Testing and Comparing the Emissions of a Small Engine Running on Ethanol Versus Gasoline

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Gasoline-fueled small engines have been known to cause immense pollution in the form of nitrogen dioxide, nitric oxide, unburnt hydrocarbons, sulfur dioxide, and carbon monoxide. Ethanol has been blended with gasoline to clean up emissions in cars although there is some debate over its effectiveness in those engines. To date, no study has tested the same small engine on 100% gasoline and compared it to 100% ethanol. It was theorized that 100% ethanol is effective at cleaning up small engine emissions. To test the emissions mentioned above a Testo 350 engine kit emissions analyzer was used. The machine being tested was a push lawn mower with a 6.5hp engine. 10 total tests were conducted 5 tests were conducted on gasoline and 5 on 100% ethanol. The analyzer's pitot tube was inserted into the muffler of the lawn mower at the 1, 2 ½, and 5-minute mark for 30 seconds. The analyzer produced a measurement for each gas every second for a total of 30 measurements the 30 measurements were then averaged into one number. This data was then compiled into graphs showing the difference between the emissions of gasoline and ethanol over time. The most drastic reduction of pollution was in sulfur dioxide as when run on ethanol the engine produced 96% less sulfur dioxide and 1/10 of the carbon monoxide gasoline produced. The data revealed that 100% ethanol is an effective means of reducing pollution in small engine exhaust.

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