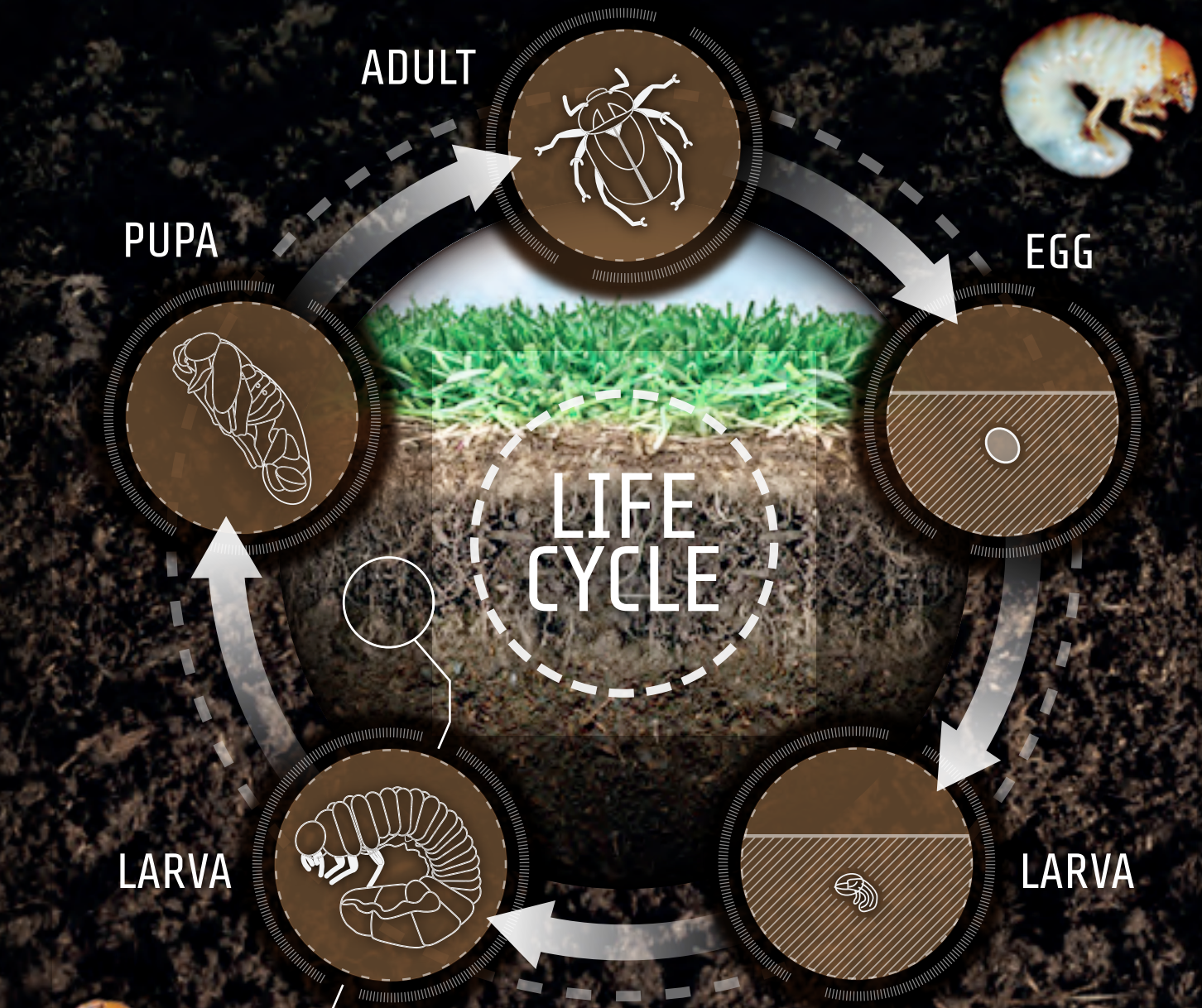


ACTION TO CONTROL WHITE GRUB DAMAGE IN TURF GRASS



syngenta®

SCARAB BEETLE SPECIES REPRODUCE BY EGGS LAID IN THE SOIL, WHICH HATCH INTO LARVAE, CALLED WHITE GRUBS. THE LARVAE GO THROUGH THREE MOULTS, OR INSTAR STAGES, WITH EACH MOULT GETTING PROGRESSIVELY LARGER AND MORE ROBUST. WHEN CONDITIONS ARE RIGHT, THE LARVAE PUPATE, AND THEN EMERGE AS ADULT BEETLES.



THE LARVAE FEED VORACIOUSLY ON ROOTS AND PLANT MATTER IN THE SOIL, WITH THE FASTER GROWING SPECIES – SUCH AS HETERONYCHUS LICAS AND MALADERA INSANABILIS – PARTICULARLY DAMAGING. WHITE GRUB ATTACKS CAN BE SPORADIC AND TRIGGERED BY A SUDDEN INCREASE IN LOCAL BEETLE POPULATIONS OR WEATHER CONDITIONS.

PEST MONITORING

White grub populations should be monitored regularly if there is suspected risk or history of attacks. Using a golf hole cup changer takes a sample equal to $\frac{1}{10}$ ft²; multiply x 10 for a grub count per ft². Take several samples for a representative average count.



GRUB COUNT	TURF GRASS EFFECTS
<6 per ft ²	Effects can generally be outgrown in good conditions
6-10 per ft ²	Damage can occur, particularly on susceptible grass species or under stressful conditions
10-20 per ft ²	Significant turf damage will occur
20-60 per ft ²	Rapid turf damage, particularly if second or third instar stages

Adult scarab beetle numbers can also be monitored with light traps. Recording the number of beetle captures once or twice a week will quickly build a picture of activity, including the time of peak emergence and predominant egg laying. Eggs typically hatch in 14 to 21 days; with optimum control timing three to four weeks after peak adult activity to best target young grubs.

ITM CONTROL MEASURES

MOISTURE MANAGEMENT

Dry soils during key points of the scarab beetle lifecycle – particularly the young larval stage – could reduce grub populations. However, turf quality can suffer in drought conditions.

Conversely, providing ample water and nutrients to keep turf growing strongly could enable plants to outgrow a low to moderate level of grub feeding damage.

CHEMICAL CONTROL

Chemical controls offer an effective route to minimise direct feeding effects of white grubs and, by reducing grub numbers, the subsequent damage from predators searching for food. Used as part of an Integrated Pest Management programme, Meridian and Acelepryn can protect plant health and playing surface quality.

OPTIMUM APPLICATION TIMING



BIOLOGICAL CONTROL

Several biological controls can reduce white grub populations, to a greater or lesser extent.



PARASITIC WASPS ATTACK WHITE GRUBS AND CAN EFFECTIVELY REDUCE NUMBERS WHERE THEY ARE PRESENT.

However, wasp numbers typically take several years to build up, by which time extensive damage may have occurred. Furthermore, while the risk of people being stung by these large wasp species is low, their presence on the course is unwelcome for golfers.

White grubs are fatally susceptible to certain *Phanibacillus* bacterium. It has been possible to cultivate specific strains of the bacterium, to apply directly to the turf and target white grubs. However, three to five years of repeated application has been required to build up levels in the soil and, even then, the pathogen is relatively weak with infection rates no more than 25%.

Artificial application of different parasitic nematodes have been shown to be effective against white grubs. Results with the different nematode species have been variable; generally less than 50%, but up to 80% with others. Parasitic nematodes do not appear to be effective from one year to the next and need to be reapplied each season.

NEW-R&D TOPIC

New Syngenta research is looking at the potential beneficial effects of Qualibra wetting agent programmes to maintain a firm, dry surface that is unfavourable to grubs and better for play, while also retaining moisture deeper and evenly in the soil profile that can improve root development and promote turf health that is better able to withstand grub feeding damage.

KEY ACTIONS:

TARGET WHITE GRUB AT THE EARLIEST LIFE-CYCLE STAGES

All chemical controls are most effective on smaller larvae – resulting in a faster and more complete kill. Rapid kill minimises the extent of feeding damage. Results on larger, second and third instar stages are progressively slower and with reduced overall efficacy. In this situation Meridian would be the product of choice.

Routine preventative applications are not recommended. However, where monitoring has revealed activity of adult beetles, or previous history of grub damage, the use of a longer lasting residual insecticide, such as Meridian or Acelepryn – timed to coincide with peak egg hatch and early grub activity – could be justified.

APPLICATION CONDITIONS

Best results will be achieved when grub activity is near the soil surface and in contact with the applied insecticide. Irrigation prior to, and soon after application, will optimise grub activity in the target zone.



Deep thatch, over 25mm, can interfere with the movement of insecticide active into the target zone. Removing any build-up of thatch will reduce conditions conducive to grub activity, and improve the performance of insecticide treatments.

Application using the Syngenta XC 08 Nozzle will deliver optimum water volume for spray treatment to reach the target zone, typically 600 to 800 l/ha. The ultra-low drift nozzle design will also ensure minimal risk of spray drift and maximum product retention in the treatment target zone.

WHITE GRUBS OCCUR EXTENSIVELY ACROSS THE UAE REGION AND CAN RESULT IN DEVASTATING DAMAGE TO GOLF COURSE PLAYING SURFACES

DIRECT FEEDING ACTIVITY ON PLANT ROOTS AFFECTING TURF HEALTH AND DIE BACK OF LARGE PATCHES

INDIRECT FEEDING OF BIRDS AND ANIMALS ON GRUBS CAUSES WIDESPREAD DAMAGE



ROOT DAMAGE BY WHITE GRUBS



REDUCED TURF VIGOUR
Less efficient use of water & nutrients + greater susceptibility to stress & disease

White grubs are the larval stages of a wide range of scarab beetle species. In the region's ideal conditions, some species may have more than one generation in a single season, while others may take two or more years to go through their lifecycle – which pose different challenges for superintendents.

The white grubs feed on thatch, roots, stolons and crowns of turf plants. The irrigated conditions and density of nurtured golf course turf typically provides the ideal environment for white grub development.

HIGH RISK FACTORS FOR WHITE GRUB INFESTATION:



PREVIOUS HISTORY OF WHITE GRUB DAMAGE

SAMPLING CATCHES OF ADULT BEETLE ACTIVITY

MOIST SOILS

THATCH

SUNNY AREAS



KEY ACTIONS:

ROTATE INSECTICIDE ACTIVITY

There is some evidence of reduced activity of some insecticides that have been used repeatedly on the same area of a golf course – typically experienced as shorter duration of residual effects. This has been attributed to enhanced microbial degradation of the product applied by certain soil fungi.

To minimise the risk of this developing, superintendents should regularly select products with different modes of action – not just a different product name from the same group of chemicals – for alternate applications; e.g. Meridian from the neonicotinoid group followed by Acelepryn, a chlorantraniliprole active.

MONITOR GRUB ACTIVITY

Many of today's insecticides offer far greater residual activity, compared to old organophosphate or carbamate options. Meridian typically provides four to eight weeks' control of early grubs, with Acelepryn even longer when applied prior to egg hatch.

However, treated areas should continue to be monitored for grub activity after application, to counter prolonged egg hatch or grubs moving through the soil profile. Remember, larger third instar grubs may take longer to die after treatment.

It may be possible that more than one scarab beetle species could have been active in the area – resulting in a prolonged infestation of white grub, or successive flushes of egg hatches through the season.

Grub monitoring can be focussed on key areas where grub activity has been seen in the past, or high risk areas. Frequently grub activity is most prevalent on turf close to cultivated flower borders, sunny banks or areas that remain permanently moist.

KEY ACTIONS TO CONTROL WHITE GRUBS

✓ MONITOR ADULT BEETLE FLIGHTS – PEAK EGG HATCH OCCURS ABOUT A MONTH LATER

✓ USE CUP CUTTER TO SAMPLE FOR WHITE GRUBS – PULL PLUG, INSPECT, RECORD NUMBERS AND REPLACE

✓ SELECT HIGH RISK AREAS FOR PRIORITY TREATMENT

✓ SELECT APPROPRIATE CONTROLS AND APPLY ACCURATELY AT THE OPTIMUM TIME



DID YOU KNOW:

Areas previously damaged by grub, are at an 80% risk of repeat damage! In this case apply Acelepryn as an early preventive (10 weeks before you expect white grub egg hatch).