

## **Corn Downy Mildews**

The group reviewing the recovery plan for Corn Downy Mildews has proposed the following corrections and or changes to the plan:

### **Split the plan:**

There was a strong sense among the group that the plan should be split into two separate plans, with each plan focusing on a single disease. With the similarities and differences between these diseases, it is confusing to try to describe them both in one document. Separate plans also acknowledges the likely event that introduction of one would be independent of the other.

### **Introduction**

The Introduction needs some additional information to provide context to the report. For example:

- There are already three downy mildews of corn in the US. Are PDM and BSDM more damaging to corn than the native mildews? Are the native mildews a serious problem? If not, what is different about PDM and BSDM that causes people to think they would run rampant? Or are these diseases more of a trade concern (quarantine) than a disease concern? Not clear.
- The last epidemic of sorghum downy mildew was rapidly brought under control with fungicides.
- Can these mildews infect/survive on other plants or plant parts (e.g., seed) which serve as a probable source of inoculum?

### **Symptoms**

It is stated that indigenous mildews cause symptoms very similar to PDM and BSDM.

- If PDM and BSDM cause symptoms that are no different than existing downy mildews, then why are these diseases a concern? There needs to be some better background presented on these.
- If symptoms are so similar to native mildews, this will complicate the training of first detectors. Need to list the 1, 2, or 3 key symptoms to look for.

### **Biology and Spread**

- It is confusing to jump back and forth between PDM and BSDM because of the differences between them. It would be clearer if there were two separate plans with separated descriptions.
- Are the propagules really considered conidia, or are they zoospores?
- Drying seed to 14% is standard practice, so presumably is commercial standards are met, seed should be clean.
- Climatic conditions need better elaboration to identify areas of disease risk (e.g., irrigated corn, or corn grown in river or creek bottom might be at higher risk of BSDM)
- The differences in climatic conditions and epidemiology would be easier for a reader to follow if PDM and BSDM were partitioned into two separate documents.
- There is nothing here about possible pathways of introduction or the likelihood of arrival, spread and establishment.
- Is there anything about the biology that makes these diseases highly eradicable?

- Are these mildews on the list because they are really bad diseases where they occur? Are they costly to control where they now occur? If so, is it because of their cultural methods?
- What are the worldwide losses? (a managed problem in Asia)
- Risk and recovery depends on germplasm susceptibility. In the 1970s, CIMMYT screened a lot of germplasm and found reasonable levels of resistance in some lines. Was used in Taiwan, Indonesia. Adapted to Iowa and now in US germplasm. What is our risk?

COMMENT: Need to keep the plans short and simple, for those who know nothing about plant pathology. Don't need all the biology. Focus on management/control.

### **Diagnosis**

- Need a more comprehensive list of diagnostic resources (e.g., NPDP).
- If the symptoms look like indigenous diseases, why/when should someone become suspicious?
- Conidiophore morphology is diagnostic. That needs to be in the SOP.

There was a fair amount of discussion here about first detection and diagnosis. These topics don't necessarily fit in a "recovery" plan, but they are inter-related and diagnosis is certainly an essential component of survey work to delimit an outbreak, or to track its spread. The diagnostic and education components are crucial. Will investment in the infrastructure be up front, or after-the-fact (too late)?

### **Survey and detection**

- Need to clarify when it's regulatory and when it's not. Responses can be outside of the regulatory process.
- Need some better description of where to survey (e.g., sentinel plots, low-lying, wet areas)

### **Economic Impact and Compensation**

This section does not give a clear picture of the situation. It discusses losses in the Philippines, and states that losses are greatest in tropical areas that receive 38-78 inches of rain per year. It also states that losses were high in India, before resistant cultivars were introduced, but does not indicate what the situation is like with resistant cultivars. Overall, this section does not provide a useful indication of what might happen in the US with our climate, cultivars, fungicides, cultural practices, etc.

Not sure of the value of listing all the policies covering insurance programs. Could simply say that "insurance is available."

### **Mitigation and disease management**

- How does recovery bring the various agencies into play? How would their differing responsibilities and capabilities be coordinated into a comprehensive mitigation effort?
- Are fungicides economically feasible?
- This section needs to look beyond just the growers. It needs to consider the entire supply chain, right up to the consumer.
- Screening germplasm is a first step in a recovery plan. It should be part of the infrastructure

- All industry/germplasm producing groups are going to want to be represented in screening trials. Also need a decision on spraying seed production fields.
- Need to screen germplasm resources. An “Ag Bioshield” effort. Is there an inventory of resistant cultivars/germplasm? What is the role of Land Grant Universities in the germplasm evaluation?
- Need to include some description of the immediate delineation of an outbreak. A regulatory function—mitigation of the initial outbreak—which could involve eradication efforts. What is the feasibility of eradication?
- Need a brief section on “transitioning” parameters—moving from initial mitigation efforts to longer-term management.
- Other host plants need to be considered in the management plan.

### **Research priorities**

- The present listing of short-term needs is not really a list of research priorities. It is a collection of calls to compile lists of bibliographies, symptom photographs, industry activities, etc.
- Move #3 long-term (investigate reports of fungicide resistance) to the short-term list.
- There should be an explicit plan for extension and education relating to these (and all other) diseases.
- Long Term research topics 6-9 are important activities that could be done internationally where the diseases already occur. For example, #9 (temperature and dew effects on BSDM)—we could commit resources toward research where the pathogen already occurs so we know what to expect in the US, and know better where to focus monitoring programs.
- Split the report of the two diseases, since the priorities may differ depending upon specific disease.