

Field Evaluation of Ten Attractants of Tephritid Fruit Flies in Citrus Groves of China

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Introduction

Recent trade negotiations between the U.S. and Chinese governments suggest that Chinese fresh citrus will likely gain U.S. market access in the near future. The Pest Risk Assessment (PRA) of importation of Chinese fresh citrus to the continental U.S., which was conducted by United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), indicated substantial risk of fruit fly invasion associated with the trade. To facilitate the trade and safeguard U.S. agriculture, this USDA-APHIS funded project commenced in 2014. The primary goal of the study was to evaluate the efficacy of different lures for exotic Chinese tephritid fruit fly species, especially *Bactrocera minax* and *B. tsuneonis*, two economically important species (Fig 1)



Fig 1. left: *B. minax* on sticky ball, right: *B. dorsalis* in Steiner trap with ME

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Methods

- A total of ten lure/trap combinations were evaluated in four citrus groves across China's citrus production region (Fig 2)
- Five replicates per lure. These lure and trap combinations included four synthetic male lures in Steiner traps, five food-based lures in McPhail traps, and one green sphere sticky ball (Fig 3)

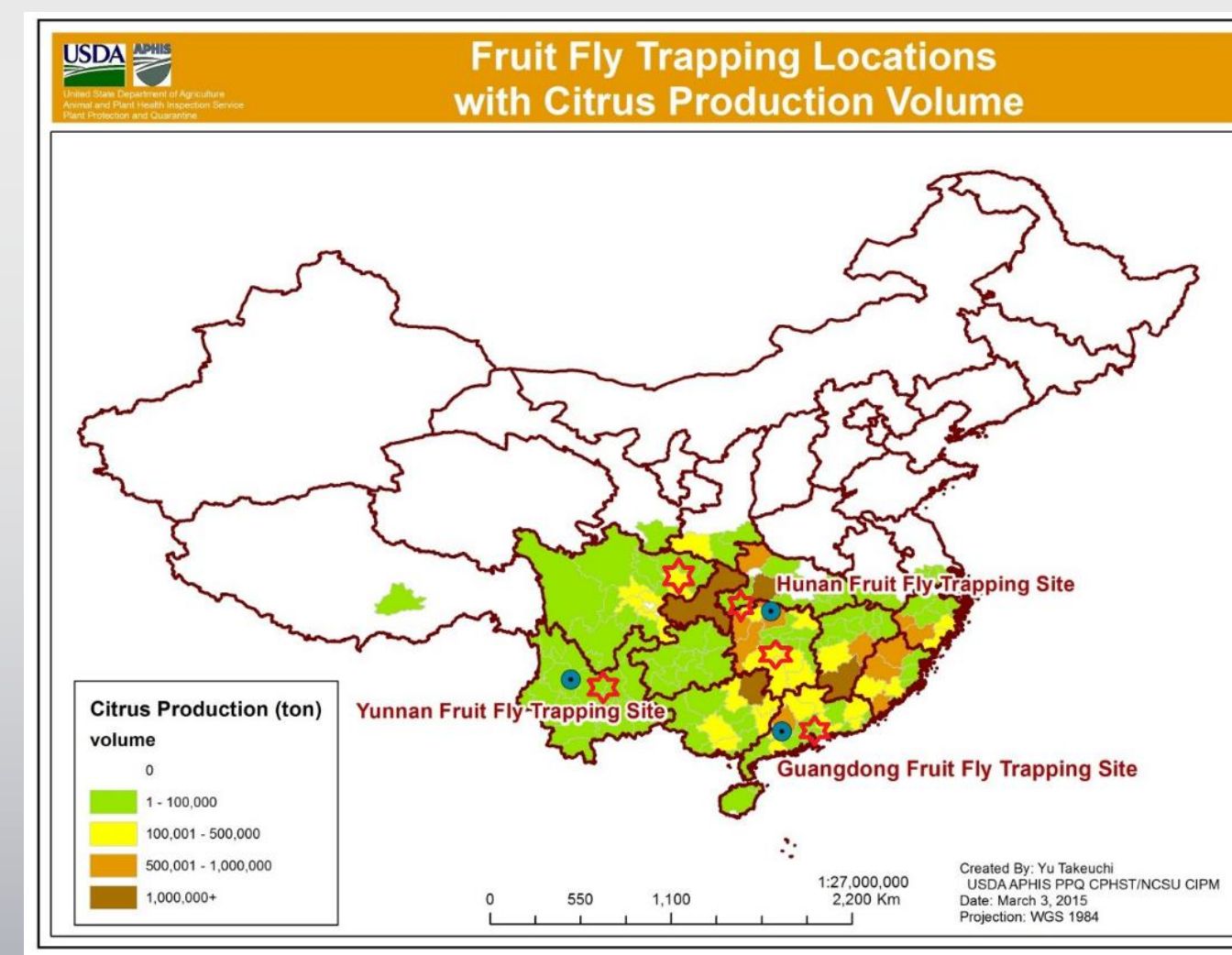


Fig 2. Trapping sites in China

Lure(Acronym)	Target FF	Trap
Trimedlure (TML)	<i>Ceratitis</i>	Steiner
Methyl Eugenol (ME)	<i>Bactrocera</i>	Steiner
Cuelure (CUE)	<i>Bactrocera</i>	Steiner
Wet Torula yeast (Yeast)	Tephritidae	McPhail
Ammonium acetate (AA) + pultrescine (P) (2C)	<i>Bactrocera</i>	Steiner
AA +P +tri-methylamine (3C)	<i>Bactrocera</i>	Steiner
ME-China (MEC)	<i>Bactrocera</i>	Steiner
Great® Hydrolyzed protein (GHP)	Tephritidae	McPhail
Sugar-Vinegar Solution (Vinegar)	Tephritidae	McPhail
Green color sphere sticky ball (Sticky ball)	Tephritidae	N/A

Fig 3. Lures and traps

Results & Discussions

A total of 16 fruit fly species were trapped, not including the unidentified species. Methyl eugenol (ME) and cuelure (CUE), did not attract *B. minax* and *B. tsuneonis*. Five lure/trap combinations, i.e. torula yeast, hydrolyzed protein, ammonium acetate (AA) + putrescine (P), AA + P + tri-methylamine, and a green spherical sticky ball attracted *B. minax*. However, these lures do not appear to be effective enough for use in early detection, judging based on the number of flies trapped by these lures/device (Fig 4). More effective lures need to be developed against these two economically important species. Trapping data also revealed potential distribution areas of several economically important fruit flies in China.

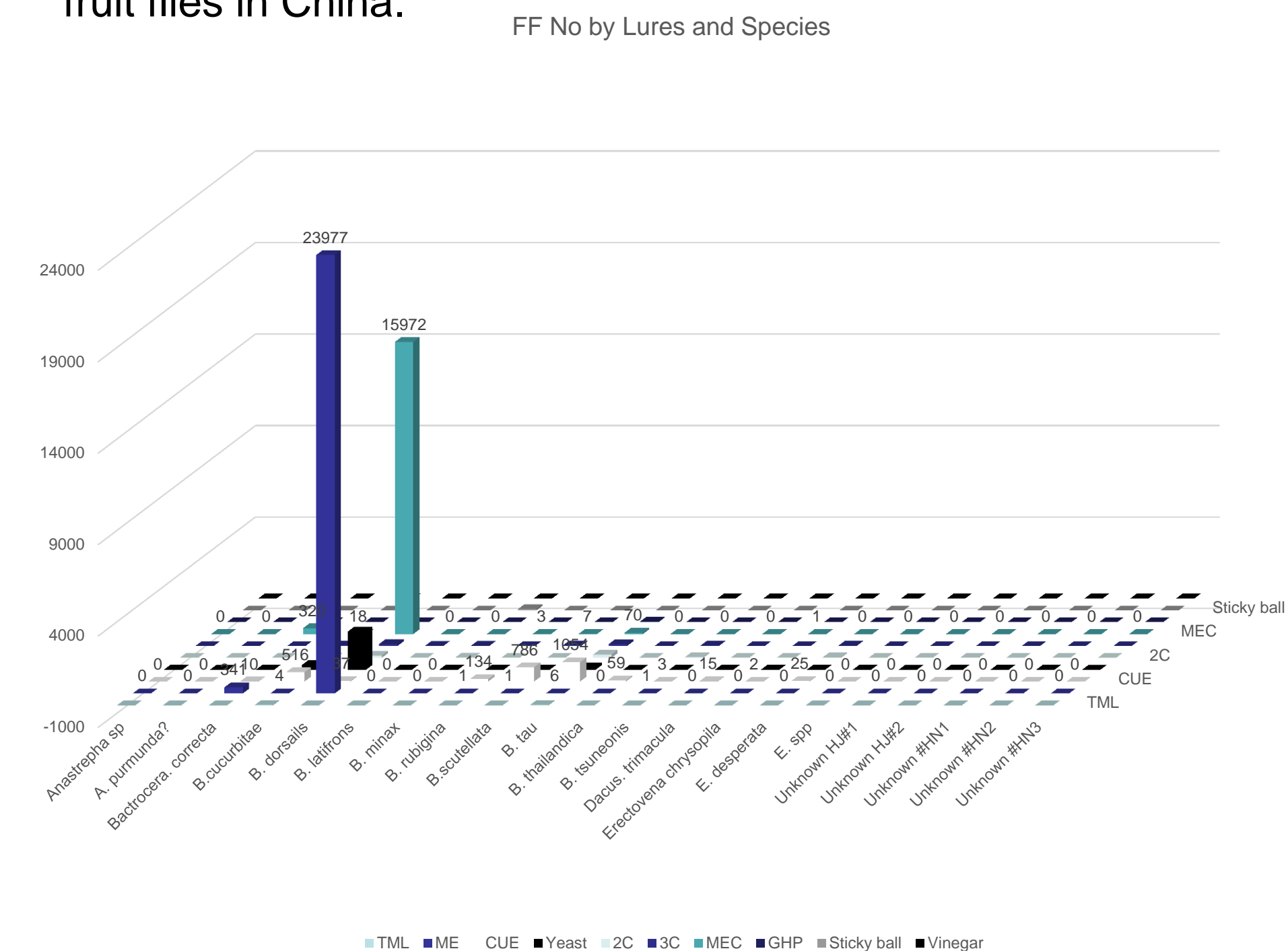


Fig. 4 trapping result: species vs. lure

References

Available upon request