Universidade de São Paulo
“Escola Superior de Agricultura Luiz de Queiroz “

Controle Químico de Doenças de Plantas - LFT5860

CALDA SULFOCALCICA, CALCIUM POLYSULFIDE, LIME-SULFUR OU GRISON LIQUID

Arnaldo Esquivel Fariña

CALDA SULFOCALCICA - HISTORIA

Table 2. Fungicides in use up until 1940 [after Russell 2005 (15)]		
Year	**Fungicide**	**Primary Use**
1637	Brine	Cereal seed treatment
1755	Arsenic	Cereal seed treatment
1760	Copper sulfate	Cereal seed treatment
1824	Sulfur (dust)	Powdery mildew and other pathogens
1833	Lime sulfur	Broad spectrum foliar pathogens
1885	Bordeaux mixture	Broad spectrum foliar pathogens
1891	Mercury chloride	Turf fungicide
1900	$CuOCl_2$	Especially *Phytophthora infestans*
1914	Phenylmercury chloride	Cereal seed treatment
1932	Cu_2O	Seed and broad spectrum foliar diseases
1934	Dithiocarbamates patented	Broad spectrum protectants
1940	Chloranil, Dichlone	Broad spectrum seed treatment

Morton & Staub (2008)

CALDA SULFOCALCICA - HISTORIA

C. Rediscovery of Sulfur

Although sulfur had been known as a pesticide in the time of the ancient Greeks, no mention of it as a fungicide appeared again until the

Torgeson,(1967)

- **Weighton – 1814**
- **Roberston – 1821**
- **Kenrick – 1833**
- **Grison - 1851**

Versailles, France, in 1851.

Grison liquid (*Eau Grison*). — Prepared by boiling 3 pounds each of flowers of sulphur and lime in 6 gallons of water until reduced to 2 gallons. When settled, pour off the clear liquid and bottle it. When used, mix 1 pint of clear liquid in 100 parts of water. For European mildew and powdery mildew of vines.

https://www.youtube.com/watch?v=tV9ZBj78ZlQ&t=232s

CALDA SULFOCALCICA - LIME-SULFUR - GRISON LIQUID

Complexos inorgânicos de catiões de cálcio divalentes (Ca2 +) e cadeias de polissulfureto aniónico que variam em comprimento de dois a sete átomos de enxofre

(pH = 11.5–11.8)

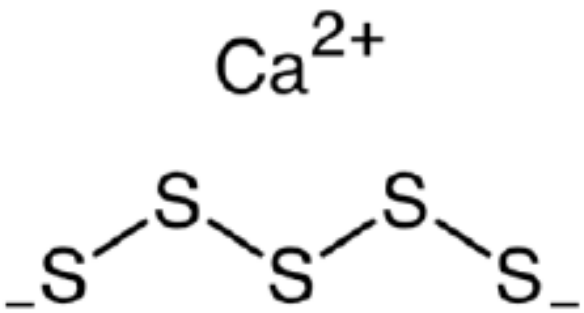

Figure 1. Molecular formula for calcium pentasulfide.

calcium thiosulfate (CaS_2O_3), calcium sulfite ($CaSO_3$), sulfur, hydrogen sulfide (H_2S) ,and gypsum ($CaSO_4$)

The fungicidal, insecticidal and acaricidal properties of lime sulfur

- **Impaired electron transport**

  Sulfur affects the mitochondrial respiratory complex by interfering with the electron flux in the respiratory chain, resulting in multi-site, broad-spectrum toxicity.

- **Hydrogen sulfide (H_2S) (toxic to most cellular proteins)**

  Responsible for the toxicity in insects and mites

Lime and the Control of Clubroot of Crucifers: Effects of pH, Calcium, Magnesium, and Their Interactions

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Potencial de defensivos alternativos para o controle do ácaro-branco em pimenta "Malagueta"

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Control of postharvest decay of citrus fruit with calcium polysulfide

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