

NON-CHEMICAL APPLE THINNING



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When to thin?

- Pome fruit at $\frac{1}{2}$ to 1 "at 30-45 days of full bloom
- Thinning within 4 weeks of full bloom helps regular bearing
- Apples and pears-6 to 8 inches apart (one fruit per fruiting spur)

Survival of apple industries

- Better suitable varieties
- Rootstocks
- Planting distance
- Orchard management systems
- Thinning apple

Why thin?

- Increase size and quality of fruit
- Reduce limb breakage.
- Help maintain tree vigor
- Insect and disease management
- Promote regular flowering and bearing
- Reduce labor cost at harvest

Survival of apple industries need

- Better suitable varieties
- Rootstocks
- Planting distance
- Orchard management systems
 - * Organic vs conventional
 - * Pest management
 - * Thinning apple

Carbaryl or Sevin

- At 0.25 to 1 qt XLR/100 gal water.
- Absorbed more readily
- May improve the penetration of other chemicals
- Potential risk to honey bee
- Do not use below 70 ° F, use in maximum day length time

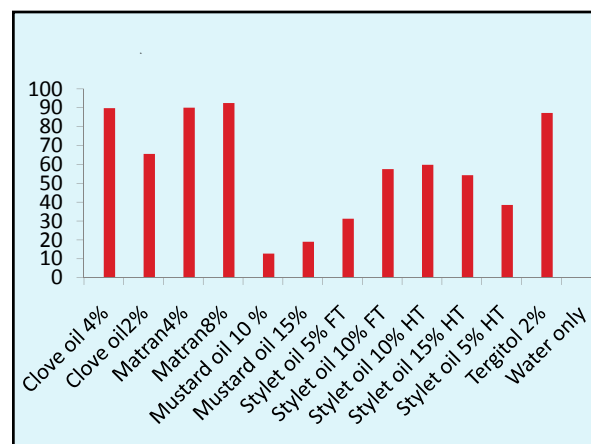
- **NAA (Naphthalene acetic acid)**
- At 2.5 and 20 ppm
- More active than Sevin,
- **Chance of over thinning, especially at temperatures (85° or >) after application**
- **Fruit size may be reduced when applied late or at high-concentration or at temperature**
- **Normal thinning time may also result in small fruit size**

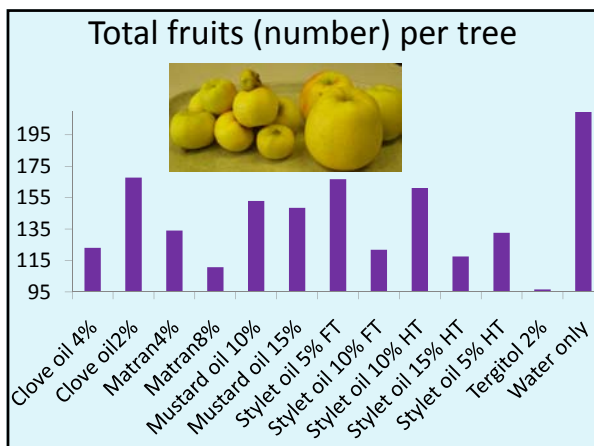
- ### Non-Chemicals
- 2 and 4 % Lime sulfur and/or fish oil applications gave best results
 - But the results were inconsistent over time and place
 - Fish oil gives unpleasant odor to the applicator or worker

- ### NAD (Naphthalene acetamide) less active than NAA.
- At 25 to 50 ppm
 - Used as a petal-fall spray
 - **NAD never use on Delicious, since small seedless fruit (pygmies) will result and persist to harvest**
 - **Not very effective**

- ### Treatments
- #### On Honey Crisp at full bloom
- Clove oil 4%
 - Matran 4%
 - Mustard oil 10%
 - Stylet oil 5% FT
 - Stylet oil 10% HT
 - Stylet oil 5% HT
 - Water only
 - Clove oil 2%
 - Matran 8%
 - Mustard oil 15%
 - Stylet oil 10% FT
 - Stylet oil 15% HT
 - Tergitol 2%

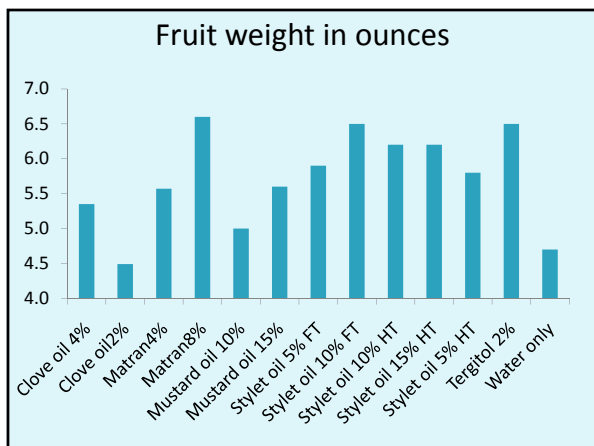
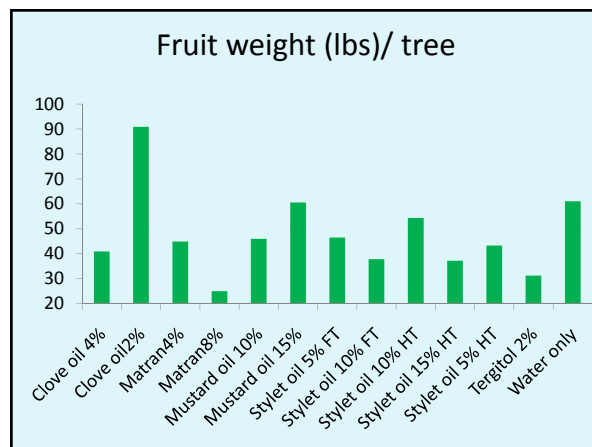
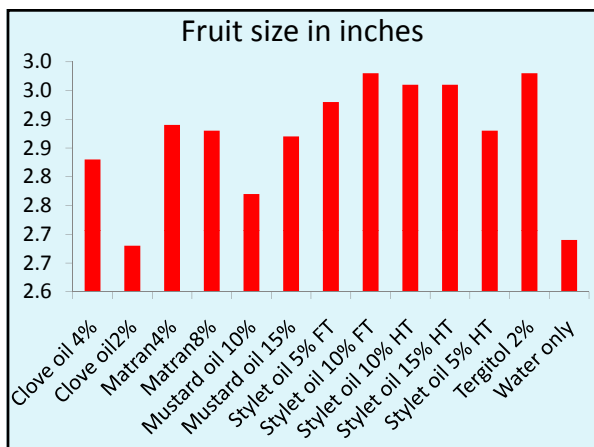
- ### Accel® newest chemical thinner
- Altered formulation of Promalin®.
 - Benzyladenine (same as promalin) + gibberellin A4+7 (about 10% of Promalin®).
 - Maximum concentration depends upon tree size and dilute gallonage requirement to cover the trees.
 - Generally, effective thinning
 - Avoid combining Accel® and NAA, since pygmies may result, especially on Delicious and Fuji.
 - Accel® thins best and increases size most when the application coincides with active cell division.
 - **Applying Accel® the first time that weather report predicts 3 days with temperatures in the high 70's or low 80's after fruit size reaches 5 mm.**
 - **Do not apply Accel® when fruit size exceeds 15 mm.**





Full tree vs half tree

Treatments	East	East	West	West
	Number of fruits	Weight in Lbs	Number of fruits	Weight in Lbs
Stylet oil 5% FT	83.6	24.1	83.2	22.3
Stylet oil 5% HT	71.3	23.9	61.3	19.4
Stylet oil 10% FT	71.0	21.8	51.0	16.1
Stylet oil 10% HT	91.5	29.5	69.7	24.8
Water only	117.8	32.2	91.8	28.8



Conclusion

- Oils products may be used for apple thinning, and they may be economical
- Both conventional and organic producers can use these oils
- This work will be continued in near future

Thank you

