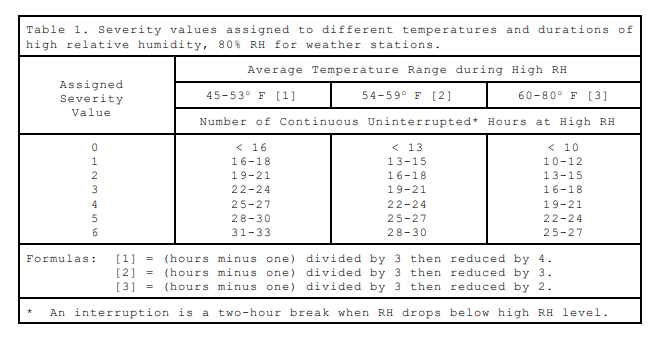
|  |  |  |  |
| --- | --- | --- | --- |
| ***S.No*** | ***Insect*** | ***Symptoms*** | ***Prevention*** |
|  | Potato Tuber Moth | Transparent blistersImage result for effect of potato tuber moth on leaves  (Light green part becomes brown after sometime) | 1)Two sprays with 0.05% quinalphos or 0.1% carbaryl at 15 days interval .  Insecticides used for aphids can also be used. |
|  | Potato Cut worm | Boreholes  Image result for potato cutworm damage on leaves  Image result for potato cutworm damage on leaves | 1)5% cabaryl poison 25-60 kg/hg  2)Soil application of chlordane or heptachlor dust at 50 kg/hg  3)Coragen 20 SC 300 ml/hg or tracer 48 SC 200ml/hg or Indoxacarb 30 WG 130g/hg |
|  | Epilachna Beetle of Potato | Eat chlorophyll of leaves between veins and cause characteristic skeletonised patches on leaves  Image result for Epilachna Beetle of Potato | Spray of Malathion 50 EC in 200 liters of water |
|  | Aphids | Can’t be identified by camera  But after sometime leaf become like thisImage result for aphids in potatoes | Confidor (imidacloprid) 70 WG 124g/hg or Actara 25 WG 80g/hg after 6 weeks of plantation |
|  | Jassids of potato | Damaged leaves curl upwards along the margin and yellowish and show burnt patches  Image result for jassids of potato harm on leavesImage result for jassids of potato harm on leaves | Spray 300ml of Rogor 30EC (dimethoate) or metasystox 25EC (methyl-demeton) or 75 ml of dimecran 85SL (phosphomidon) in 80-100 liters of water per acre. |
|  | Thrips | Leaves turn downward and change to black silver color  Image result for thrips damage potato leaves | Imidacloprid @ 1ml in 3-4 liters of water or fipronil @ 2ml per liter |
|  | White Grub | Usually on potatoes in roots |  |
|  | Potato Cyst Nematodes | damage root |  |

Link:-<http://www.krishisewa.com/articles/disease-management/137-potato-insect-pests.html>

**LATE BLIGHT**

* Late blight (Phytophthora infestans) fungus
* Irish potato famine in the mid-nineteenth century
* Type A1 and A2

**Symptoms**

* first appear as water-soaked spots
* water-soaked spots rapidly enlarge and a broad yellow halo may be seen
* Under continuously wet conditions, the disease progresses rapidly and warm, dry weather will slow or stop disease development
* Tuber lesions first appear as irregular, dark blotches
* Under favourable conditions it can spread 50 miles in a day
* The area under center-pivot irrigation that is most susceptible to late blight is the first 100 feet out from the pivot (center tower)
* In the past, fungicides were not applied until late blight was visible. But, that is too late. A good fungicide program can greatly delay the development of the fungus and the onset of late blight
* Ideal temperatures-50-60oF at night and 60-70oF in the day. A relative humidity of 90% in the canopy promotes pathogen development. Take values when at least 50 percent of the plants have emerged from the ground.
* Current device to measure temp. and humidity every week–hygrothermograph. After a grower has obtained the needed data, the ***severity values*** [(for value calculation)](https://cropwatch.unl.edu/documents/Forecasting%20Late%20Blight_table1.pdf) can either be calculated directly by a grower using a pencil or paper or can be typed into the “Potato Crop Management” (PCM) program developed by the University of Wisconsin.
* The severity value is a measure of the interaction between temperature and relative humidity in the presence of the late blight fungus. Table 1 shows how severity values are assigned to specific conditions. If there is no late blight observed in the field nor in a nearby field, then a cumulative severity value total of 18 predicts late blight symptoms are to appear in 7 to 14 days if the inoculum is present and no fungicides are applied.
* A recording ***hygrothermograph*** basically keeps track of hourly changes in air temperature and relative humidity. Its placement:-  
  1. Within the potato canopy, preferably in a low spot of the field.  
  2. Near the center of a pivot system where irrigation keeps the vines wet.  
  3. Close to a body of water, e.g., stream, ditch or pond.  
  4. Near a fence row or woods where air movement is restricted.  
  5. On the leeward side of windbreaks, e.g., trees, barn.

Link:-<https://cropwatch.unl.edu/potato/late_blights>

**EARLY BLIGHT**

* Caused by Alternaria solani, attack older leaves which plant is under stress or aged.
* a) Early symptoms appear on lower, older leaves. Lesions appear as round dark spots with concentric rings inside, hence the name target spot. These lesions occur between the veins and as they grow remain bordered by them thereby getting an angular shape. As the plant ages, lesions move up the plant infecting younger leaves and, in severe cases, infect the stem.

b) Later as the disease progresses, the leaf spots join forming larger lesions. Sometimes a yellow edge to the lesions can be seen. Leaf clorosis (yellowing) occurs then cells die (necrosis). The leaves desiccate and fall (defoliation). In severe cases, early blight will also infect the stem, usually in the upper half of the plant. Stem lesions appear as rectangular or oblong blotches that enlarge and turn necrotic thereby hastening vine death. Spores are spread leaf to leaf and plant to plant by breezes.

Link:-<https://cropwatch.unl.edu/potato/early_blight>

**ALTERNATA BLIGHT**

* Caused by Alternaria alternate
* I. Leaf symptoms are small, dark brown lesions of dead cells. Brown spot can occur throughout the season and usually is first seen before early blight. Its lesion look similar to new lesions of early blight; however although brown spot lesions have rings, they are fewer and are irregular than those of early blight and the lesions do not grow as large as early blight. High humidity, leaf wetness such as prolonged dew, and warm temperatures are conducive to infection. There is a half percent yield loss for every 1% of leaf area infected.

II. Spores of A. alternata can travel in the soil and may even live there. They may infect underground tubers late in the season or infect tubers during harvest.

III. Brown spot and black pit are not considered major disease problems in potato. Often brown spot can be an early indication that early blight infection is also present although symptoms are not seen yet. Alternata blight is controlled by the same chemistries used for early blight so special treatment is rarely required.

Link:-<https://cropwatch.unl.edu/potato/alternata_blight>