Project Title: Evaluation of spring cereal grain yield to over-seeding on soil injected with tractor exhaust.

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Objective:
Evaluate if injecting diesel tractor exhaust in to the soil, along with wheat seed would enhance grain yield.

Results:
This trial was set up on both winter wheat and spring wheat. A farm scale exhaust injection system was used to establish wheat adjacent passes in fields of winter wheat and spring wheat. The first seeding pass was done without injecting the exhaust. The idea was to not have any fresh exhaust residues in the system when seeding the untreated check pass. The second pass was made with the exhaust injector system in operation. No start up fertilizer was placed with the seed. The moisture from the exhaust causes the granular fertilizer pearls to gum and build up on the opener. Therefore no starter fertilizer (NPK or S) was placed with the seed. Liquid N was applied sequential applications of 4 gallons per acre of 28-0-0 (11.2 lbs N)and 5 gallons of 24-0-0-0 (12.0 lbs N).

No visually apparent response was exhibited by either the winter wheat or spring wheat seedings. No winter wheat yield increase or protein enhancement occurred in response to the injection of the diesel exhaust into the soil with the seed (Table 1). The spring wheat crop was marginal due to a late seeding date. Further, no visual indication of response it was decided to not harvest the any yield samples.

Any further efforts to evaluate the yield benefits with exhaust injection should include treatments that would provide a fertilizer source of P and N within both main effects treatments, with and without exhaust.

Summary:
This initial evaluation of injecting diesel exhaust into the soil along side the seed did not result in any positive results.

Funding Summary:
Expenditure information to be provided by OSP.
No other grant support was provided for this project.

MWBC FY2011 Grant Submission Plans:
It is has not been decided whether to pursue this investigation further at this time.
With and with out exhaust field passes were established in the fall of 2010, in case we did want to further investigate this cropping practice.

Table 1 Initial evaluation of the effect of tractor exhaust on fall seeded winter wheat.
Exp: Smoke38 Central Agricultural Research Center. Moccasin, Montana.

Plot	Treatment	Plant Height	Plot Weight plot wt	Grain Yield	1000 Kernels	Grain Protein
		cm	g/2m	bu/a	g	%
101	No exhaust	80	166	44.3	32.1	7.8
102	exhaust	78	161	42.9	30.7	6.7
201	No exhaust	82	198	52.8	36.3	7.9
202	exhaust	80	163	43.5	27.9	7.4
301	No exhaust	78	175	46.7	27.6	7.2
302	exhaust	79	182	48.5	29.2	7.2
		Means				
	No Exhaust	80.0	191.7	47.9	32.0	7.6
	Exhaust	79.0	170.0	44.9	29.3	7.1
		79.5	180.8	48.2	30.6	7.4

Trial was established near Ware, Montana in November 2009
No fertilizer was placed with the seed as the exhuast moisture cause build up on opener.
Supplemental fertilizer was applied top dress via liquid fertilizer.
Tank mix application of with herbicides (11.2 lbs N) and additional application (12 lbs N).
Harvest samples were collected on the 5 & 6th row in from the end of adjacent drill passes at three 100 yd intervals.