Mustard Seed Meal for Weed Control in Chile Pepper

Mustard seed meal — What is it?

- Byproduct from oil and bio-fuel production
- Rich in *glucosinolates*
- Soil amendment that increases essential plant nutrients
- Soil amendment that reduces weed and disease pressure by killing weed seedlings and disease propagules
- Certified by Organic Materials Review Institute (OMRI)

Mustard seed meal (MSM) — How does it suppress pests?

- MSM amendments require irrigation to suppress weeds and disease
- Wetting MSM initiates enzymatic hydrolysis of *glucosinolates*. This breakdown of glucosinolates produces *isothiocyanates*
- *Isothiocyanates* are volatile compounds that inhibit growth of weeds and disease-causing organisms in soil

Mustard seed meal (MSM) — Can it improve weed control programs in chile pepper? (Our trials)

Pre-plant incorporated applications of MSM

- Approximately one month prior to chile seeding, MSM was applied at the following three rates: (1) 3925 lb acre^{-1}, (2) 1963 lb acre^{-1}, and (3) 0 lb acre^{-1}
- Immediately following application of MSM, seedbeds were listed (**Figure 1a**). Field was then furrow-irrigated.
- Chile was seeded without pre-emergent herbicides or fungicides.

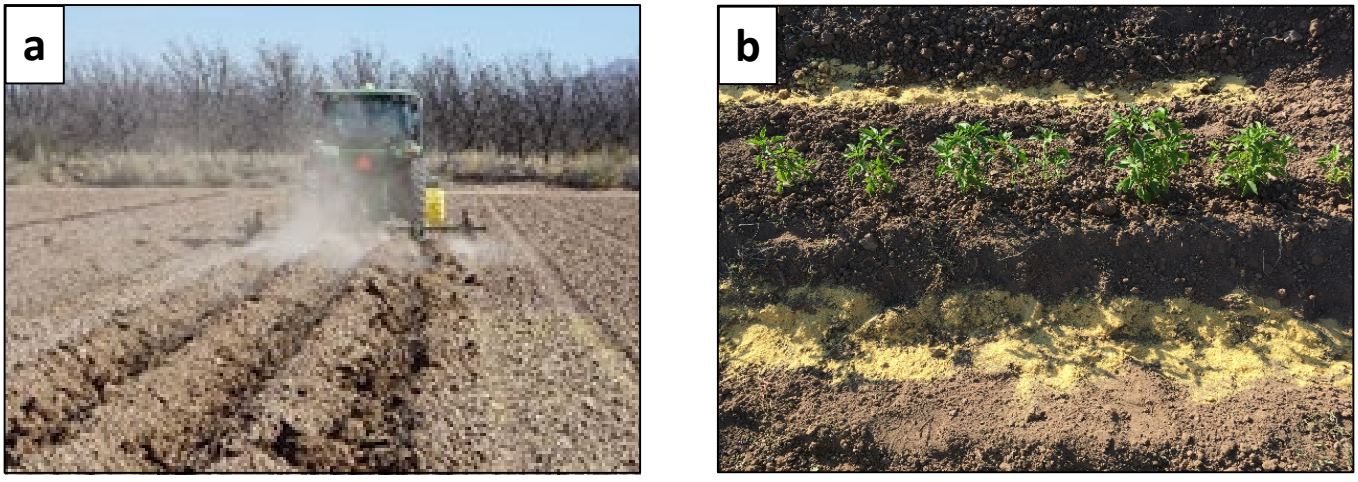
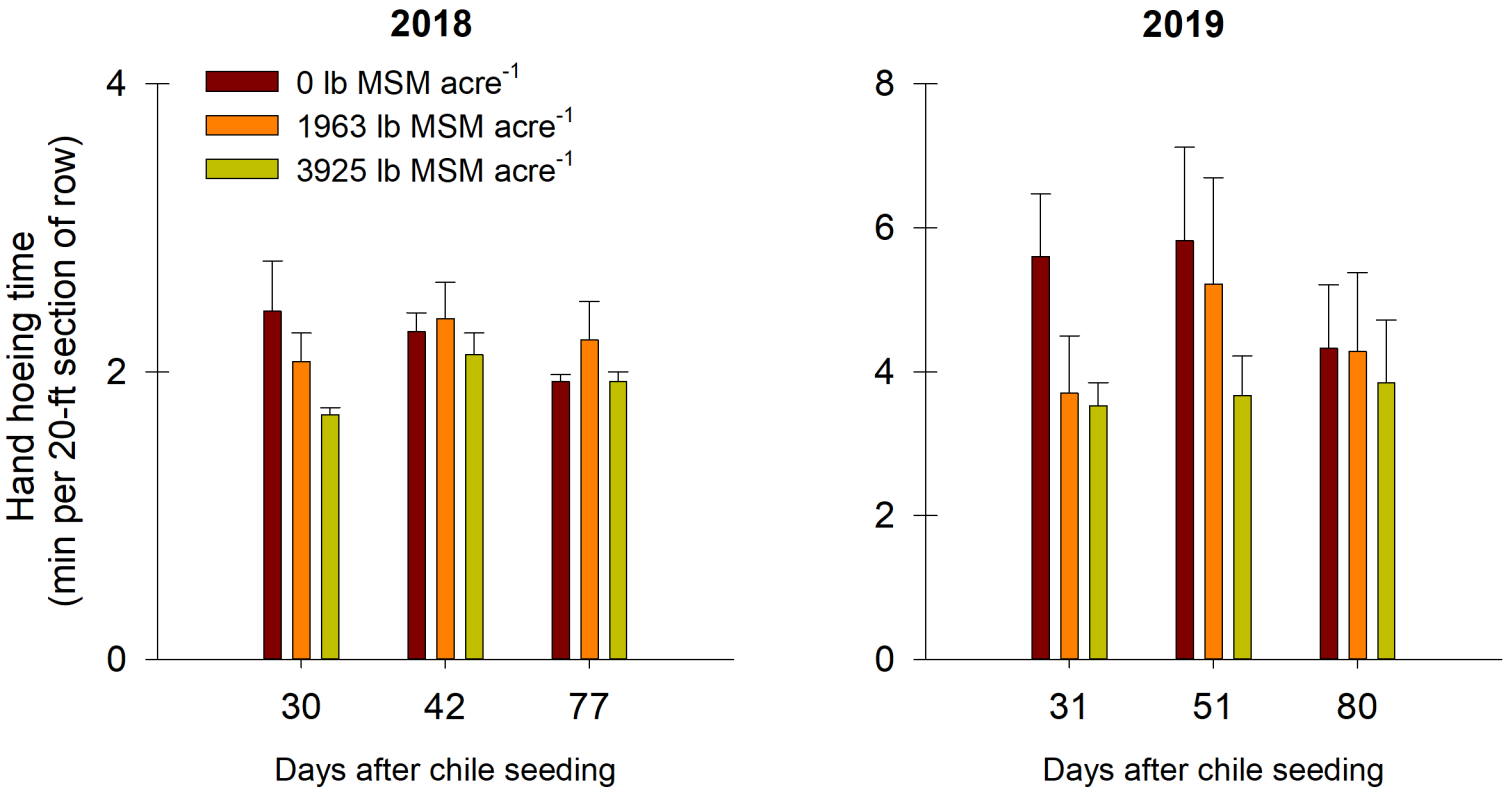


Figure 1. (**a**) Pre-plant applications of MSM incorporated during listing of chile rows. (**b**) Post-emergence applications of MSM directed to furrows.

PRE-PLANT INCORPORATED APPLICATIONS OF MSM

- MSM reduced hoe times during the early phases of the 2018 and 2019 chile growing seasons (*Figure below*). These reductions in hoe time coincided with fewer weeds in MSM plots.



POST-EMERGENCE APPLICATIONS OF MSM

- Approximately one month after chile stand thinning, MSM was applied in bands (**Figure 1b**) and incorporated with rototiller
- Treatments: (1) 3925 lb acre^{-1}, (2) 1963 lb acre^{-1} and (3) 0 lb acre^{-1}
- Treatments intended to target weeds emerging with monsoon rain. **If not controlled, these weeds reduce yield, interfere with harvest, and produce seeds that persist in soil!**
- Results: *Stay tuned…*

TAKE HOME MESSAGES

- MSM amendments are organically certified techniques for reducing hand hoeing requirements in chile production.
- To realize the full benefits of MSM (disease suppression, enhanced fertility, weed control), we are conducting further research on MSM in the context of New Mexico chile production.

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