herbicide or growth regulator while the neighboring biotype is unaffected. As a winter annual, most annual bluegrass seed will germinate in fall. Thus, PREs applied for annual bluegrass control should be applied in late summer.

Previous research at Cornell University and our current research on creeping bentgrass, Kentucky bluegrass and/or perennial ryegrass fairways clearly show that including a late summer application of a PRE in combination with a program of POST herbicides improves annual bluegrass control over the POST program alone. If the PRE is not included, the tremendous bank of annual bluegrass seed in the soil will germinate all fall and quickly reoccupy any of the openings left by annual bluegrass controlled by the POST applications.

Using multiple modes of action in an annual bluegrass control program also can minimize the chances of developing a population resistant to a single mode of action approach.

During summers like 2011 or 2012, turf stands of desired turf and/or annual bluegrass thin and die. The immediate response is to interseed the desired turf, but annual bluegrass germinates at the same time and starts to out-compete the desired turf again (Figure 3).

Options for using PREs in overseeding are limited to applications after the seedlings have matured. Initial research results at UNL investigating the use of PREs applied prior to seeding to control the annual bluegrass between the overseeder slits and preliminary results are surprisingly positive. Our other research, partly funded by the USGA, is evaluating POSTs applied shortly after emergence of the desired turf to help minimize annual bluegrass. Simply overseeding into thin turf without aggressive annual bluegrass control will continue the cycle of annual bluegrass infesting the stand.

PHOTO COURTESY: ZAC REICHER

FIGURE 3

After summer thinning of fairways containing annual bluegrass, overseeding desired turf (the dark green lines of perennial ryegrass in this case) is done to improve playability. However, annual bluegrass germinates quickly in the fall, re-occupying bare areas and likely out-competing the desired turf over the winter. Current research is evaluating the aggressive use of pre- and/or post-emergent herbicides to limit annual bluegrass reinfestation. Preliminary results are promising.

YELLOW NUTSEDGE CONTROL

Yellow nutsedge has long been controlled with POST applications, but PRE control has been documented from both Echelon (prodiamine plus sulfentrazone) and Tenacity. Applications of Echelon to established turf need to be at the typical PRE application timing for crabgrass of mid-spring and are most effective with sequential applications.

Tenacity can control yellow nutsedge PRE in a new seeding on bare soils. Though neither of these products provide 100 percent control of yellow nutsedge every time, their typical 70 to 90 percent control is far better than we ever expected from previous PRE applications.

Though few major changes have occurred in pre-emergent herbicides over the last 20 years, researchers continue to advance our understanding of these products, resulting in improved weed control and expanded uses in golf turf.

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