

NUTSEDGE ECOLOGY IN PLASTICULTURE AFFECTS WEED MANAGEMENT

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Purple nutsedge (*Cyperus rotundus*) and yellow nutsedge (*Cyperus esculentus*) are exotic invasive weeds that have become naturalized within the US. As early as 1939, uncontrolled purple nutsedge encroachment caused growers to abandon agricultural land (Godfrey 1939). Nutsedges are currently the most troublesome weeds of vegetable crops in the southeast US (Webster 2006). Tubers, the primary means of nutsedge reproduction, begin to form about six to eight weeks after foliar emergence, synchronized with early flowering (Hauser 1962). Effective management strategies must suppress nutsedge foliar growth and reduce tuber production. Polyethylene mulch is an effective barrier for most weeds; however, nutsedges readily pierce polyethylene mulch.

Greenhouse studies were conducted to evaluate the influence of mulch type on shoot and tuber production. Treatments included two mulches (black and clear/colorless), each 1.25 mil, and a non-mulched control. In each mulch treatment, a single purple nutsedge or yellow nutsedge tuber was planted and monitored for 16 weeks.

Field studies were conducted to evaluate the influence of black and clear mulch, relative to non-mulched control, on nutsedge growth and patch expansion over a growing season. A single nutsedge tuber was placed in the middle of each plot and growth monitored for 24 and 60 weeks for yellow nutsedge and purple nutsedge, respectively.

In the greenhouse study, yellow nutsedge produced nine-times more shoots and seven-times more tubers than purple nutsedge in the absence of mulch. While yellow nutsedge growth was significantly greater than purple nutsedge in the absence of mulch, yellow nutsedge was less able to penetrate and thrive in the mulched systems. Black mulch reduced yellow nutsedge shoot numbers 96% and tuber numbers 50%. There was no detectable affect of mulch on purple nutsedge shoot or tuber population density. More detailed information concerning this study is available (Webster 2005a).

In the field study, purple nutsedge growth was promoted by black mulch. At 32 and 60 weeks after tuber planting, purple nutsedge shoot population density and patch area in the black mulch treatments were more than double those in the non-mulched control. In contrast, yellow nutsedge growth was suppressed by black mulch. At 16 and 24 weeks after planting, yellow nutsedge in the black mulch

had three-times fewer shoots and two-times less patch area than in the non-mulched control. More detail concerning this study is available (Webster 2005b).

The use of black mulch may alter environmental characteristics of the cropping system, potentially extending the growing season for purple nutsedge by moderating the cool late-autumn temperatures and warming the soil in late-winter earlier than in the non-mulched plots. Future studies should investigate the influence of various mulch types (i.e. LDPE vs. VIF) and mulch colors (i.e. red vs. silver vs. white vs. black) on soil heating, light transmission, and ultimately nutsedge growth.

Literature Cited

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