Fumigation with phosphine for postharvest insect control on lettuce and broccoli

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Western flower thrips, *Frankliniella occidentalis* (Pergande) (Thysanoptera: Thripidae), is a common insect on lettuce and broccoli in the U.S. but is quarantined in Taiwan. Both lettuce aphid, *Nasonovia ribisnigri* (Moseley) (Homoptera: Aphididae), and leafminer, *Liriomyza langei* Frick (Diptera: Agromyzidae), are major pests on lettuce in the U.S. and are quarantined in Japan. Pure phosphine fumigation at low temperatures was studied as an alternative to methyl bromide fumigation for postharvest insect control on lettuce and broccoli.

Phosphine at different concentrations was tested against nymphs and adults of western flower thrips and lettuce aphid and pupae and flies of the leafminer at 2°C for different durations in glass jars. Western flower thrips was most susceptible to phosphine fumigation treatments and lettuce aphid was most tolerant to phosphine fumigation treatments. For control of lettuce aphid, three day fumigation at >2000 ppm phosphine is needed.

One day fumigation treatment with about 1000 ppm phosphine at 2°C was also tested on head and romaine lettuce and on broccoli in 20 gallon metal drums for control of western flower thrips. The treatment was safe to both head lettuce and romaine lettuce and to broccoli.