Flame Weeding

In 1998, New Melleray Abbey farm manager Joe Fitzgerald conducted the first formal trial of flame weeding in corn. Flame weeder use jets from a propane tank to burn down weeds similar to burn-down herbicides but use propane instead of chemicals. Flamed weeds are killed by the cell membranes rupturing, when exposed to temperatures of 100°C for a split second. The cell then loses water and the plant dies. Also flaming could occur when the soil is too wet for mechanical cultivation. Flame weeding is most effective when leaves are thin and tender and the weed’s growing point is above the soil surface. Although flame weeding’s effect on weeds was not significantly different in 1998, Joe tested the flame weeder again in 1999. Corn yield was significantly improved and fewer broadleaf and grass weeds were present compared to the cultivation treatment. flaming was more expensive, but because of better weed control and higher crop yields it was the more profitable treatment.

In 1999, Dennis and Eve Abbas flame- weeded on July 1. Dennis observed reductions in weeds, including quack grass and Canada thistle. Again in 2000 he compared flaming before first cultivation vs. flaming after first cultivation and again after second cultivation. The first, flame-woeding before first cultivation, only significantly out-yielded corn compared to the second treatment - but weed pressure was relatively low that year.

In 2000 Gary Guthrie tested weed control in carrots using flame-weeding at an early and later carrot planting date. Broadleaves and grasses were reduced more in the later planting date treatment. The flaming saved on labor and materials at about $1.30 per 100-foot bed. Building on flame-weeding research, Doug Aiert and Margaret Grapton flame-weeded and twice cultivated their ridge-tilled corn. They measured reduced velvetleaf populations and increased corn yields compared to two cultivation passes only. In 2002 Paul Mugge controlled weeds with a combination of flame weeding and cover crops. Paul measured reduced numbers of broadleaf weeds from either a spring rye cover crop planted on the ridges or a flame-cultivation only. The biggest reduction in weeds came from the combination of cover crops and flame weeding.

Rye on the Ridges

Several farmers have tried planting rye on the “ridges” to control weeds. To plant on the ridges PFI farmers developed the technique of plugging units on the New Melleray Abbey farm. The technique of plugging units on the New Melleray Abbey farm. Although flame weeding’s effect on weeds was not significantly different in 1998, Joe tested the flame weeder again in 1999. Corn yield was significantly improved and fewer broadleaf and grass weeds were present compared to the cultivation treatment. flaming was more expensive, but because of better weed control and higher crop yields it was the more profitable treatment.

As one of the early participants in PFI flame-weeding trials, Paul Mugge started experimenting with flame weeding in 2002.

In 2010 Aaron Lehman planted a winter rye cover crop in the fall prior to soybeans and then in the spring mowed the rye cover crop near boot stage. He then was able to use the mulch from the cover crop to suppress weeds in his organic soybeans. He observed reduced weed pressure and tried the test again in 2011.

2012 Flame-Weeding Field Days

A new idea to be explored at an upcoming PFI field day, on August 7 in Stanton, is the use of flame weeding for no-till farmers who have glyphosate-resistant weeds on their farm. Mark Grapton is the research technician, along with Dr. Steven Knezovic from the University of Nebraska, will present about the potential for flame weeding in conventional no-till systems. Also check out the new flame- weeder Scott Shriver uses for organic weed management on September 13th near Jefferson at his field day. See the PFI field day guide for more information.

Have ideas for on-farm weed management research projects? Contact Sarah Carlson at 515.232.5661 or sarah@practicalfarmers.org.

Field Crops Management Strategies

by Sarah Carlson

PFI Cooperators have been conducting on-farm research trials on weeds every year since 1987, when the PFI Cooperators’ Program began. Now is a good time to review that research, because numerous hot days in this year’s growing season were valued at $35.00 per acre. The cost of ridge-till with and without banded and mulch treatment while lambsquarters was reduced $8.78 per acre in production costs.

Flame Weeding vs Ridge-Tillage

In 1988 Ron Rossmann, one of nine cooperators conducting weed management trials that year, measured increased weeds in conventional tilled versus ridge-tilled fields. More velvetleaf and pigweed were present in the conventional tillage treatment while lambsquarters was greater in the ridge-tillage treatment. At other locations – Dordt College and the farms of Harlan and Sharon Grass, Ray and Marj Stonecypher, Bob and Diane Graff, Allyn and Laura Hagensick, Tom and Marcia Marj Stonecypher, Bob and Diane Graff, Allyn and Laura Hagensick, Tom and Marcia Hanks, Todd and Linda Hartack, and Mark and Rita Mays — side-by-side comparisons of ridge-till with and without banded herbicides showed no corn yield differences in three locations and saved an average $8.78 per acre in production costs.

Ridge-till with and without herbicide soybean trials at five of six locations showed no yield differences. At the sixth location (the Hanks’), soybean yield without herbicides was reduced by 5.23 bushels per acre, which in 1988 was valued at $35.00 per acre. The cost of the herbicide at the time was $24.03 per acre. Farmers used a mixture of herbicides to control weeds, including rotary hoeing and cultivating in addition to comparing with and without herbicides.

Low-Input, Mechanical Control Trials

In 1990 low-input weed treatments were compared to higher input treatments by 14 PFI Cooperators. Ten out of 11 trials using ridge-tillage without herbicides showed no difference in corn or soybean yield to a chemical comparison. In 1992, Cooperator Paul Mugge compared yield and production costs of mechanical treatment while lambsquarters was reduced 8.78 per acre in production costs.

Rye on the Ridges

Several farmers have tried planting rye on the “ridges” to control weeds. To plant on the ridges PFI farmers developed the technique of plugging units on the New Melleray Abbey farm. Although flame weeding’s effect on weeds was not significantly different in 1998, Joe tested the flame weeder again in 1999. Corn yield was significantly improved and fewer broadleaf and grass weeds were present compared to the cultivation treatment. flaming was more expensive, but because of better weed control and higher crop yields it was the more profitable treatment.

As one of the early participants in PFI flame-weeding trials, Paul Mugge started experimenting with flame weeding in 2002.

2012 Flame-Weeding Field Days

A new idea to be explored at an upcoming PFI field day, on August 7 in Stanton, is the use of flame weeding for no-till farmers who have glyphosate-resistant weeds on their farm. Mark Grapton is the research technician, along with Dr. Steven Knezovic from the University of Nebraska, will present about the potential for flame weeding in conventional no-till systems. Also check out the new flame-weeder Scott Shriver uses for organic weed management on September 13th near Jefferson at his field day. See the PFI field day guide for more information.

Have ideas for on-farm weed management research projects? Contact Sarah Carlson at 515.232.5661 or sarah@practicalfarmers.org.

Field Crops Management Strategies

by Sarah Carlson

PFI Cooperators have been conducting on-farm research trials on weeds every year since 1987, when the PFI Cooperators’ Program began. Now is a good time to review that research, because numerous hot days in this year’s growing season were valued at $35.00 per acre. The cost of ridge-till with and without banded and mulch treatment while lambsquarters was reduced $8.78 per acre in production costs.

Flame Weeding vs Ridge-Tillage

In 1988 Ron Rossmann, one of nine cooperators conducting weed management trials that year, measured increased weeds in conventional tilled versus ridge-tilled fields. More velvetleaf and pigweed were present in the conventional tillage treatment while lambsquarters was greater in the ridge-tillage treatment. At other locations – Dordt College and the farms of Harlan and Sharon Grass, Ray and Marj Stonecypher, Bob and Diane Graff, Allyn and Laura Hagensick, Tom and Marcia Marj Stonecypher, Bob and Diane Graff, Allyn and Laura Hagensick, Tom and Marcia Hanks, Todd and Linda Hartack, and Mark and Rita Mays — side-by-side comparisons of ridge-till with and without banded herbicides showed no corn yield differences in three locations and saved an average $8.78 per acre in production costs.

Ridge-till with and without herbicide soybean trials at five of six locations showed no yield differences. At the sixth location (the Hanks’), soybean yield without herbicides was reduced by 5.23 bushels per acre, which in 1988 was valued at $35.00 per acre. The cost of the herbicide at the time was $24.03 per acre. Farmers used a mixture of herbicides to control weeds, including rotary hoeing and cultivating in addition to comparing with and without herbicides.

Low-Input, Mechanical Control Trials

In 1990 low-input weed treatments were compared to higher input treatments by 14 PFI Cooperators. Ten out of 11 trials using ridge-tillage without herbicides showed no difference in corn or soybean yield to a chemical comparison. In 1992, Cooperator Paul Mugge compared yield and production costs of mechanical treatment while lambsquarters was reduced 8.78 per acre in production costs.

Rye on the Ridges

Several farmers have tried planting rye on the “ridges” to control weeds. To plant on the ridges PFI farmers developed the technique of plugging units on the New Melleray Abbey farm. Although flame weeding’s effect on weeds was not significantly different in 1998, Joe tested the flame weeder again in 1999. Corn yield was significantly improved and fewer broadleaf and grass weeds were present compared to the cultivation treatment. flaming was more expensive, but because of better weed control and higher crop yields it was the more profitable treatment.

As one of the early participants in PFI flame-weeding trials, Paul Mugge started experimenting with flame weeding in 2002.

2012 Flame-Weeding Field Days

A new idea to be explored at an upcoming PFI field day, on August 7 in Stanton, is the use of flame weeding for no-till farmers who have glyphosate-resistant weeds on their farm. Mark Grapton is the research technician, along with Dr. Steven Knezovic from the University of Nebraska, will present about the potential for flame weeding in conventional no-till systems. Also check out the new flame-weeder Scott Shriver uses for organic weed management on September 13th near Jefferson at his field day. See the PFI field day guide for more information.

Have ideas for on-farm weed management research projects? Contact Sarah Carlson at 515.232.5661 or sarah@practicalfarmers.org.