Vegetable Crop Updates

A newsletter for commercial potato and vegetable growers prepared by University of Wisconsin-Madison vegetable research and extension specialists

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Important Update on Blocker Fungicide in Potato

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The situation: In mid-December 2025, AMVAC Chemical Corporation, the manufacturers of the fungicide Blocker (pentachloronitrobenzene, PCNB), decided to stop producing Blocker 4F and 10G. In effect, this concludes production of Blocker for the future. The Blocker that is on the shelves at this time is all that will be available for future use. It is estimated that this will leave potato growers with a supply that may satisfy only 25-33% of the potato use demand in 2026.

Potato growers in Wisconsin have relied upon Blocker for strong common scab and Rhizoctonia control and will face challenges in the 2026 growing season in planning for disease management. Additional vegetable crop production uses of Blocker include crucifer (cabbage, broccoli) Rhizoctonia and Clubroot management.

While the US Environmental Protection Agency has, for several years, proposed canceling registrations of Blocker due to ecological and human health risk concerns, this stopping of manufacturing of Blocker was a decision of AMVAC. There is no change to the registration of Blocker at this time, but access to this fungicide will be extremely limited in 2026 and non-existent beyond this year.

What is Blocker?: Blocker provides multi-site interference with fungal metabolism and has protectant activity. The fungicide is a non-systemic, broad biocidal soil treatment and has minimal vapor action. Blocker's target pathogens are: **true fungi** including *Rhizoctonia solani* (stem canker, black scurf, wirestem), *Sclerotinia sclerotiorum** (white mold), and *Colletotrichum coccodes** (black dot); a filamentous ***bacterium*** *Streptomyces scabies* and other Streptomyces species (common scab), and a **plasmodiophorid** *Plasmodiophora brassicae* (club root). *Please note that the registration of Blocker 4F via chemigation (only) for potato white mold and black dot management is limited to Idaho, Nevada, Oregon, and Washington. AMVAC Chemical Corporation is the company that makes and registers Blocker products (Blocker 4F and Blocker 10G). AMVAC markets a suite of fungicides with PCNB under several brand names including Blocker, Terraclor, Turfcide, and Premion in the US. AMVAC will stop production of all these products.

For vegetable crop disease management, two formulations of AMVAC's Blocker (4F and 10G) are registered. The differences are in formulation, not chemistry. The 10G granular formulation treats a broader soil zone and has higher bulk. The 4F flowable formulation provides precision in placement with lower carrier volume. The table below summarizes Blocker 10G and 4F.

Summary of Blocker 10G and 4F formulations				
Blocker PCNB (FRAC 14) *detailed for Wisconsin*	**Blocker 10G**		**Blocker 4F**	
Formulation	Granular 10% PCNB	1 lb product = 0.10 lb a.i.	Flowable/liquid 40% PCNB 4 lb PCNB per US gallons	1 pt = 0.125 gal, 0.5 lb a.i.
Crops and rates on labels	Potatoes	**Stem canker/Black scurf *Rhizoctonia solani*** 1.65 lbs. per 1,000 linear feet of row	Potatoes	**Stem canker/Black scurf *Rhizoctonia solani*** 5-10 pt/acre in banded application **Common scab *Streptomyces scabies*** in 2ee registration 5-10 pt/acre in banded application
	Cole crops	**Clubroot *Plasmodiophora brassicae*** 3 pt/acre 5.62 gal/acre broadcast rate 55 fl oz/1000 linear feet or row ***Rhizoctonia solani* wirestem/bottom rot on cauliflower etc.** 2.8 to 3.75 gal/acre broadcast drench in 50 gal of water/acre	Cole crops vegetable seedlings	**Clubroot *Plasmodiophora brassicae*** 3 pt/acre Transplant Solution: 3 pt/100 gals of water 5.62 gal/acre 55 fl oz/1000 linear row feet Band Application: Apply in 25 gals of water per acre or 5.5 fl. oz. per 100 ft. of row based on 40 inch row spacing. Spray as a 12- inch band

		1.9 to 2.8 gal/acre row drench treatment, apply in 35 gal water per acre *Pre-plant banding:* 5.15 lbs. per 1,000 linear feet of row *Broadcast treatment*: 225 lbs. per acre *Cauliflower Wirestem pre-plant banding*: 3.4 lbs. per 1,000 linear feet of row	centered on row and incorporate to a depth of 4-6 in prior to planting. **Wirestem, bottom rot *Rhizoctonia solani*** 2.8-3.75 gal/acre Broadcast Drench Application: Apply in 50 gal/water/acre as a soil drench at seeding. Do not exceed 22.5 lbs. of A.I. /A in any one season 1.9-2.8 gal/acre 18-27 fl oz/1000 feet of row Row Drench Treatments: Apply in 35 gal/water/acre based on 40-inch row spacing. Spray as an 8-inch band centered on the row at seeding.

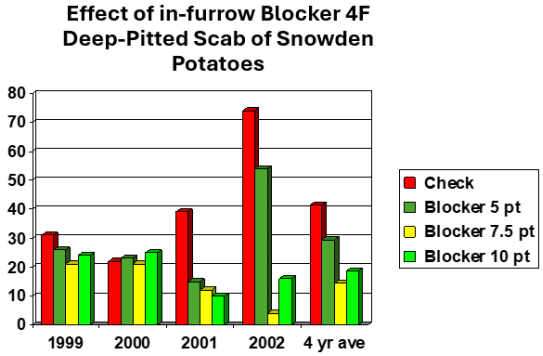
Alternatives to Blocker for potato Rhizoctonia control: Rhizoctonia control requires an integrated preventative approach including varietal tolerance, clean seed, avoiding planting into cold (ideally >45°F) and wet soils, allowing suberization time and conditions (50-55°F with good airflow) for cut seed, immediately treating cut seed with fungicides, and using in-furrow fungicides. The seed-applied and in-furrow fungicides for use on Rhizoctonia include mancozeb (FRAC M3); benzovindiflupyr, flutolanil, fluxapyroxad, penthiopyrad and pydiflumetofen (FRAC 7), azoxystrobin, pyraclostrobin, and trifloxystrobin (FRAC 11), and fludioxonil (FRAC 12). Seed treatments and in-furrow treatments protect stems and stolons early, but do not eradicate soil inoculum. Encourage quick shoot emergence by choosing optimum planting times, conditions, and planting depth. Rotate away from potatoes for 3-4 years and avoid rotations with other susceptible crops including beets and beans; small grains and corn are best rotations to help reduce Rhizoctonia soilborne inoculum.

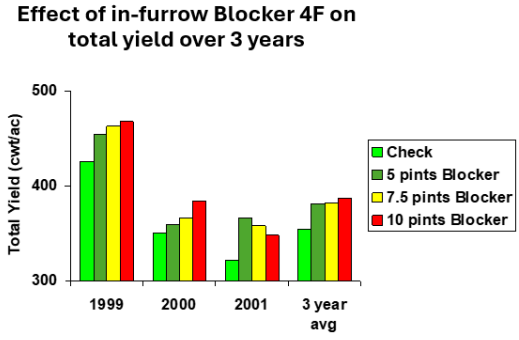
Alternatives to Blocker for potato Common Scab control: Potato common scab requires an integrated and preventative approach for management. Elements of management include use of tolerant or resistant varieties, maintenance of consistent soil moisture during tuber initiation (~3-4 weeks, avoid drying-rewetting cycles), management of soil pH to 5.0-5.2, crop rotation (3-4 years out of potatoes, beet, carrot, radish), use of seed with low or no common scab, avoidance of excess early nitrogen, maintenance of adequate calcium, and avoidance of over-application of manure before potatoes.

Chemical and biological inputs are generally variable in performance, but there are some with greater consistency in common scab management. At the end of this article, I summarize the results of our evaluations of fungicides, biologicals, insecticides, fumigants, and plant hormone inputs for the control of potato common scab in my program since 2009. Further, I've added, below, elements from other researchers with the goal of offering a comprehensive list of inputs in considering management strategies.

Fludioxonil (ie: Maxim) has demonstrated common scab control in past recent years. In our Wisconsin studies, our seed-applied fludioxonil treatments have not reduced common scab severity or incidence, but other locations have documented this outcome. When applied as a seed treatment in a Canadian study, fludioxonil reduced common scab incidence by 35%, and reduced common scab severity by 58%. The yield of marketable tubers increased by nearly 25% when compared to the non-treated control. The study, which also offers evaluation of other biological fungicides and fumigants, can be found here: https://www.tandfonline.com/doi/full/10.1080/09583157.2015.1079809 As with all aspects of common scab management, effectiveness of any one parameter can vary by location. (The citation of this paper is: Al-Mughrabi, Vikram, Poirier, Jayasuriya, Moreau. 2015. Management of common scab of potato in the field using biopesticides, fungicides, soil additives, or soil fumigants. Biocontrol Science and Technology. Vol. 26(1):1-23).

Ralph Frederick of AMVAC has conducted field research on Blocker 4F rates for reducing common scab. In his work, he has found that the standard 10 pt rate of Blocker 4F can be reduced to 7.5 pt and result in effective common scab management and increased yield. His work showed that the 5.0 pt rate was less effective (Figure below). **In order to utilize the limited Blocker supply most efficiently, and across broadest acreage of susceptible potato crops in 2026 for common scab control, one option is to reduce the rate to 7.5 pt/acre.**





For further information or if you have any questions, please reach out to Ralph Frederick of AMVAC at RalphF@amvac.com or 218-340-1609 regarding Blocker or his rate work; or Amanda Gevens, UW-Plant Pathology at gevens@wisc.edu or 608-575-3029 regarding disease management in vegetables.

Treatments evaluated for potato common scab control ('Yukon Gold' potato grown in *Streptomyces scabies* disease nursery research plots), A.J. Gevens, University of Wisconsin-Madison				
Trade Name	**Active Ingredient**	**Time of Application**	**Years Tested**	**Comment on Efficacy**
Non-treated Control	NA	NA	15	Poor
Vapam	Metam sodium	Fall pre-plant fumigation	7	Poor/Variable
Pic Plus	Chloropicrin (85%)	Fall pre-plant fumigation	2	Good
Pic Plus + Serenade Soil	Chloropicrin (85%) + *Bacillus subtilis*	Fall pre-plant fumigation and in-furrow	2	Good
C60 Pic	Chloropicrin (60%)	Fall pre-plant fumigation	2	Good
C60 Pic + Regalia SSC	Chloropicrin (60%) + *Reynoutria sachalinensis* extract	Fall pre-plant fumigation	2	Good
Quadris Flowable 2F	azoxystrobin	In-furrow	9	Poor/Highly Variable
Quash 50WDG	Metconazole	In-furrow	1	Poor
Blocker 4F	Pentachloronitrobenzene (PCNB or Blocker)	In-furrow	9	Good
Blocker 4F + Mocap 15G	PCNB + ethoprop (15%)	In-furrow	2	Good
Mocap 15G	ethoprop (15%)	In-furrow	3	Good
Blocker 4F + Rejuvenate	PCNB + naphthalenic acid (NAA)	In-furrow	5	Good
Rejuvenate	naphthalenic acid (NAA)	In-furrow	3	Good/Highly Variable
Mocap 15G + NAA	ethoprop (15%) + NAA	In-furrow	2	Poor
Omega	fluazinam	In-furrow	3	Good
Nimitz	fluensulfone	In-furrow and with foliar applications	3	Good
Colonize	mycorrhizal inoculant	In-furrow	2	Poor
Colonize + Messenger	mycorrhizal inoculant + harpin protein	In-furrow	2	Poor
Agzyme	bio-stimulant and foliar nutrients	In-furrow	1	Poor
Serenade Soil	*Bacillus subtilis* strain 713	In-furrow	7	Poor/Variable
MycoApply	mycorrhizae	In-furrow	3	Poor

Regalia 5SC	*Reynoutria sachalinensis* extract	In-furrow	7	Poor
Tiger-Sul 90CR	Elemental sulfur	In-furrow	4	Poor
AmegA SC	Iron, phosphite, plant oils, and surfactant	In-furrow	1	Poor
Double Nickel	*Bacillus amyloliquefaciens*	In-furrow	7	Good/Variable
AmyProtec	*Bacillus amyloliquefaciens*	In-furrow	3	Good/Variable
EF-400 + Bac Stop	Blend of horticultural oils	In-furrow and with foliar applications	4	Good
Nobactra blend	Antagonistic bacteria + horticultural oils	Seed treatment and In-furrow	1	Good

Trial summaries can be found at my UW Vegetable Pathology website:
https://vegpath.plantpath.wisc.edu/field-trials/field-trial-archive/