

SHORT COMMUNICATION

BIOSECURITY: AN OVERVIEW OF THE 2021/2022 SEASON

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Abstract

This biosecurity review characterises the South African sugarcane industry from a pest and disease perspective for the 2021/2022 milling season, and compares it to the previous seasons. The incidence of Eldana showed a general decline in most areas, compared to the previous seasons. Yellow sugarcane aphid infestations were also observably reduced in the Zululand, Midlands, South Coast and northern irrigated regions. Thrips trends remained stable, with population peaks from mid-October 2021 to mid-January 2022. The prevalence of white grub showed a decline, in comparison with the 2020/2021 season. The longhorn beetle surveys during this season were encouraging, with there being no damage, beetles or larvae detected. There was little change in the overall incidence and prevalence of smut in commercial fields, compared to the previous two seasons, and both were similar to the 5- and 10-year means. Mosaic levels remained extremely low in the industry. The incidence of ratoon stunt (RSD) was slightly higher than the 5- and 10-year means in commercial fields, with 5% of the submitted samples being infected. The disease was diagnosed in 0.6% of the intended seedcane sources. After the orange rust incursion in February 2022, it declined in May as the incidence of brown and tawny rust increased. The factors that are likely to have influenced the incidence and prevalence of the major pests and diseases will be discussed as well as strategies that have been adopted to counter these effects.

Keywords: sugarcane, pests, diseases, biosecurity, monitoring

Introduction

The South African sugarcane industry covers approximately 350 000 hectares, from southern KwaZulu-Natal to the Mpumalanga Lowveld (SASA Industry Affairs, 2021), and it encompasses a wide range of environmental conditions that favour the development of different pests and diseases. The industry is subdivided into Control Areas, as defined by the Local Pest, Disease and Variety Control Committees of the South African Sugar Association (SASA) (Stranack, 2021). The Sugar Act (Act 9 of 1978) and the Sugar Industry Agreement (2000), which make provision for the establishment of these Committees, provide a means of protecting the industry against the effects of pests and diseases through the routine monitoring of prospective seedcane sources and commercial fields.

This short communication highlights the main outcomes of the pest and disease surveys that were conducted during the 2021-22 season.

Methodology

Pest data

Surveys for *Eldana saccharina* (Lepidoptera: Pyralidae) (Eldana) were conducted industry-wide and covered 100,141 ha that are under cane. Infestation was quantified as the number of Eldana larvae per 100 stalks (e/100) for the different Control Areas over a 12-month period, from 1 June 2021 to 31 May 2022. The thrips and longhorn beetle surveys remain ongoing.

The presence and severity of the yellow sugarcane aphid was continually monitored during the season.

Disease data

The Biosecurity Inspectorate surveyed 8 773 commercial fields and 2 005 intended seedcane sources for smut, mosaic and off-types from 1 June 2021 to 31 May 2022. Inspections covered approximately 44 500 ha which represents 12% of the area under cane. A total of 7 408 RSD samples (5 053 commercial fields and 1 247 intended seedcane sources), were processed (Note: more than one sample may have been taken from large fields). The incidence of rust is monitored throughout the year and the latest orange rust observations are reported in this paper.

Results and Discussion

Pests

The 2021/2022 surveys showed a general industry decline in the incidence of Eldana, compared to the 2020/2021 season (Figure 1). The Zululand North, North Coast and South Coast regions experienced a decrease in infestation, compared to the 2020 and 2021 seasons, while other regions showed an increase in infestation, compared to the previous two seasons. The increase in these areas could be attributed to the extended carry-over of cane, which brings with it an increased risk of infestation in the older cane. However, the industry mean remained below the 5-year and 10-year levels and were also lower for the 2021/2022 season, compared to the previous seasons. A substantial improvement was noted in the grower response to Eldana management during this past season, particularly in the treatment of carry-over cane with insecticide programmes that were compliant with the IRAC (Insecticide Resistance Action Committee) recommendations. The sesamia levels remained insignificant throughout the 2021/2022 season for all regions, and the industry level remained below the 5-year and 10-year means.

The populations of sugarcane thrips during the 2022 surveys were consistent with the seasonal changes that were previously observed, with a peak from the end of October 2021 to mid-January 2022, followed by a lag from February-October 2022.

The results of the 2022 white grub surveys showed that *Schizonycha neglecta* was the prevailing species in sugarcane, particularly in the Midlands regions. The total number of captured grubs (249) and beetles (74) of *S. neglecta* was significantly lower than the number obtained during the 2021 season (406 grubs and 111 beetles).

YSA infestations during 2022 were observably lower in much of the industry, compared to the 2021 season. This was particularly evident in the Zululand, Umfolozi, Pongola and Lowveld regions. Growers exhibited greater due diligence, with early scouting and spot spraying. Furthermore, most regions experienced good rainfall, with the downstream benefit of a healthier crop.

The longhorn beetle surveys conducted in Entumeni during the 2021/2022 period yielded positive results, with no damage to the cane, and no beetles or larvae being detected in the containment area. However, caution should be exercised, and the industry is urged to remain vigilant. Surveys will continue during the 2023 season.

Diseases

There was little change in the overall incidence (% stools infected) and prevalence (% fields infected) of smut in commercial fields, compared to the previous two seasons (Figures 2a and b). Incidence was similar to the 5- and 10-year means, with 0.15% of the stools inspected being

infected (Figure 2a). Prevalence was equal to the 5-year mean, with 20% of the inspected fields being infected to some degree (Figure 2b).

As in previous seasons, the incidence of smut was highest in N19, N25 and N41 in the northern irrigated region. Good progress continues to be made in reducing its incidence in Mpumalanga. A decline in smut levels is expected over time in Pongola, with a moratorium on the planting of N41 currently in effect and the LPD&VCC Rules being enforced. Smut was most common in N54 and N59, in the Zululand area, and the disease was observed on a number of commonly-grown varieties in the Midlands, with incidence and prevalence being highest in N54.

Mosaic was rarely observed in the industry, with 1% of the surveyed fields being infected and a mean infection level of 0.004%. The disease was below the 5- and 10-year mean in all P&D areas. Varietal resistance has been key in maintaining these low mosaic levels in the industry.

The incidence of RSD in commercial fields was 4.6%, which is slightly higher than the 5- and 10-year means. The disease was diagnosed in 0.6% of the intended seedcane sources. In Pongola, 18% of the sampled fields tested positive, which is a substantial increase from the previous seasons. This may have been influenced by increased sampling during this period. No RSD was detected in the 72 seedcane samples submitted from the area, and with the newly-established seedcane scheme, levels are expected to decline over time.

After the orange rust incursion in February 2022, incidence declined in May 2022, as the incidence of brown and tawny rust increased. The good spring-early summer rains in 2022 favoured the development of orange rust, with new infections being reported from Umfolozi in early January 2023. The disease was observed for the first time since the initial incursion, in the Midlands (February 2023) and Mpumalanga (March 2023) and is now present in all P&D areas. Growers were advised to apply a registered fungicide to the problematic fields.

References

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- Stranack RA (2021). Review of the regularisation and centralisation of the biosecurity function in the South African sugar industry: 2015-2019. *Proc S Afr Sug Technol Ass* 93: 25-38.

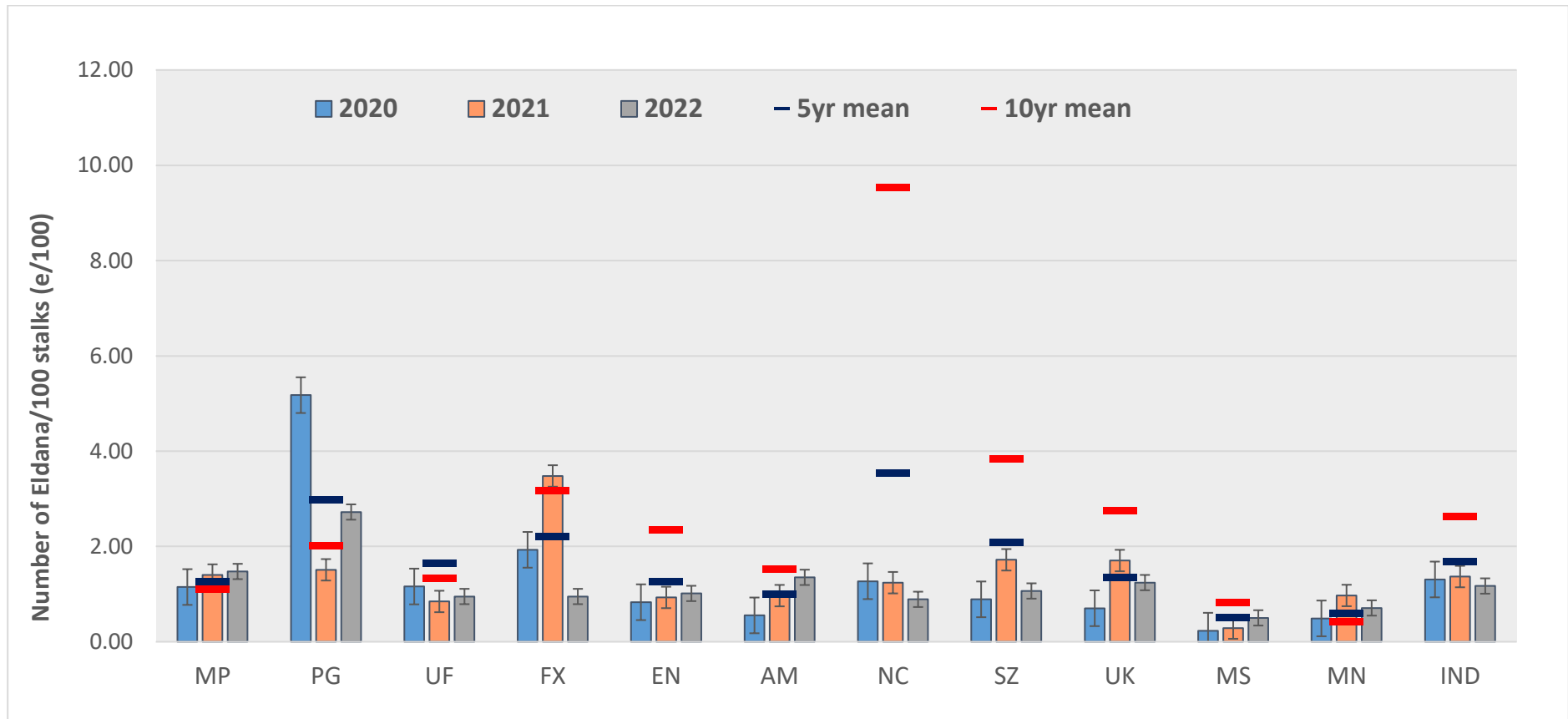


Figure 1. Eldana infestation for different pest and disease areas for the 2022 season. Pest and disease area abbreviations: MP = Mpumalanga; PG = Pongola; UF = Umfolozi; FX = Felixton; EN = Entumeni; AM = Amatikulu; NC = North Coast; SZ = Sezela; UK = uMzimkhulu; MS = Midlands South; MN = Midlands North; IND = Industry

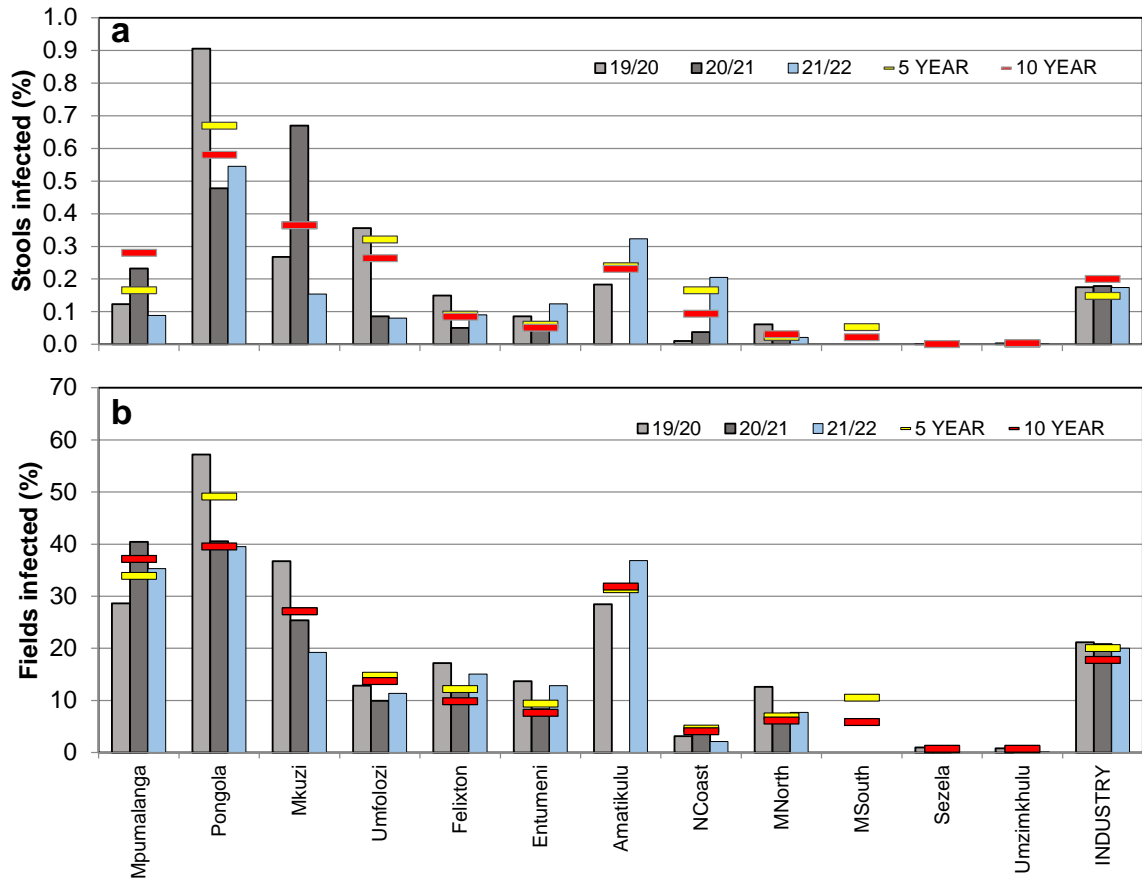


Figure 2. Smut (a) incidence and (b) prevalence in the South African sugarcane industry, June 2021 to May 2022 (commercial fields only)