



Photo 0028 First field stop of tour, Oats cover crop on reclaimed field planted in spring of 2019 was very irregular in plant vigor. The reason was not apparent. Very vigorous oat plants were growing in areas of weak oat plants. View ~ west.



Photo 0029 First field. A water erosion rill cut is visible across the lower third of the image. View ~ north. Irregular growth of oat cover crop is apparent.



Photo 0030 First field, view ~ southeast.



Photo 0031 First field, western part. Photo taken at boundary of two different seeding periods. The oat cover crop on right is bearing seed; oat cover crop at left did not head out.



Photo 0032 First field, view ~ north-northeast. The oat cover crop varied greatly in vigor. Oat plants were only growing in one set of drill rows, indicating the difference was not due to different seeding dates. Both the low-vigor plants and the high-vigor plants bore seeds.



Photo 0033 Photo was taken west of the immature oat cover crop visible in Photo 0031. The flat, graded surface was SPGM subsoil. Rough-looking area in upper left corner is overburden. View north.



Photo 0034 Photo was taken in the same area as # 0033, but further west on the graded SPGM subsoil. Overburden is at right. View south.



Photo 0035 Photo was taken in the same area as # 0034, at SPGM subsoil toe-slope. Overburden is at left. View north.



Photo 0036 Another water erosion rill in the first field. Irregular cover crop vigor apparent in background – patches and individual plants. View ~ west.



Photo 0037 Bruce Johnson? Looking at a water erosion rill slightly north of the rill in # 0036. Irregular cover crop vigor is again apparent. View ~ west.



Photo 0038 Close-up photo of oat plants with strongly contrasting vigor. There was only one set of drill rows. Both the low-vigor plants and the high-vigor plants bore seeds.



Photo 0039 Low-vigor oat plant had a much smaller root ball than the high-vigor oat plant. Samples were from the first field on the tour.



Photo 0040 The plants on the ground are the same two plants shown in Photo 0039.



Photo 0041 There was a strip in the field oriented ~ east-west that had noticeably lower vigor than adjacent areas. A few robust plants were scattered within the strip, but almost no patches of high vigor oat plants.



Photo 0042 A draw or water course had some cover crop growth on the overburden surface. Some water erosion had occurred. Precipitation during September was much above average. View ~ west.



Photos 1050 and 1051 Volunteer growth on the second field. Don ? said it was mulched in the fall of 2018 and weeds were clipped in 2019. Don ? said the field was supposed to be sprayed for weed control this fall but the contractor had not showed up yet.



Photo 1051. The predominant species on the field were Russian thistle (*Salsola sp.*), sweetclover (*Melilotus officinalis*) and pigeongrass (*Setaria sp.*). Bushy knotweed (*Polygonum ramosissimum*) was also common.



Photo 1053. Barnyard grass (*Echinochloa sp.*) was abundant on part of the field. Some Kentucky bluegrass plants and a few native forb and grass plants, dandelions, thistles, and common cocklebur were also noted.



Photo 1052. Photo of a thistle plant (possibly musk thistle) on the second field.

The weed seed bank produced on the second field in 2019 is undoubtedly immense and would pose severe competition to a grass seeding attempt in 2020 and perhaps later years, too. It would have been far more preferable to plant a benign cover crop such as oats to suppress weeds and then utilize herbicide control to prevent the weed seed production. WPC recommends at least two years of cover crop plantings and weed control with herbicides to reduce the weed seed bank prior to attempting the permanent grass seeding.

An early-spring cover crop of glyphosate-tolerant canola in 2020 could create macropores in the soil and allow broad-spectrum weed control. The canola cover crop could be terminated with another herbicide in the summer before seed matures and allow a second cover crop such as winter wheat to be planted in late summer or early fall. The winter wheat could be terminated with a broad-spectrum herbicide in the boot stage in 2021, followed by another cover crop planted for weed suppression, erosion control and soil structure improvement.

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