INDUSTRIAL HEMP IPM

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Another pest that is highly difficult to manage is the **hemp russet mite**. Once physical symptoms of hemp russet mite feeding injury are observed, a heavy population density already exists. Mite presence can only be documented via the use of high-power microscopy (15x magnification or greater). Hemp russet mite is a greater problem in indoor growing environments since it is near impossible to eradicate once populations have established.

In November 2019, we evaluated several natural and conventional miticides (Table 1) in order to control hemp russet mite populations on CBD-hemp plants in an indoor growing facility. Russet mite infested plants in 1-gallon pots were spaced apart in an isolated room where they could be individually treated.

Four replicates of each of 11 treatments were tested. All miticide treatments were evaluated at label suggested rates (Table 2) and were applied twice (6 and 8 November) by spraying until runoff with a handpump sprayer applying a fine mist of product to all plant surfaces. At several post spray sample dates, 10 hemp leaves were collected per plant and a mite brushing machine was used to assess mite populations under magnification.

Table 1. Miticide treatments that were evaluated on hemp russet mite in Virginia.

Product (manufacturer)	Active ingredient
Grandevo (Marrone Bioinnovations)	30% *Chromobacterium subtsugae* strain PRAA4-11 and spent fermentation media
Venerate (Marrone Bioinnovations)	94.5% Heat-killed *Burkholderia* spp. strain A396 cells and spent fermentation media
Sulfur (Bonide)	90% Sulfur
Requiem EC (Bayer Crop Science)	16.8% Plant extract of *Chenopodium ambrosioides*
M-Pede (Gowan Corp.)	49% Potassium salts of fatty acids
PLP (PLP Natural Products, Inc.)	Mix of natural oils, citronella 3.2%, lemongrass 3.8%, peppermint 3.2%, cinnamon 3.7%, and garlic 3.8%
Mammoth (Mammoth Products)	Thyme oil
Agrimek SC (Syngenta Crop Protection)	8% abamectin
Movento (Bayer Crop Science)	22.4% spirotetramat
SuffOil-X (Arbico Organics)	highly refined, pre-emulsified mineral oil

Results. There was no significant treatment effect on counts of russet mites at 6 DAT or 10 DAT (Table 2), but by 25 DAT (Dec 3), there was a significant treatment effect with the untreated control and Grandevo treatments having the most mites, and several of the treatments having significantly fewer mites than the untreated control including: PLP Liquid Formula, Mammoth, Agrimek, Movento, SuffOil-X, Venerate, Sulfur, and Requiem EC.

Table 2. Hemp russet mite densities on excised hemp leaves from indoor CBD hemp plants treated twice with various natural and synthetic miticides at maximum labeled rates, Hillsville, VA, 2019 †

		HEMP RUSSET MITES PER 1 CM^2 AT 3 SAMPLE DATES POST SPRAYING		
Treatment*	**Rate per gallon**	**14 Nov (6 DAT)**	**18 Nov (10 DAT)**	**3 Dec (25 DAT)**
Untreated control		120.5	39.3	57.5 ab
Grandevo	0.48 oz	57.8	24.8	65.5 a
Venerate	0.96 fl oz	55.8	36.8	26.5 cd
Sulfur	3 tbsp	58.3	25.5	12.5 cd
Requiem EC	0.96 fl oz	73.5	18.3	15.0 cd
M-Pede	0.315 fl oz	72.5	33.5	37.5 bc
PLP Natural	3.2 fl oz	33.8	6.5	10.5 d
Mammoth	3 fl oz	47.0	21.3	6.8 d
Agrimek	0.0425 fl oz	53.8	8.5	8.5 d
Movento	0.09 fl oz	74.3	15.0	5.8 d
SuffOil-X	2.56 fl oz	93.0	13.8	8.0 d
P-vaue		NS	NS	0.001

*Treatments were applied on two dates, 6 and 8 November, 2019

†Ten hemp leaves were collected per plot and a mite brushing machine was used to assess mite populations under magnification.