

WHEAT STREAK MOSAIC VIRUS

FACTS & MANAGEMENT TIMELINE

Host Crops

Wheat streak mosaic (WSM) virus attacks barley, corn and some grasses (some forage, native or weedy species), but is most common on winter and spring wheat. Oats and rye may be infected but they do not appear to be seriously damaged. Wheat is the only cereal that is seriously affected.

Biology

Wheat streak mosaic is a viral disease of wheat. The disease cycle is dependent on living (green) plant material and a vector – the wheat curl mite. The virus enters the leaves and spreads to all parts of the plant. Infected plants are usually stunted and produce fewer seeds, which are often badly shrivelled. The earlier the infection, the greater the effect on the plant.

Wheat streak mosaic virus is transmitted by the wheat curl mite and by leaf rubbing. The mite can be blown from field to field by wind.

The mite and virus overwinter on winter wheat. In the spring, mites multiply rapidly and are blown to spring wheat or volunteer spring wheat. These hosts harbour the mite and virus over the summer. If winter wheat is sown near unharvested spring wheat, infected mites can be blown onto winter wheat completing the disease cycle.

Development of this disease depends on the population of mites, the presence of virus-infected wheat plants, and sufficient moisture for good plant growth and rapid mite reproduction. Severe outbreaks occur when there is a build-up of mites and virus on volunteer spring wheat in fields next to winter wheat that was planted early.

Symptoms of the disease become more pronounced when temperatures climb above 10 degrees C (50 degrees F) in the spring.

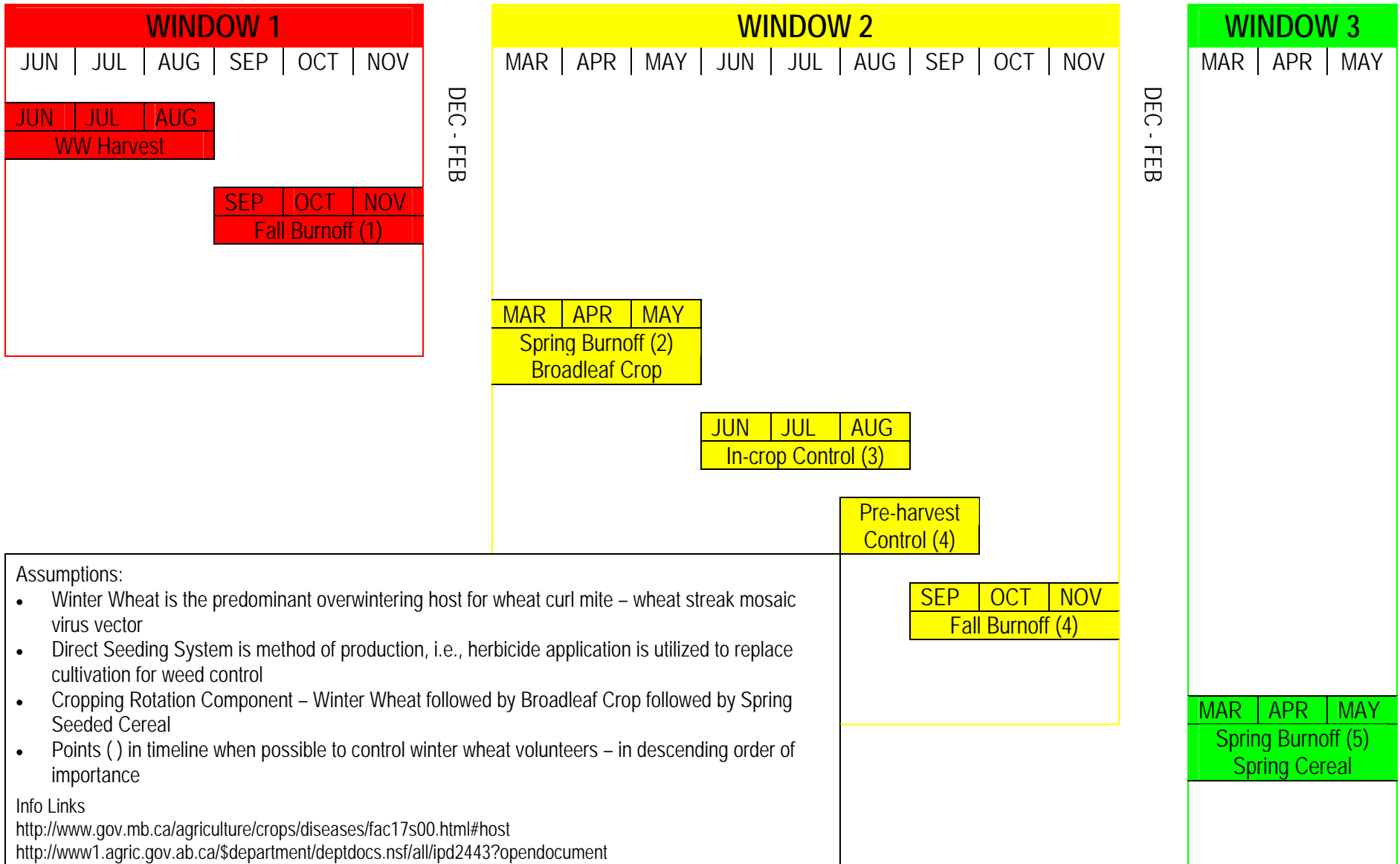
Symptoms of damage - Winter wheat rarely shows symptoms until spring. These symptoms appear on the leaves as dashes, streaks or yellow stripes parallel to the veins. Leaves become increasingly mottled until the green areas disappear and the leaves die. Infected plants are stunted; the degree of stunting depends on how early the infection took place. Wheat spot mosaic virus, which is similar to wheat streak mosaic virus, is spread by mites, has a comparable life cycle, and may sometimes be present in winter wheat.

Wheat infected at an early tillering stage stops growing and produces few to no heads. Infection at late tillering to early jointing stages results in head formation but the flowers may be sterile. With late season infection during jointing to boot stage, the flowers are fertile but kernels are reduced in size. Fall-infected winter wheat plants do not produce grain the following season. One study found that stunted and diseased plants yielded 78% less than healthy plants, and seed milling quality was reduced substantially.

Control of WSM virus is accomplished by preventing transmission through elimination of the so-called “green bridge.” The green bridge describes a situation where both a maturing spring crop and an emerging winter crop are close enough to allow the movement and survival of viruliferous mites. A 7 to 10 day break between the drydown of spring cereals and the emergence of winter wheat is necessary.



WSM MANAGEMENT TIMELINE



Assumptions:

- Winter Wheat is the predominant overwintering host for wheat curl mite – wheat streak mosaic virus vector
- Direct Seeding System is method of production, i.e., herbicide application is utilized to replace cultivation for weed control
- Cropping Rotation Component – Winter Wheat followed by Broadleaf Crop followed by Spring Seeded Cereal
- Points () in timeline when possible to control winter wheat volunteers – in descending order of importance

Info Links
<http://www.gov.mb.ca/agriculture/crops/diseases/fac17s00.html#host>
[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/ipd2443?opendocument](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/ipd2443?opendocument)
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