J. Farm Sci., 29(1): (121-122) 2016

Incidence of groundnut bud necrosis disease in Karnataka

Groundnut (*Arachis hypogaea* L.) is an important oilseed, food and fodder crop. It is among the top three of eight oil seed crops used in the world for vegetable oil production. India ranks second in production with 5 million tonnes from an area of 5 million ha next to China (Anon., 2013). In India, Gujarat, Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra and Rajasthan states contribute 90 per cent of total production. Karnataka ranks fourth in the country with a production of 7.42 lakh tonnes from an area of 8.48 lakh ha and productivity of 875 kg/ha (Anon., 2012).

The groundnut bud necrosis disease (GBND) was first reported at Indian Agricultural Research Institute (IARI), during 1949 and later by Chohan (1972). The name "bud necrosis" was given by Reddy *et al.* (1968). GBNV has been described in India since 1962 under seven different names: groundnut mosaic, groundnut rosette, bunchy top, chlorosis, ring mottle, bud blight and ring mosaic. In Karnataka, the disease was first reported from Dharwar by Siddaramaiah *et al.* (1977).

The roving survey was conducted in ten major groundnut growing districts of Karnataka, *viz.*, Bagalkot, Belagavi, Ballary, Chitradurga, Dharwad, Gadag, Haveri, Koppal, Raichur and Tumkur, to know the incidence of groundnut bud necrosis disease during *kharif* 2012 and *rabi*/summer 2012-13 seasons. The survey was made to record the incidence of GBND in the fields located on both sides of the road. In each village five fields were selected and in each field area of 10 sq mt was chosen. In each field similar observations were made at four different spots. During survey, information of soil type, crop stage, irrigation condition, latitude, longitude and elevation were collected. The percentage of disease incidence was assessed by recording the number of plants showing disease symptoms and the total number of plants examined by using the formula.

$$\text{Per cent disease incidence} = \frac{\text{Number of diseased plants}}{\text{Total number of plants examined}} \times 100$$

During survey, it was noticed that bud necrosis diseased groundnut plants exhibited typical symptoms *viz.*, chlorotic and necrotic spots, chlorotic and necrotic ring spots on leaves, chlorosis of plant, axillary shoot formation, malformation of bud, drooping of leaf, bud chlorosis, terminal bud necrosis and stunted growth of plant. The findings are in agreement with the studies on types of GBND symptoms observed by Srinivasaraghavan *et al.* (2012).

One hundred twenty three villages in ten districts were surveyed during *kharif* 2012 (Table 1). The highest bud necrosis disease incidence of 19.09 per cent was recorded in Raichur district followed by Koppal (16.0%), whereas the lowest incidence of 8.2 per cent was observed in Dharwad district. Similarly during the rabi/summer 2012-13, 86 villages were surveyed. The highest incidence of 24.0 per cent was recorded in Raichur district followed by Tumkuru (20.1%), whereas the lowest incidence of 10.5 per cent was recorded in Dharwad. The highest mean incidence of 21.6 per cent recorded in Raichur district followed by Koppal (17.9%) and Tumkuru (17.1%). The least incidence of 9.4 per cent was recorded in Dharwad district. However, the mean incidence of 15.0 per cent recorded in surveyed area of Karnataka state. Therefore Raichur can be one of the "hot spots" for bud necrosis disease which recorded highest incidence of 21.5 per cent.

Table 1. GBND incidence in Karnataka during 2012-13

Districts	Disease incidence (%)		
	Kharif -2012	*Rabi*/summer 2012-13	Mean
Bagalkot	15.6	18.5	17.0
Belagavi	10.4	17.5	13.9
Bellary	13.7	19.7	16.7
Chitradurga	13.3	15.0	14.2
Dharwad	8.2	10.5	9.4
Gadag	11.2	11.8	11.5
Haveri	9.7	11.7	10.7
Koppal	16.0	19.8	17.9
Raichur	19.0	24.0	21.5
Tumkuru	14.1	20.1	17.1
Mean	13.1	16.9	15.0

In both *kharif* 2012 and *rabi* / summer 2012-13 seasons, groundnut was grown in red and black soil types (Table 2). The highest mean incidence of 15.8 per cent was recorded in red soil fields compared to black soil (12.7%) fields. The crop at maturity stage was recorded the highest mean incidence of 17.5 per cent compared to pod filling stage (12.8%) and in the irrigated fields (16.0%) compared to rainfed (12.8%) condition. In both the seasons GBND incidence was more in red soil with irrigation at maturity stage of the crop compared to black soil.

Bud necrosis disease incidence varied with different latitude (E), longitude (N) and elevation (meter) of the surveyed area. During 2012-13 the highest mean incidence of 19.70 per cent was recorded at latitude of $16^0$01'N-$16^0$59'N, 20.81 per cent at longitude of $077^0$01'E-$077^0$59'E and 20.92 per cent at elevation of 400-499 m (Table 3). The incidence of bud necrosis increased with increase in latitude, longitude and decrease in elevation condition. This may be due to influence of climate positively correlated with thrips vector activity, resulting in spread of the virus. From the present study it was concluded that the bud necrosis disease was prevalent in groundnut growing areas of Karnataka during both the seasons however, more in *rabi*/ summer season, and thus it was also found that the severity depended on cultivars grown, cropping pattern, soil type, vector population and climatic conditions.

Table 2. Prevalence of GBND incidence under different soil type, crop stage and irrigation condition during 2012-13

Season	Average disease incidence (%)					
	Soil type		Crop stage		Under	
	Red	Black	Pod filling	Maturity	Rainfed	Irrigation
Kharif-2012	14.2	11.2	11.7	15.7	12.8	15.4
Rabi/summer-2012-13	17.5	14.2	13.9	19.4	*	16.7
Mean	15.8	12.7	12.8	17.5	12.8	16.0

* : not grown

Table 3. Distribution of GBND incidence at different latitude, longitude and elevation during 2012-13

Season	Average disease incidence (%)											
	Latitude (N) (Degree)				Longitude (E) (Degree)				Elevation (Meters)			
	13^{0}01'-13^{0}59'	14^{0}01'-14^{0}59'	15^{0}01'-15^{0}59'	16^{0}01'-16^{0}59'	074^{0}01'-074^{0}59'	075^{0}01'-075^{0}59'	076^{0}01'-076^{0}59'	077^{0}01'-077^{0}59'	300-399	400-499	500-599	600-699
Kharif-2012	12.6	12.4	12.5	17.5	8.2	12.5	14.7	17.7	16.1	17.8	13.1	12.2
Rabi/summer-2012-13	-	15.5	15.4	21.8	15.5	14.4	19.0	23.8	*	24.0	15.6	15.5
Mean	12.6	13.9	14.0	19.7	11.8	13.5	16.9	20.8	16.1	20.9	14.3	13.8

* : not grown

Department of Plant Pathology, College of Agriculture
University of Agricultural Sciences,
Dharwad - 580 005, Karnataka, India
Email:chinmayi3@rediffmail.com

K. M. SWAMY
M. S. PATIL

(Received: December, 2014 ; Accepted: March, 2016)

References

Anonymous, 2012, Annual Progress Report, 2011. National Research Centre of Groundnut, Junagadh (India), pp. 1-3.

Anonymous, 2013, World oilseeds production. World oilseeds market. Miller Magazine http: //en. millermagazine. com/world-oilseeds-market/

Chohan, J. S., 1972, Final progress report of ICAR scheme for research on important diseases of groundnut. *Dept. Pl. Pathol. Punjab Agric. Univ.*, Ludhiana (India), p. 177.

Reddy, M. K., Reddy, D. V. R. and Rao, A. A., 1968, A new record of virus disease on peanut. *Pl. Dis. Rep.*, 52: 494-495.

Siddaramaiah, A. L., Krishnaprasad, K. L. and Jayamariah, S., 1977, Bud necrosis disease of groundnut in Karnataka. *Kissan World*, 4: 42- 44.

Srinivasaraghavan, A., Sunkad, G., Nalini, M. and Sudini, H., 2012, Serodiagnosis of *Peanut bud necrosis virus* of groundnut occurring in North-Eastern Karnataka. *Bioinfolet*, 9(2): 91-95.