ICAR-Indian Institute of Sugarcane Research Lucknow 226002

Red Rot Management Advisory (2023)

Red rot of sugarcane has been a menace for sugarcane cultivation in the subtropics during the past several decades and we have lost several elite varieties like Co 213, Co 312, Co 421, Co 453, Co 1148, Co 7717, CoS 8436, CoSe 92423, CoSe 95422 etc. Recently the most popular variety of sugarcane Co 0238 referred as 'wonder cane' has been succumbed to red rot after benefiting the industry for few seasons. We have noticed red rot during 2016-17 seasons in isolated pockets in UP and Bihar but it spread rapidly in time and space and currently occurs in almost all the districts in the states UP and Bihar. In the recent years, the other states viz. Punjab, Haryana and Uttarakhand in the region also witnessing moderate to severe outbreaks of the disease. ICAR-IISR, Lucknow and other research centres working under AICRP on Sugarcane in the region conducted extensive surveys for red rot incidences and assessed the crop losses in different districts.

Outcome of the surveys

- The variety Co 0238 is the dominant sugarcane variety in all the sugarcane growing areas irrespective of the States and it is cultivated in more than 65% of the cane acreage. In UP the variety is commanding throughout the state, except some parts of the dry west, and south-west. The maximum concentration is found in the Upper Ganga-Yamuna Doab, Rohilkhand and the Trans-Saryu plain which together account for 70% of the State's sugarcane production. Currently this dominant variety has indeed succumbed to red rot in almost all the locations. The overall incidence is quite high in the command areas of Muzaffarnagar, Meerut, Hapur, Moradabad, Barely, Pilibhit, Lakhimpur kheri, Shahjahanpur, Sitapur, Bahraich, Gonda, Ayodhya, Basti, Gorakhpur, Devariya, Kushinagar and all locations of Bihar ranging from 25 to 75 per cent incidences. Overall incidence is low in the command area of Haryana and Punjab ranging from 10 to 35 %, however, the red rot incidence of 10 to 35% in these states is posing an annihilating threat to the cane cultivation in the current season and will be alarming in coming cane cultivation seasons. The variety Co 0238 may be continued in cultivation with due care in the Haryana and Punjab by restricting the cultivation within 40 % area. Whereas in UP and Bihar, situation is alarming to cane cultivation due to the disease epidemics. It is found that almost in most of the areas surveyed, the red rot pathogen has reached the field through the infected seed cane (primary spread of the pathogen). An enquiry of the seed cane source from different farmers have revealed that invariably in the red rot affected fields, farmers have either used their own seed cane or have taken the seed cane from a relative or from a nearby farmer.
- Overall, sugarcane crop in the different sugar mill command areas surveyed appeared patchy and express poor yield and recovery due to red rot outbreak but at the same time sugar mills are trying to manage the disease but it does not guarantee a red rot free Co 0238 variety, if seed canes are not treated with fungicides in sett treatment device (STD).

Conclusively, the red rot pathogen has slowly mustered its strength by continuously accumulating inoculum with each passing season unhindered since 2016-17. The pathogen

has acquired a hyper virulence in the form a new pathotype CF13 favoured by monoculture of the variety.

- Occurrence of midrib lesions is very common in the endemic areas in UP and Bihar, which is mostly due to secondary spread of the pathogen through rain splash or air. During the grand growth phase, midrib lesions favour disease development from the spindle region. Hence even if the soil is free from the inoculum, the disease may occur through aerial route.
- The incidence of different insect pests is also observed in the command area; however, they do not play any significant role in the secondary spread of red rot pathogen.



Management strategies

- Keeping in view of the alarming situation of varietal breakdown to red rot in the variety Co 0238, the mills have to focus on immediate seed replacement in large areas. It is reiterated that the age-old advice and recommendation to have a mosaic pattern of varieties in the command areas. It is further advised that the sugar mill should restrain from increasing the acreage of a variety beyond 40% in the command area and should have a judicious blend of varieties to realize the productivity and profitability in a sustainable manner.
- Red rot is a highly manageable disease, however, the current situation of red rot in Co 0238 is highly alarming. Whereas, to sustain this variety a comprehensive disease monitoring is warranted to take up plant protection measures immediately after noticing the disease. A close vigil (regular surveillance) of the apparently healthy sugarcane crop of other varieties adjoining to the affected fields to detect red rot, especially during the summer months (up to July). Many a times, in the affected clump(s) (tillering phase), presence of spindle infections may be visible during this period. Removal and destruction of the affected, the rest of the crop is to be sprayed with a systematic fungicide like Thiophanate methyl (0.1%) at three weeks intervals (2-3 sprays depending on the disease severity). This monitoring is of utmost importance since incipient infectious are very common in the subtropical states and such infections incite the disease as primary source of inoculum.
- The affected fields along with surrounding fields should (due to the presence of incipient infections) be harvested immediately. The affected fields must be sanitized with application of fungicides, so that remaining soil borne inocula and the inocula dislodged during the removal of affected clumps be killed. In the affected fields, no trace of the Co 0238 be left and all the stubbles of the affected fields be removed and destroyed preferably by burning. Obviously, there will be no continuation of plant crop to raise a ratoon crop in the affected fields (Even if there is only one affected clump).

- In the affected field, rice-wheat crop rotation may be taken for at least one season or any oilseed crop may be taken during the same period after complete removal of red rot infected stubbles.
- After proper sanitization of the affected fields, a sugarcane crop (other than Co 0238) may be planted at least after one season during the following spring planting season (February-March planting). The varieties CoLk 14201, CoLk 15201, CoS 13235, Co 15023, CoLk 11203, CoLk 94184, CoLk 11206, CoLk 14204, CoS 14233 and CoLk 12207 are recommended in place of Co 0238.
- In red rot prone areas mechanized sett treatment with systemic fungicide like Thiophanate methyl (0.1%) in sett treatment device should be made mandatory to suppress the disease development in young crop. This treatment takes care of infections from soil and sett borne infections of inocula; once disease development from these inoculum sources is arrested, we can prevent build-up of sources of inoculum for secondary spread. However, under epidemic situations secondary infections do occur in a healthy crop, hence prophylactic sprays of the same fungicide 2 to 3 times



during May to July is suggested to protect the crop from infections and serious crop damages.

- A robust and dedicated seed replacement programme has to be taken especially in the red rot affected areas and the farmers have to be educated adequately to use quality and healthy seed. Encouragement has to be given for the development of entrepreneurship in the production and distribution of disease free and healthy seed cane to the farmers with a proper monitoring system.
- Farmers may also be advised to have seed cane nurseries with a close monitoring by the sugar mill personnel, for their own use. A separate field or area may be earmarked for raising a seed crop. The seed cane crop preferably be raised using single bud sett of apparently healthy canes. The single bud sett should be treated with a systemic fungicide like Thiophanate methyl (0.1%) in Seed Treatment Device before planting. Further, the nursery crop may be raised with *Trichoderma* culture fortified organic manures or vermicompost.
- Unscientific practices like applying bleaching powder in the field should be discouraged.

For further information pl contact

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