

International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693
ISSN Online: 2617-4707
IJABR 2024; 8(12): 1269-1272
www.biochemjournal.com
Received: 12-09-2024
Accepted: 15-10-2024

YR Govekar
Regional Fruit Research
Station, Vengurle, Sindhudurg,
Maharashtra, India

VK Zote
Regional Fruit Research
Station, Vengurle, Sindhudurg,
Maharashtra, India

Shri PM Talha
Regional Fruit Research
Station, Vengurle, Sindhudurg,
Maharashtra, India

Shre SS Bhure
Regional Fruit Research
Station, Vengurle, Sindhudurg,
Maharashtra, India

Corresponding Author:
YR Govekar
Regional Fruit Research
Station, Vengurle, Sindhudurg,
Maharashtra, India

Studies on location specific seasonal survey for digital mapping of important cashew diseases

YR Govekar, VK Zote, Shri PM Talha and Shre SS Bhure

DOI: <https://doi.org/10.33545/26174693.2024.v8.i12p.3424>

Abstract

The field experiment has been conducted in 2021-22 & 2022-23 to study the location specific survey for digital mapping of important disease of cashew in Sindhudurg district. The data of disease index of different cashew disease has been collected at two different locations from each tehsil of Sindhudurg district. The collected information was compiled and formatted in to virtual image on computer by producing map that gives accurate information of disease status of cashew in the Sindhudurg district. There were only four diseases were recorded in cashew, viz red rust, branch dying, yellow leaf spot and apple rot during both year, the Kudal and Kankavli Tehsil recorded, high percent disease index of cashew disease such as red rust and branch dying respectively during all recorded seasons. The intensity of all disease get decreases in 2022-23 comparative 2021-22 which shows decreasing trend of disease.

Keywords: Cashew, digital mapping, disease intensity, PI, PDI, Sindhudurg, winter and summer seasons

Introduction

Cashew has been an important crop in Konkan region of Maharashtra state. The present study was undertaken to study the variation in disease intensity of cashew in Konkan region of Maharashtra state. The variation of disease incidence and severity of disease of cashew resulting from devastating effects of plant pathogens, limits crop productivity globally, thus affecting food security. The effects of globalization, climate change, evolution and new emergence of pathogens, increases the more variation in spread of different plant disease. (Agrios, 2005) ^[1]. Plant-pathogenic fungal, bacterial and virus growth, development and disease is guided by critical environmental factors and are crucial in limiting the quality and quantity of agricultural produce. (Srinivas 2022).

Climate change also disrupts and alters the distribution of different diseases, which poses a threat to agriculture (Rosenzweig *et al.*, 2000; Scherm *et al.*, 2000) ^[6, 7]. The season wise climate variation is becoming increasingly extreme and unpredictable (Paul *et al.*, 2009) ^[5]. Consequently, early detection of pathogens, accurate diagnosis, assessment and its immediate intimation to the beneficiary or farmers is very crucial to undertake prevention and management measures in a particular area. (Myerson and Reaser, 2002) ^[4]. Lack of these measures will lead directly to inadequate disease control and reductions in crop production and quality. The collection and interpretation of data can be compiled and formatted in to virtual image on computer by producing map is called as digital mapping which will gives quick accurate information of disease status status for the users or beneficiary. (Ann Jones *et al* 2004) ^[2]. The Digital mapping will help to transfer the technology of cashew disease to enhance the delivery of public services, improve efficiency, and faster transparency (Guler M and Buyukozkon G 2023) ^[3].

With this view, the efforts have been made to do location specific survey for digital mapping of important disease of cashew in Sindhudurg district during winter and summer season for consecutive two years (2021-22) & (2022-23). The data of different disease collected is compiled and formatted into virtual image and make available for users.

Materials and Methods

A Field experiment was started by conducting fixed location survey of Cashew crop during winter and summer season 2021-22 & 2022-23 at the different selected locations in Sindhudurg district.

The trial has been initiated by selecting the two farmers from each Tehsil of Sindhudurg district so as to conduct the fixed plot survey for digital mapping. The five trees each of cashew were selected and tagged for future monitoring. . On the basis of observations, Percent Disease Incidence (PI) and Percent Disease Index (PDI) of cashew were calculated. (Table no.1, 2 3 &4).

The Percent Incidence (PI) and PDI is calculated by following formula.

$$\text{Percent Incidence (PI) (\%)} = \frac{\text{No. of disease plant part observed}}{\text{Total number of plant part observed}} \times 100$$

Per cent Disease Index (PDI) was calculated by using the formula.

$$\text{PDI (\%)} = \frac{\text{Sum of all disease ratings}}{\text{Total no. of ratings} \times \text{Maximum disease grade}} \times 100$$

Table 1: Comparative study of Percent Incidence (PI) of minor disease of Cashew during the last two years during winter. (OCT-21 TO JAN-22) and (OCT-22 TO JAN-23).

Locations	Red rust (PI)		Yellow Leaf Spot (PI)		Branch dying (PI)	
	2021-22	2022-23	2021-22	2022-23	2021-22	2022-23
Dodamarg	6	04	14	06	2	00
Sawantwadi	4	06	12	00	4	00
Kudal	16	12	24	00	2	00
Kankavali	10	08	28	04	4	00
V.wadi	8	04	16	04	6	04
Vengurla	4	04	12	00	2	00
Deogad	4	04	8	04	2	00
Malvan	6	02	12	00	4	10
Average	7.25	5.5	15.75	2.25	3.25	1.75

Table 2: Comparative study of severity (PDI) of minor disease of Cashew during the last two years during winter. (OCT-21 TO JAN-22) and (OCT-22 TO JAN-23).

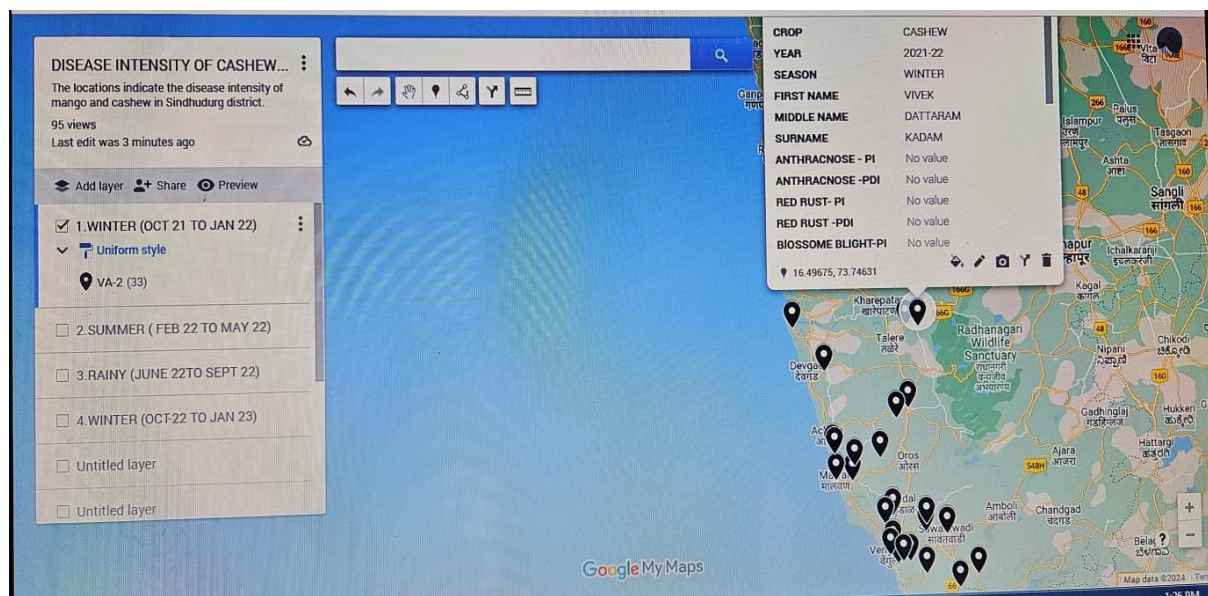
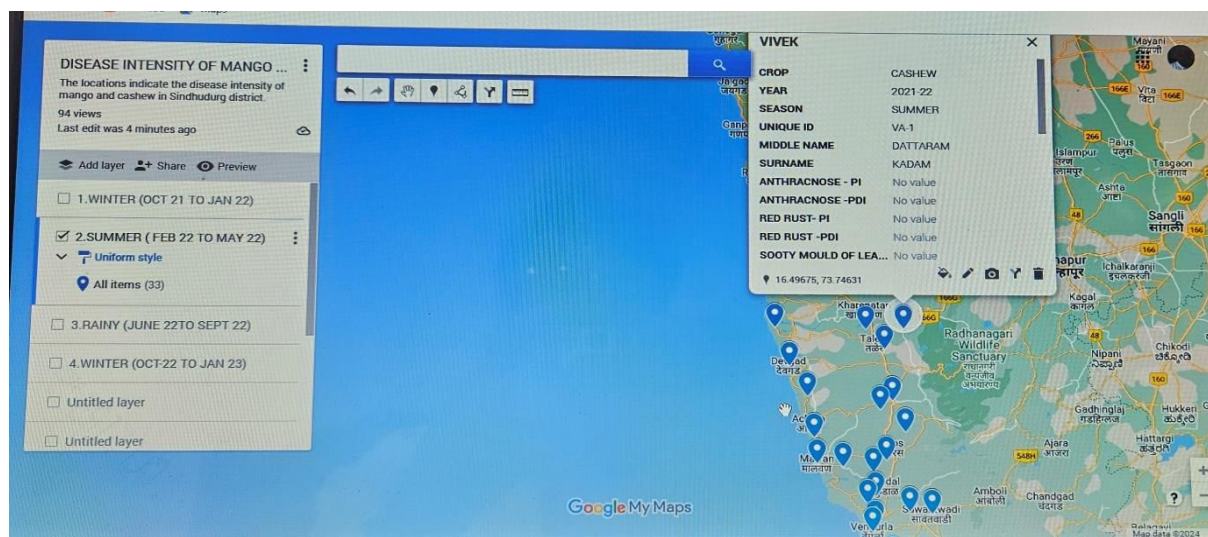
Locations	Red rust (PDI)		Yellow Leaf Spot(PDI)	
	2021-22	2022-23	2021-22	2022-23
Dodamarg	1.2	1.2	0.8	2.0
Sawantwadi	0.8	2.4	0.0	0.0
Kudal	6.4	3.2	0.0	0.0
Kankavali	3.6	2.8	0.8	1.2
V.wadi	3.6	1.2	1.6	1.2
Vengurla	1.2	1.6	2.4	0.0
Deogad	0.8	1.6	0.4	1.2
Malvan	2.0	0.4	0.0	0.0
Average	2.45	1.8	0.75	1.75

Table 3: Comparative study of Percent Incidence (PI) of disease of Cashew during the last two years during Summer. (FEB-22 TO MAY-22) and (FEB-23 TO MAY-23).

Locations	Red rust (PI)		Yellow Leaf Spot (PI)		Branch dying (PI)		Apple rot	
	2021-22	2022-23	2021-22	2022-23	2021-22	2022-23	2021-22	2022-23
Dodamarg	8	06	24	6.0	2	0.0	6	6.0
Sawantwadi	8	10	20	0.0	2	0.0	4	4.0
Kudal	16	12	32	0.0	2	0.0	2	2.0
Kankavali	12	10	36	6.0	2	0.0	2	4.0
V.wadi	10	06	24	8.0	4	6.0	2	2.0
Vengurla	6	06	20	0.0	2	0.0	4	4.0
Deogad	10	04	16	6.0	2	0.0	2	2.0
Malvan	8	04	22	4.0	4	12.00	4	4.0
Average	9.75	7.25	24.25	3.75	2.5	2.25	3.25	3.5

Table 4: Comparative study of severity (PDI) of disease of Cashew during the last two years during Summer. (FEB-22 TO MAY-22) and (FEB-23 TO MAY-23).

Locations	Red rust (PDI)		Yellow Leaf Spot(PDI)	
	2021-22	2022-23	2021-22	2022-23
Dodamarg	2.0	02	10	2.0
Sawantwadi	2.4	3.2	8.4	0.0
Kudal	6.4	04	13.6	0.0
Kankavali	4.4	3.6	14.4	2.4
V.wadi	4.4	2.0	10.8	3.2
Vengurla	2.0	2.0	8.4	0.0
Deogad	3.2	2.0	6.4	2.0
Malvan	2.8	1.2	9.6	1.2
Average	3.45	2.5	10.2	1.35

**Photo 1:** The photograph showing the digital map of cashew disease in Sindhudurg district during winter (2021-22).**Photo 2:** The photograph showing the digital map of cashew disease in Sindhudurg district during summer (2022-23).

Results and Discussion

In case of Cashew, during both year, the Kudal and Kankavali Tehsil recorded, high percent disease index of cashew disease such as red rust and branch dying respectively during all recorded seasons. The results also revealed that almost the diseases such as red rust, branch dying, yellow leaf spot and having decreasing trend (2022-23) as compared to previous year (2021-22). All the data has been digitalized in the form of digital mapping.

Conclusion

There is a seasonal variation in the disease intensity of diseases of cashew was found in Sindhudurg district. It is also observed that there is no new emergence of disease. The comparison between 2021-22 and 2022-23 clearly shown that the major diseases such branch dying, red rust get decreases. The apple rot disease is remain unchanged as compared to previous year. The data has been digitalised in the form of digital mapping of cashew disease which gives

an instant information for the various farmers across the Sindhudurg district. After getting instant information at one location by cashew growers or expert or researcher through internet mode, he will immediately take precaution of the crop at his farm. This digital mapping will help him for early detection and diagnosis of disease for timely applications of foliar fungicides to avoid devastating losses. The quick information about the rapid diagnosis of plant pathogens is also critical because some fungicides cannot be applied after a certain stage in plant's maturity.

Acknowledgement

Authors are thankful to the number of the selected farmers from Sindhudurg district, Mango Sub-Centre Girye and the Mango Center of Regional Fruit Research Station, Vengurla Maharashtra, India for providing the mango plants to the experiment.

References

1. Agrios GN. Plant Pathology. 5th ed. USA: Elsevier; 2005. p. 922.
2. Jones CB, Davies C, S. Eileen. Digital maps for learning: a review and prospects. Computers and Education. 2004;43(1-2):91-107.
3. Guler M, Buyukozkon G. A survey of digital government: science mapping approach, application areas, and future directions. Systems. 2023;11:563.
4. Myerson LA, Reaser JK. Biosecurity: moving toward a comprehensive approach. Bioscience. 2002;52:593-600.
5. Paul H, Ernsting A, Semino S, Gura S, Lorch A. Agriculture and climate change: real problems, false solutions. Oxford, UK: EcoNexus; 2009.
6. Rosenzweig C, Iglesias A, Yang YB, Epstein PR, Chivian E. Climate change and U.S. agriculture: the impacts of warming and extreme weather events on productivity, plant diseases, and pests. Boston, MA, USA: Center for Health and the Global Environment, Harvard Medical School; 2000. p. 46.
7. Scherm H, Sutherst RW, Harrington R, Ingram JSI. Global networking for assessment of impacts of global change on plant pests. Environmental Pollution. 2000;108:333-341.