

# A SURVEY OF SOME COMMON CROP DISEASES FROM KINWAT TALUKA OF NANDED DISTRICT (MAHARASHTRA STATE), INDIA

Eanguwar Srinivas Reddy<sup>1</sup>, Shivraj Kashinath Bembrekar<sup>2</sup>

<sup>1 & 2</sup> Department of Botany, Baliram Patil College, Kinwat, Nanded District, Maharashtra, India.

Email - eanguwarSRINIVAS@gmail.com

**Abstract:** A survey of plant diseases on various crops in standing fields was carried out during June-2016 to April-2017. The objectives of the study was to collect, identify, and preserve plant diseases occurring plants from surroundings fields of Kinwat Taluka of Nanded District, Maharashtra, India. The total 34 infected crop plants were identified and host for various diseases and 25 pathogens were identified as a causal organisms for these diseases. The importance of these observations lies in the relationship between metrological changes and the prevalence, severity, and relative importance of particular zone were discussed.

**Key Words:** Plant, diseases, agriculture,

## 1. INTRODUCTION:

Agriculture is the mother of all cultures. It has played a key role in the development of human civilization. Agricultural practices such as irrigation, crop rotation, fertilizers, and pesticides were developed long ago, but have made great progress in the past century. By the early 19th century, agricultural techniques had so improved that yield per land unit was many times that seen in the middle ages (Arivazhagan *et.al.*2013). Man is directly dependent upon plants for his survival because plants are his prime source of food, fiber and drugs, the crop production is one of the basic human activity for continued existence of human life, the total production depends on healthy crops, whether it may be cereals, pulses, oil seeds, fruit plants or vegetables. A number of plant pathogens (Viruses, mycoplasma, bacteria, fungi and nematodes) attack on the crop plants and decrease the quality, quantity and productivity of crop (Ayyappan *et.al.*2007).

The world's population will increase from the present level of about 7.25 billion to 15 billion by the year 2050. Providing food for such a large number of people will be a formidable task. So, there would always be a compulsion to increase agricultural production in spite of the fact that cultivable land would be decreasing due to its requirement for non-agricultural uses such as expanding urbanization, and rail and road network, etc. According to recent estimates, agricultural production would need to be increased by 70 per cent (100% in developing countries) by 2050 to cope up with the increasing world population (Saini, 2014).

Food plants of the world are damaged by 100,000 diseases (caused by fungi, viruses, bacteria, and other microorganisms), 10,000 species of insects, 1000 species of nematodes, and 30,000 species of weeds. It is essential for humans to take action to limit the destruction of food crops by pests. Crop pests must be controlled to protect the security of the world food supply. Pimentel and Levitan (1986) estimated that "total worldwide food losses from pests amount to about 45% (of total food production). Pre-harvest losses from insects, plant pathogens, and weeds amount to about 30 per cent. Additional post harvest losses from microorganisms, insects, and rodents range from 10 to 15 per cent.

The role of plant pathology is important for alleviating losses to the agricultural products, plants are also important to man because they utilize CO<sub>2</sub> in photosynthesis and release O<sub>2</sub> (Mehrotra,2000).The present study is an observation on plant diseases on various crops in standing fields found in surrounding area in Kinwat Taluka of Nanded District, Maharashtra, India.

## 2. MATERIAL AND METHODS:

The Kinwat Taluka came into existence in 1905, today Kinwat is known for its natural beauty and elegance, Kinwat is located at 19.63°N 78.2°E in the Indian state of Maharashtra in the district of Nanded. It has an average elevation of 314 meters (1030 feet), the Penganga River flows alongside the town.

**2.1 Demographics:** The total villages in Kinwat Taluka is 250, total population of Kinwat Taluka is 210,630 living in 42,189 Houses, Spread across total 250 villages and 135 panchayats, Males are 107,337 and Females are 103,293, total 24,878 people's lives in town and 185,752 lives in Rural, it is one of the hilly and backward Taluka of Maharashtra state,

**2.2 Weather and Climate:** It is too hot in summer. In summer highest day temperature is in between 33 °C to 46 °C Average temperatures of January is 25 °C, February is 27 °C, March is 31 °C, April is 35 °C, May is 39 °C.

**2.3 Seasons:** The south-west monsoon season this follows there after lasts till about the first week of October. The rest of October and the First half of November constitute the post-monsoon season.

**2.4 Record of average rainfall in the year 2017**

Month	Average Rainfall in Millimeters
June	7.1 mm
July	14.9 mm
August	3.54 mm
September	6.9 mm
October	2.74 m

**2.5 Temperature:** December is the coldest month. with the mean daily minimum temperature at about 13°C (55.4°F) and the mean daily maximum at about 29°C (84.2° F). The minimum temperature may go down to about 5°C (41.0°F). May is the hottest month of the year with the mean daily maximum temperature at about 42°C (107.6°F).

**2.6 Humidity:** The relative humidity is between about 60 and 80 percent, with the withdrawal of the south-west monsoon, humidity gradually decreases and in the cold and summer seasons the air is generally dry. The summer season is the driest part of the year when the relative humidity in the afternoons is generally less than 30 per cent.

**2.7 Cloudiness:** Skies are heavily clouded to overcast in the south-west monsoon season. The cloud amount decreases rapidly in the post-monsoon months. In the rest of the year skies are clear or lightly clouded.

**2.8 Special Weather Phenomena:** Thunderstorms occur in the summer and monsoon months, their frequency being higher in June and September. Dispraising winds are common in the summer afternoons. Storms and depressions from the Bay of Bengal or the Arabian Sea seldom affect the district.

**2.9 Total agricultural land:** The total area of land of Kinwat Taluka is 201235 Square Kilometers, out of that 57256 Square Kms covered by forest area and total agricultural land is **112158** Square Kms.

**2.10 Time and procedure of data collection:** The data on diseased plants for this study area was collected through regular visits in all different locations of Kinwat Taluka, along with the personal interviews with the cultivators (farmers).

**2.11 Plant disease collection and Identification:** The standard method was followed with regard to collection of plant material, drying, mounting, preparation and preservation of plant specimens (Jain and Rao, 1976), The identification and nomenclature of the plants were based on the (Hooker, 1872-1897), the flora of Bombay presidency (Cooke, 1967), 'Flora of Maharashtra, Blatter herbarium' (Almeida, 1996), Flora of Marathwada, Vol.1 & 2, (Naik, 1998), Singh (2001) Flora of Madhya Pradesh, Vol.3. BSI Publication, Calcutta, India, and (Yadav and Sardesi, 2002). After identification of collected plant species, prepared herbarium sheets.

**2.12 Pathological investigation:** Extensive survey was made in Kinwat Taluka to gather the data on the plant diseases, it is collected through general conversation with the cultivators (farmers) with questionnaires, and the information on crop plant diseases was cross checked with relevant literature (Mehrotra, 2000) and (Rangasami, 1988).

### 3. RESULTS AND DISCUSSION:

The survey of plant diseases on various crops in the surrounding area of Kinwat Taluka shows total number of diseases on host plants are 31 detected, out of these 12 diseases on vegetable, 7 fruit bearing plants, 6 pulses, 6 cash crops and 3 oil seeds were noted. The causal organisms mostly fungal pathogens, total diseases attacked by fungal are 18 and important pathogens are Phytophthora on *Capsicum*, Colletotrichum on *Artocarpus*, Septoria on *Solanum*, Erysiphe on *Cucumis*, Fusarium on *Zingiber* and *Cajanus species*, Alternaria on *Cucumis* and *Glycine species*, Elsinoe on *Citrus*, Viral 5. Bacterial 5, pest 5 and only one mycoplasmal. They are depicted in Table No. 1 with botanical name of host plant and local name, disease name and causal organism (pathogen). The incident of diseases is dependent on climatologically factors from this particular area, so probably the occurrence of disease increase or decrease. The prevalence of diseases and its ultimate effect on final agricultural product is well known, the present observations shows that during this year the above mentioned diseases are suddenly increased resulting in low production of crop, this is revealed by interview with the local farmers. The sudden climatologically changes scarcity of water or unwanted showers ultimately resulted in low productivity.

**Table No. 1-List of plant diseases**

Sr. No.	Botanical name (Host Plant)	Local name (Host)	Disease name	Pathogen (Causal organism)
1	<i>Capsicum frutescens. L</i>	Mirchi	Curly leaves of chilli	Phytophthora capsici
2	<i>Solanum lycopersicum L.</i>	Tomato	Curly leaves of tomato	TYLC- Virus
3	<i>Solanum tuberosum L.</i>	Batata	Late blight of potato	Phytophthora infestens

4	<i>Spinacia oleracea L</i>	Pallak	Leaf miner of spinach	<i>Pegomya hyoscyami</i>
5	<i>Trigonella foenum-graecum L.</i>	Methi	Leaf miner of foenum	<i>Pegomya hyoscyami</i>
6	<i>Artocarpus heterophyllus</i>	Panas	Leaf spot of jackfruit	<i>Colletotrichum gloeosporioides</i> Penz
7	<i>Solanum lycopersicum L.</i>	Tomato	Leaf spot of tomato	<i>Septoria lycopersici</i>
8	<i>Solanum melongena L.</i>	Wange	Little leaf of brinjal	Mycoplasma like bodies
9	<i>Cucumis sativus L.</i>	Kakdi	Powdery mildew of cucumber	<i>Erysiphe cichoracearum</i>
10	<i>Zingiber officinale Roscoe</i>	Adrak	Dry rot of ginger	<i>Fusarium yellows</i>
11	<i>Cucumis colocynthis L.</i>	Kadu	<i>Alternaria</i> leaf blight	<i>Alternaria cucumerina</i>
12	<i>Coriandrum sativum L.</i>	Sambar	Frog eyes spot	<i>Pseudomonas syringae</i> P.V. <i>coriandricola</i>
13	<i>Ziziphus jujuba Lamk.</i>	Bor	Leaf borer	<i>Eutrocitis fraterna</i>
14	<i>Mangifera indica L.</i>	Amba	Leaf spot of mango	<i>Xanthomonas campstris</i> P,V. <i>mangiferaeindicae</i>
15	<i>Citrus sinensis L. Osbeck</i>	Santra	Sweet orange scab	<i>Elsinoe australis</i>
16	<i>Ziziphus jujuba Lamk.</i>	Bor	Powdery mildew	<i>Oidium ziziphi</i>
17	<i>Citrus aurantifolia (Christm &amp; Panz.) Swing.</i>	Limbu	Citrus cancer	<i>Xanthomonas axonopodis</i> P.V. <i>citri</i>
18	<i>Musa sapientum L.</i>	Kela	Banana leaf borer	<i>Odoiporum longicollis</i>
19	<i>Citrus sinensis L. Osbeck</i>	Santra	Citrus virus	Citrus tristeza virus
20	<i>Cajanus cajan (L.) Millsp.</i>	Tur	Wilt of Tur	<i>Fusarium oxysporus</i>
21	<i>Vigna aconitifolia (Jacq.)</i>	Chaudii	Bean yellow mosaic	Bean virus
22	<i>Lablab purpureus var. typicus</i>	Aura (Val)	Pod borer	<i>Spencerches caffer</i>
23	<i>Cicer arietinum L.</i>	Channa	Arhar mosaic	Arhar mosaic virus
24	<i>Vigna radiate(L.) Millsp.</i>	Mung	Yellow mosaic	Mung bean yellow mosaic virus
25	<i>Cajanus cajan (L.) Millsp.</i>	Tur	<i>Cercoseptoria</i> leaf spot	<i>Cercoseptoria cajanicola</i>
26	<i>Gossypium herbaceum L.</i>	Kapus	Angular leaf spot of cotton	<i>Xanthomonas axonopodis</i>
27	<i>Saccharum officinarum L.</i>	Yus	Whip smut of sugar cane	<i>Ustilago scitaminea</i> sydiw
28	<i>Curcuma longa L.</i>	Halad	Leaf spot of turmaric	<i>Taphrina maculans</i> butler
29	<i>Pennisetum typhoides</i>	Bajra	Ergot of bajra	<i>Claviceps purpurea</i>
30	<i>Sorghum verticilliflorum (Steud.)</i>	Jawar	Rust of jawar	<i>Puccinia purpurea</i>
31	<i>Hordeum vulgare L.</i>	Ghau	Loose smut of Wheat	<i>Ustilago nuda</i>
32	<i>Ricinus communis L.</i>	Yerandi	Leaf s pot of castor	<i>Phytophthora colocasiae</i>
33	<i>Arachis hypogea L.</i>	Buymun g senga	Tikka disease of groundnut	<i>Cercosporidium personatum</i>
34	<i>Glycine max (L.) Merrill.</i>	Soya bean	<i>Alternaria</i> leaf spot	<i>Alternaria</i> species

#### 4. CONCLUSION:

The observations shows that incidence of these diseases increase or decrease in this year due to climatic change probably, in the future efforts should be made towards the integration of multiple control options like development of resistance varieties, improved agronomic practices, awareness creation among farmers and experts right from site selection till post harvest handling of various diseases and their management. In general holistic, cumulative integrated approach is required in all urgency to manage the complex diseases in the survey area.

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