



MANAGING BLACK ROT & BLACK SPOT ON CRUCIFERS

Black Rot and Alternaria Leaf Spot are the most serious and common diseases in broccoli, cabbage, cauliflower, kale, and Brussels sprouts. Damage caused by these two diseases often results in significant economic losses to growers. Black Rot, (Bacterial Blight), is a bacterial disease caused by *Xanthomonas spp.* Alternaria Leaf Spot is a fungal disease caused by *Alternaria spp.* Both diseases are manageable and somewhat preventable if appropriate proactive measures are taken.

Black Rot often results in black curds on cauliflower and blackened florets on broccoli making heads unmarketable. This disease thrives in typical autumn conditions as it can survive at cool temperatures, then explodes when light rain is followed by heat. Therefore, it is especially important to maintain a preventative program, even when symptoms are not immediately present. The Black Rot pathogen is introduced to fields on contaminated seeds, infected seedlings, and can also be vectored by wind, rain, and insects. The earliest symptom observed is often 'V' shaped, yellow lesions-originating at leaf margins which often take on a brown coloration as the disease develops.

PRACTICES TO PREVENT BLACK ROT:

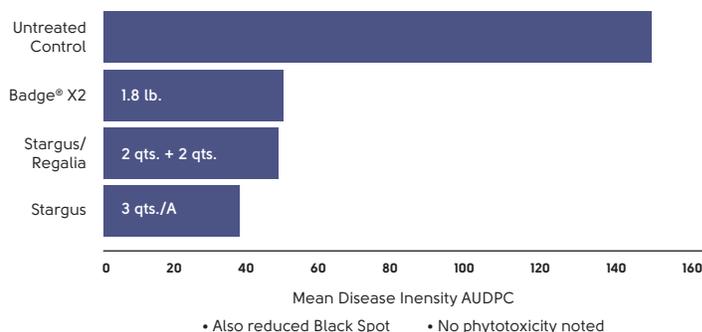
- Use resistant varieties when available.
- Use only hot water treated seed. There are excellent directions for hot water treating seed in the Ohio State University publication entitled "Hot Water Seed Treatment". According to this publication both temperature and duration are critical aspects of hot water treatments for seed: with too short of a time or too cool temperatures, the disease can persist, and extended times and high temperatures run the risk of seed embryo mortality. Brassica seed coats are notorious for coming off during hot water treatment, so be ready to plant the seeds immediately. To reduce the risk of these variables, many growers opt to purchase commercially pretreated seed.
- 3 year crop rotations are recommended to make sure that no crop residue from the last Brassica crop persists.
- Destroy all crop debris as soon after harvest as possible. Flail and incorporate the debris.
- Follow the pesticide application program below:
Apply Stargus® Biofungicide at 3 qts./A + spreader-sticker rotated with Regalia® Biofungicide at 2 qts./A + copper (see your product label for rates) + spreader-sticker. Examples of spreader-stickers include: Attach®, Cohere®, Liberate®, Nu-Film-P® (OMRI-listed), Nu-Film-17®, and Surfix®-P.

Under dry conditions, application intervals can be lengthened to 10 days; however, in wet conditions, shorter intervals may be necessary for good control. Early applications when the plants are young may be best done with a backpack spray rig in smaller fields. Consult Marrone Bio Innovations 'small tank' sheet or your Marrone technical representative for per gallon rates. The program noted above uses all OMRI-approved materials, conventional growers may want to include mancozeb in their Regalia® Biofungicide + copper tank mix for improved results.

This program has proven highly effective in managing Black Rot and Black Spot. Below are results from a research trial conducted at Cornell University during the very wet 2018 growing season.

MBI FUNGICIDES REDUCE BLACK ROT IN BRUSSELS SPROUTS

Dr. Chris Smart, Cornell University – 2018



While Black Spot is a fungal disease, it is often seen under similar environmental conditions as Black Rot, and also predominates Brassicas grown in the fall. It too persists on crop debris, comes onto farms in infested seed and seedlings, and is spread by wind, rain, and insects. Alternaria infection begins as pin-sized black flecks on stems and leaves that enlarge and coalesce to form larger lesions with yellow halos. Including chlorothalonil and azoxystrobin pesticides (not OMRI-listed materials) in the proactive program noted above can provide additional Alternaria management. Note that significant levels of azoxystrobin-resistant Alternaria have been noted in certain areas. Check your state or regional pest management recommendation guides for additional information related to specific pesticides that are applicable to your crop and disease.