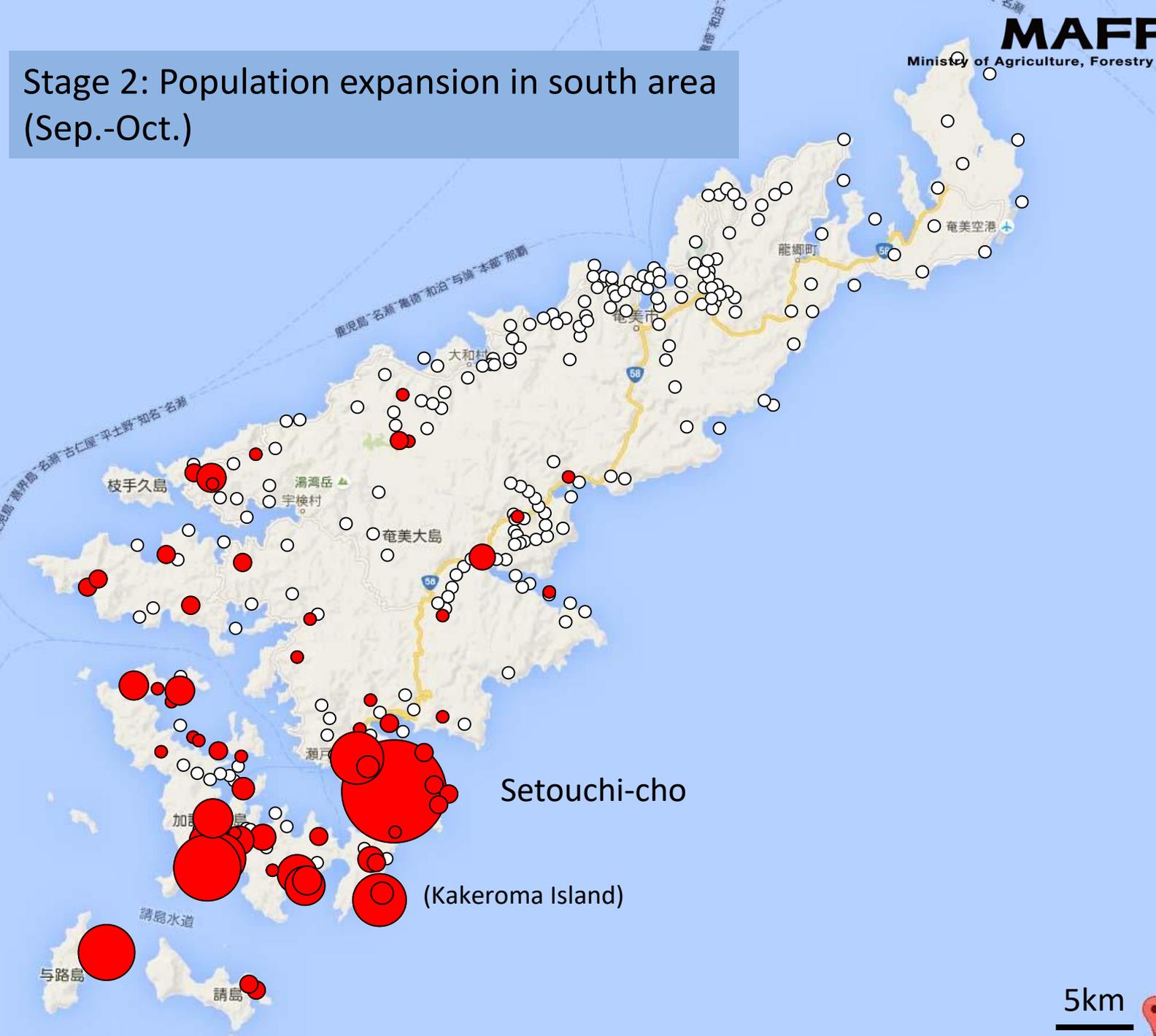
28.5
28.4
28.3
28.2
28.1
28



5km

Stage 2: Population expansion in south area (Sep.-Oct.)

28.5
28.4
28.3
28.2
28.1
28



5km

Outline of the eradication control of Amami Island (2015-2016)

1. Eradication control by tex plate (metyleugenol) and other means

- Ground distribution for residential area (started in July 2015)
- Aerial distribution for mountain, field etc. (started in Nov. 2015)
- Protein bait spray for larvae detection site (started in Sep. 2015)
- Host fruit stripping (started in Sep. 2015)

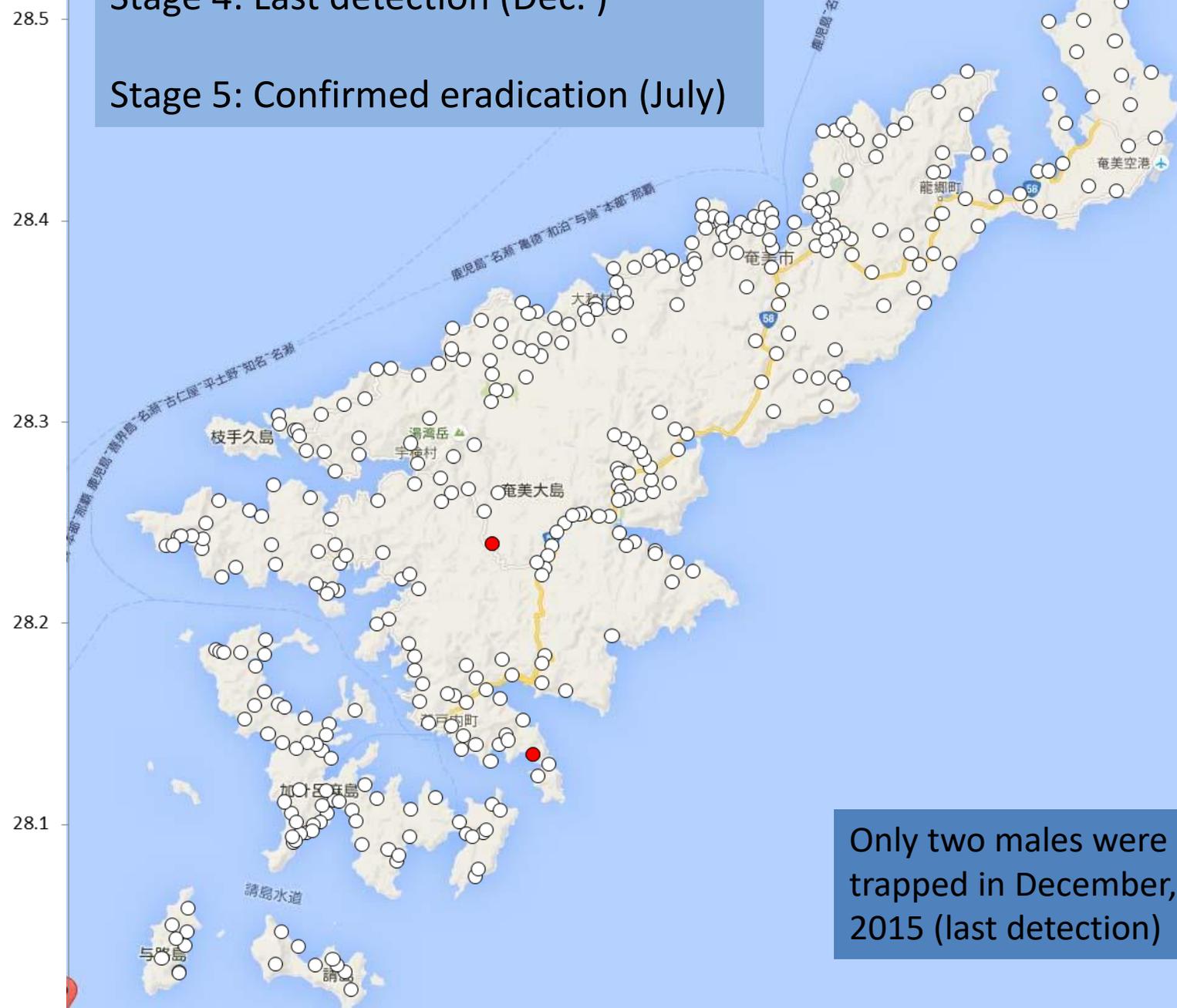
2. Strengthen of trap survey (additional traps and frequent check of trap)

3. Prohibition of host fruit movement from infested area (5km radius)

4. Disposal of host fruit produced in the infested area



Stage 4: Last detection (Dec.)
Stage 5: Confirmed eradication (July)



Only two males were trapped in December, 2015 (last detection)

5km

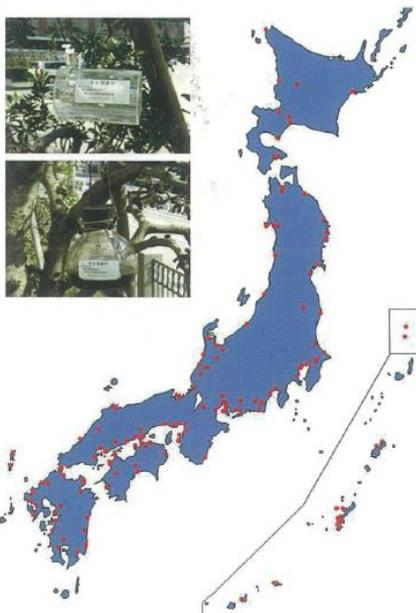
Lessons learned

(Positive) Maintaining sufficient stock of tex plate (ME) is essential for early response and emergency control in case of outbreak. Trapping with ME is quite reliable way to make early detection and monitor OFF's population precisely.

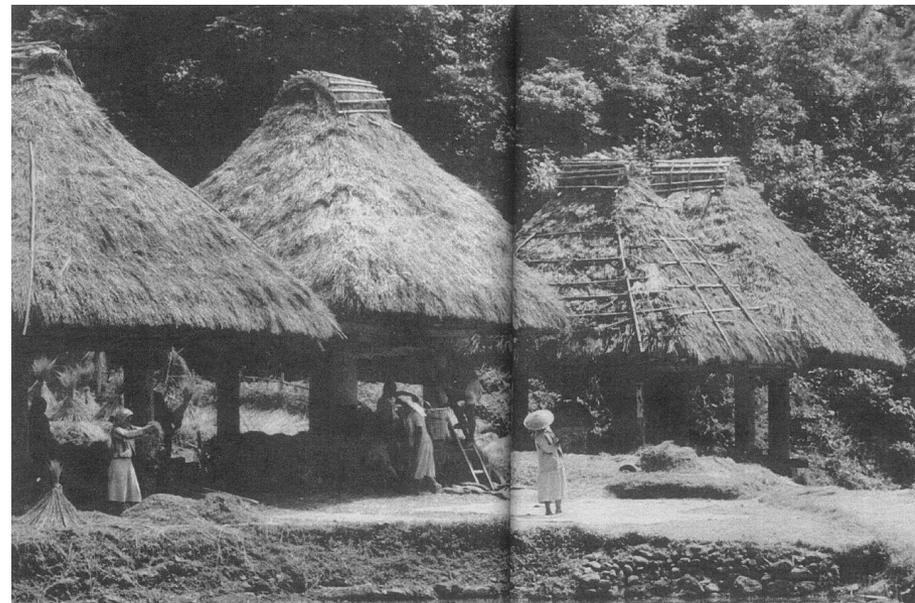
(Negative) Insufficient amount of tex plate distribution in early stage of invasion induced rapid population growth in south area of the island.

(Areas for improvement) For future emergency action, it will be necessary to get more information about the host plant distribution and fruiting season in the local area. Earlier communication with local residents will be necessary for raising awareness and understanding of the eradication program such as chemical spray and fruit stripping.

(Future plans and activities) MAFF and local governments continuously conduct detection survey for early detection both at air/sea ports and fruit production areas in Japan



Fruit fly trap installation by MAFF



Takakura: Rice storage house in Amami (1955)