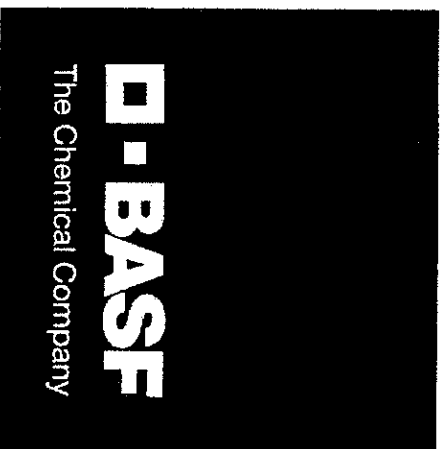


BADER FARMS ET AL. V. MONSANTO ET AL.  
**EXHIBIT**  
**PLTF-1145**

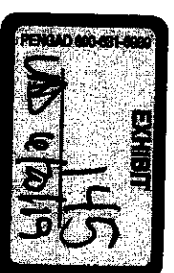
# Dicamba

Dicamba Tolerant Crop Uses



Jeff Birk and Scott Jackson  
North America Annual Regulatory Conference 2013  
Doubletree at Hilton Hotel, RTP, NC  
June 4 – 6, 2013

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## Dicamba Product Registrations

### Pending and Planned in the US

- MON1691, (Clarity equivalent)
- Engenia herbicide, (BAPMA salt of dicamba)
- MON100111, (Engenia equivalent for DT uses only)
- MON1750, (Clarity + glyphosate premix)
  - conventional crop uses approved 2-14-13
- Monsanto will submit for Clarity + glyphosate premix use on DT soybean after trait deregulation
- Monsanto will submit for Engenia + glyphosate premix after Engenia registration

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# USDA Environmental Impact Statement

## New Challenges and Opportunities

- USDA could not conclude from their environmental assessment (EA) that there would be no significant impact from the deregulation of DT soybean and cotton
  - ➔ Triggers USDA to develop an *Environmental Impact Statement* (EIS)
- USDA is required to provide a work plan for the EIS
  - Expected to be available for review in June 2013
  - Will provide a better indication of expected timelines for completion

**DT soybean and cotton trait deregulation expected mid-2015 or later**

# USDA Environmental Impact Statement

## New Challenges and Opportunities

- **USDA will rely on EPA resources in developing the EIS**
  - BASF will cooperate with EPA to provide relevant information
  - In keeping with the close regulatory cooperation on this project, BASF has reaffirmed our commitment to Monsanto to provide regulatory support and expertise to the EIS process, as needed
- **BASF will encourage EPA to continue the registration process for Engenia™ herbicide and the proposed DT soybean use during the EIS process.**

# Off Target Movement Concerns

## Physical Drift and Volatility

- EPA continues to be concerned about the potential for off target movement of dicamba.
- BASF has taken proactive measures to address this concern:
  - Developed proposed label restrictions to minimize off target movement.
  - Provided data to EPA documenting the low volatility of dicamba.
  - Developed a proximity tool to help applicators identify buffer requirements and sensitive areas.
- MON has conducted non-guideline field crop response studies to document dicamba drift
- MON has conducted non-guideline field flux studies to quantify dicamba volatility.

# New Dicamba Crop Residue Studies

## Dicamba residues resulting from spray drift

- New dicamba crop residue studies are being initiated in 2013 to allow for the setting of dicamba residue tolerances in over 200 crops.
  - Preharvest use scenarios
  - Defensive strategy to establish dicamba residues in the event of off-target drift
- The first new crop tolerances are expected to be established in 2015 with the remaining tolerances established in 2016.
  - Priorities set based on crop value, importance and occurrence
- The tolerances are expected to allow for the harvest and sales of fruit, nut and vegetable crops that may be exposed to dicamba spray drift.
  - Studies are not designed to support export markets

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## **EPA/USDA Field Day**

**University of Maryland, Beltsville, MD Research Station**

- **BASF will be hosting a field day for EPA/USDA to demonstrate**
  - Herbicide resistant weeds – population development and management
  - Spray drift - causes and management, including latest advances in nozzle technology
  - Strategies for advancing applicator education and product stewardship programs, including use of proximity tools for improved sensitive area and crop awareness
- **EPA attendance is expected from Product Management teams, EFED, BEAD and HED.**

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## **New Dicamba Technical Source**

**For Use In US Products Only**

- To address short and intermediate term demand for dicamba technical, Yangnong (China) has been identified as a possible new source.
- Negotiations with Yangnong are ongoing to secure the source for BASF
  - Yangnong will add new capacity 3Q13.
- Current Chinese dicamba production capacity is sold out.
- A US registration strategy has been outlined that will meet the expected increase in dicamba technical demand by 1Q15.
  - Currently evaluating the opportunity to register this source in other regions.

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# Making the Most of the Available Time

## EIS Delay = Opportunity

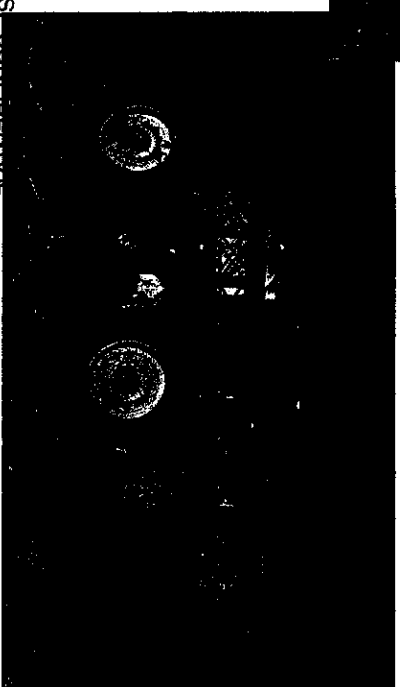
- Alleviate anticipated supply issues with new EPA approved dicamba source in 2015.
- Manage inadvertent residues from spray drift with EPA approved non-target crop residue tolerances in 2015/2016
- Develop tank mix additive or other improvements for the Engenia herbicide system
- Additional DT soybean varieties/acreage will be available as well as DGT cotton

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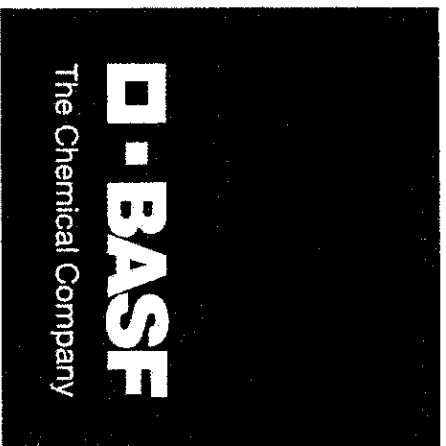
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# Development of Ground Spray Deposition Data for Determination of Buffers – '2012



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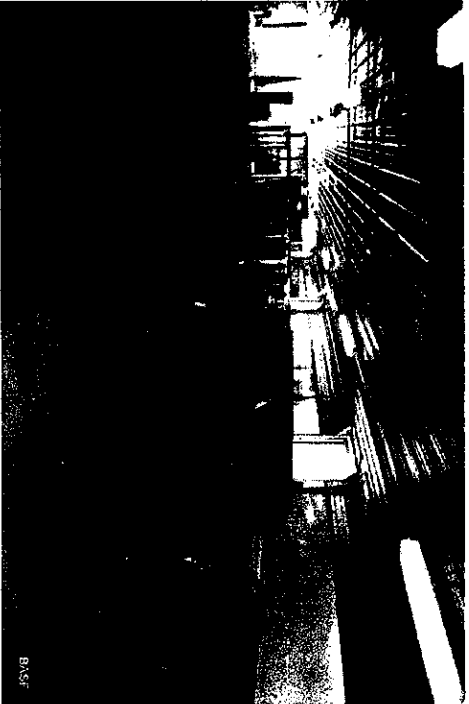


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# Spray Buffer Improvements How do We Get These Improvements?

- There are 2 paths ...

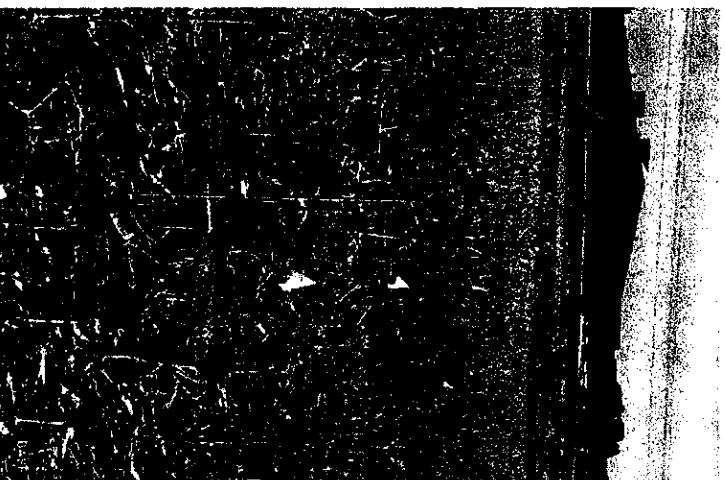
Wind Tunnel



Or

**We did both !!**

Field Trial



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# Study Treatments

## 3 Tank Mixes, 3 Nozzles, 2 Wind Speeds

- A) Wind Target 3-5 mph
- B) Wind Target 10-15 mph

Table 1. Study Treatments

Treatment	Formulation	Rate (lb/ac)	Nozzle	Carrier Volume (gpa)	Travel Speed (mph)
1	Clarity <sup>1</sup>	1	XR 8004	10	10
2	Clarity <sup>1</sup>	1	TTI 11004	10	10
3	Clarity <sup>1</sup>	1	AIXR 11004	10	10
4	BAS 183 22 H <sup>1</sup>	1	XR 8004	10	10
5	BAS 183 22 H <sup>1</sup>	1	TTI 11004	10	10
6	BAS 183 22 H <sup>1</sup>	1	AIXR 11004	10	10
7	BAS 183 22 H <sup>1&amp;2</sup>	1	XR 8004	10	10
8	BAS 183 22 H <sup>1&amp;2</sup>	1	TTI 11004	10	10
9	BAS 183 22 H <sup>1&amp;2</sup>	1	AIXR 11004	10	10

<sup>1</sup> Induce (NIS) @ 0.25%v/v  
<sup>2</sup> PowerMax 540SL @ 1 lb ae/ac

# Field Design Diagram

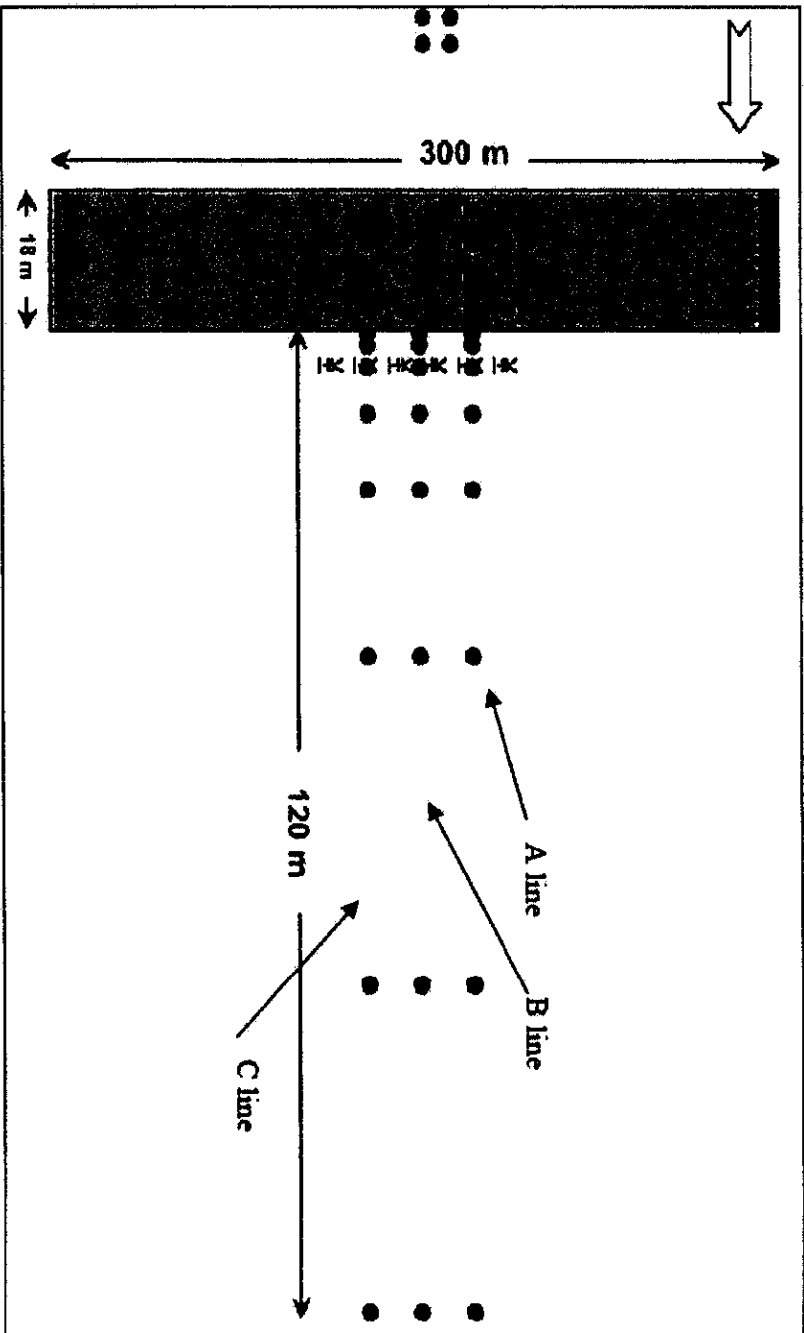


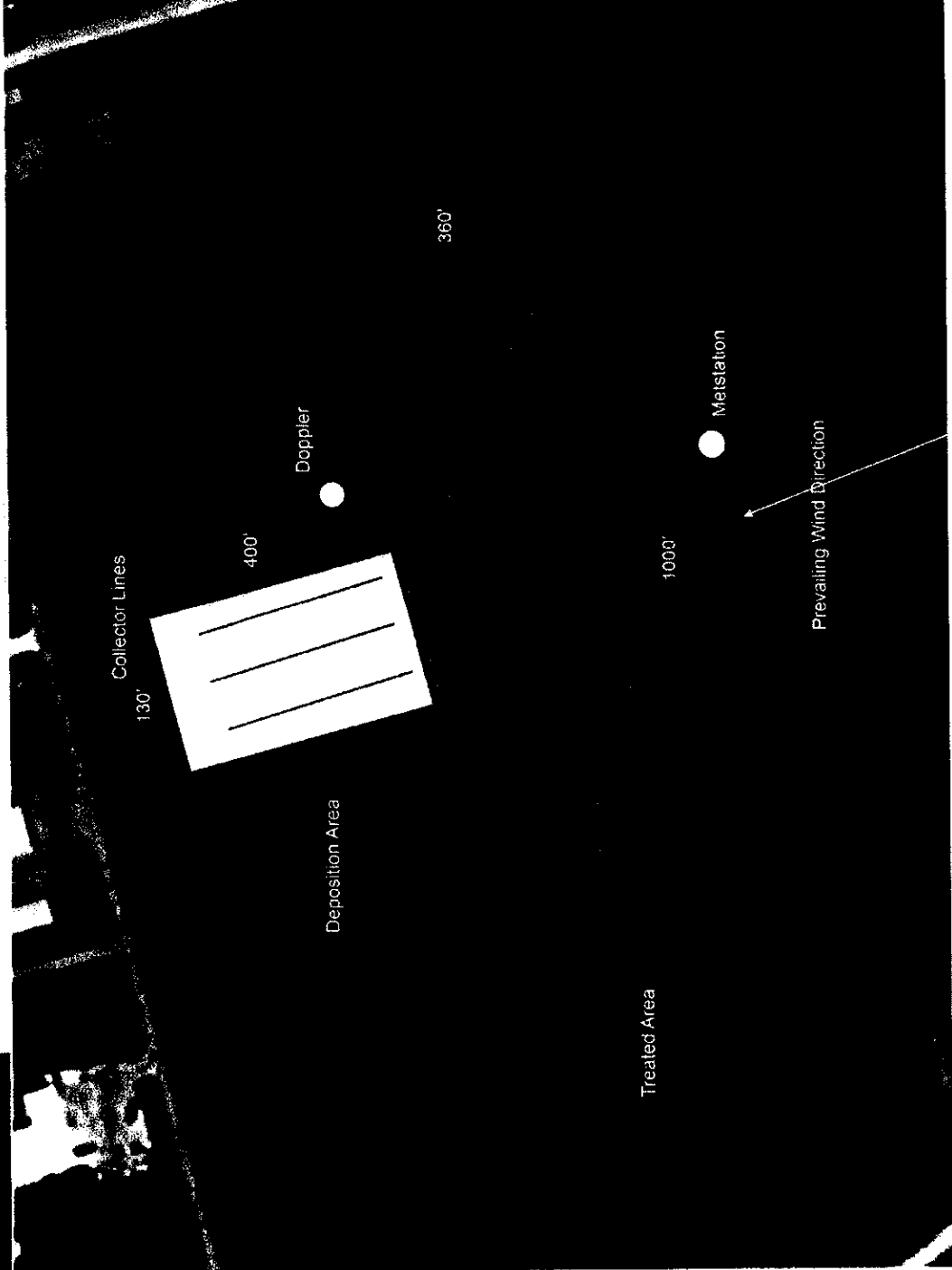
Figure 1. Field layout with sample collector placement.

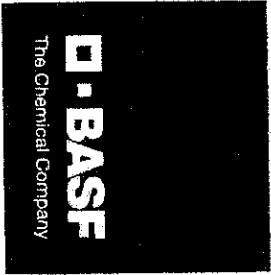
Sample collector placement intervals: 4, 8, 16, 32, 45, 60, 75, 90, 105, 120 m

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# In Field Plot Layout

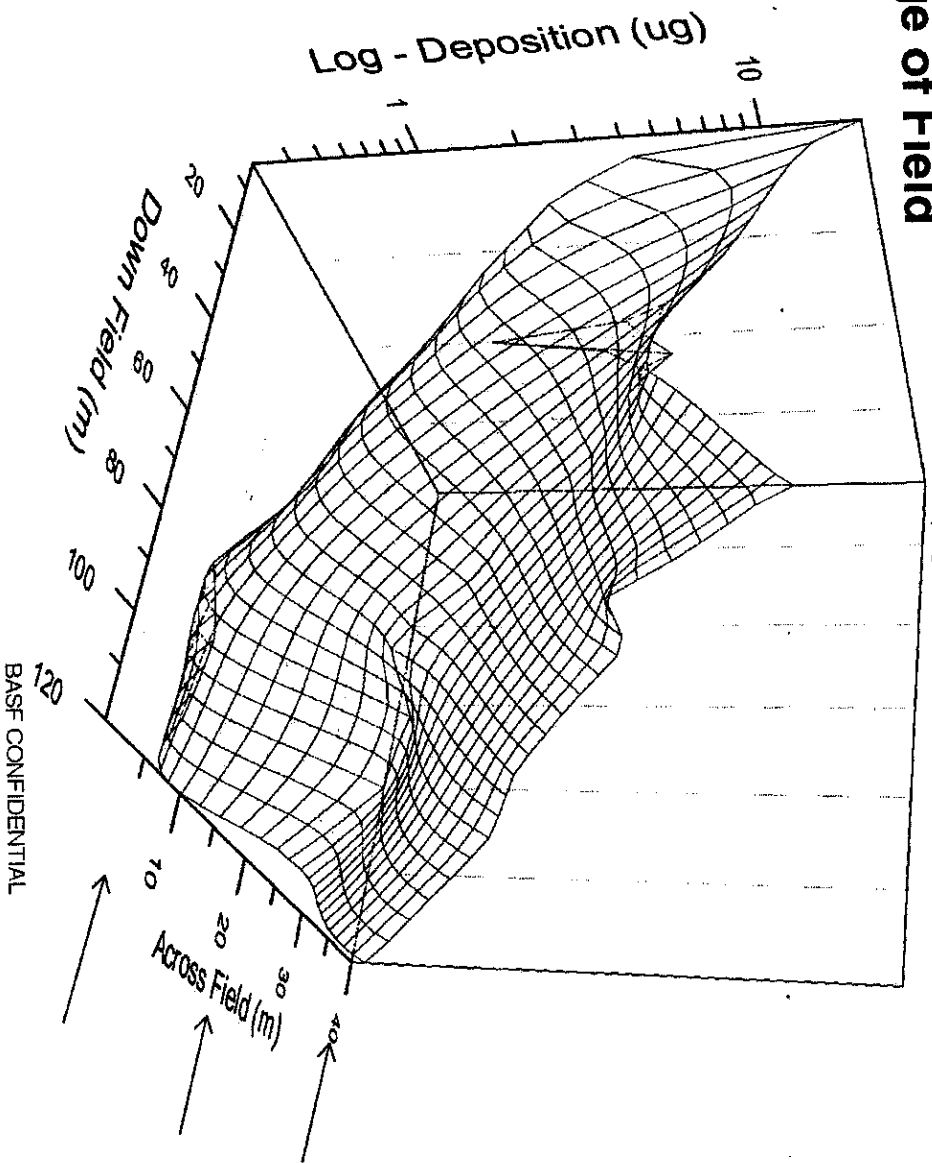




# Deposition Variability Across the Field

Edge of Field

09H AIXR11004  
(High Wind)



3 sampling Lines

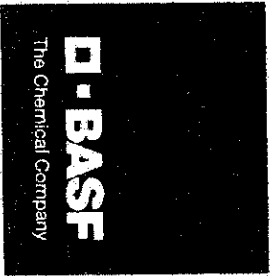
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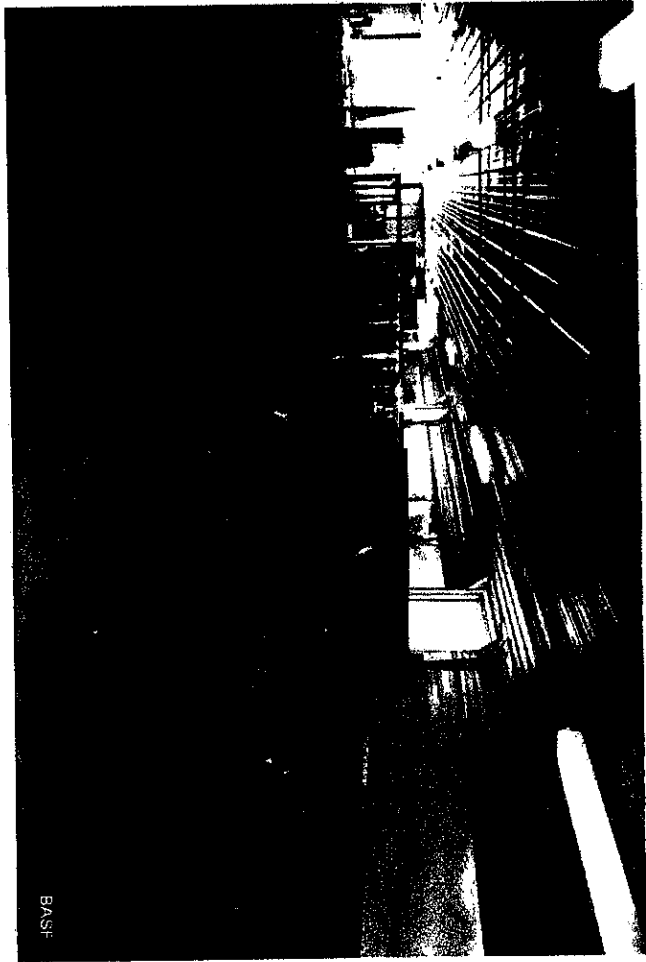
# Results

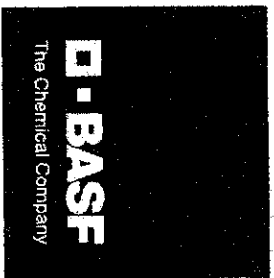
Treatment	Mix	Nozzle	VMD <sub>50</sub>	Wind	Mean Wind		Peak Wind		Resulting Buffer	
					(mph)	(mph)	1 lb/ac	0.5 lb/ac		
T1	Clarity	XR	236	L	4.85	6.28	293	147	Low speed Wind	
T2	Clarity	TTI	713	L	4.67	5.81	58	29		
T3	Clarity	AI XR	432	L	4.07	5.13	53	27		
T4	22H	XR	256	L	4.86	5.96	>380	250		
T5	22H	TTI	590	L	7.05	8.79	60	30		
T6	22H	AI XR	419	L	5.36	6.88	240	120		
T7	22H+rpm	XR	202	L	8.15	10.08	268	134		
T8	22H+rpm	TTI	673	L	7.24	8.67	13	7		
T9	22H+rpm	AI XR	360	L	4.29	5.30	527	264		
T10	clarity	XR	236	H	8.57	10.85	264	132		
T11	clarity	TTI	713	H	8.47	10.13	123	62		
T12	clarity	AI XR	432	H	9.71	11.79	347	174		
T13	22H	XR	256	H	4.34	5.85	>380	250	High speed Wind	
T14	22H	TTI	590	H	7.35	9.59	212	106		
T15	22H	AI XR	419	H	8.03	9.82	367	184		
T16	22H+rpm	XR	202	H	9.01	11.30	>380	>380		
T17	22H+rpm	TTI	673	H	10.25	12.87	266	133		
T18	22H+rpm	AI XR	360	H	10.44	12.94	>380	>380		

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# Particle Size Analysis – Wind Tunnel



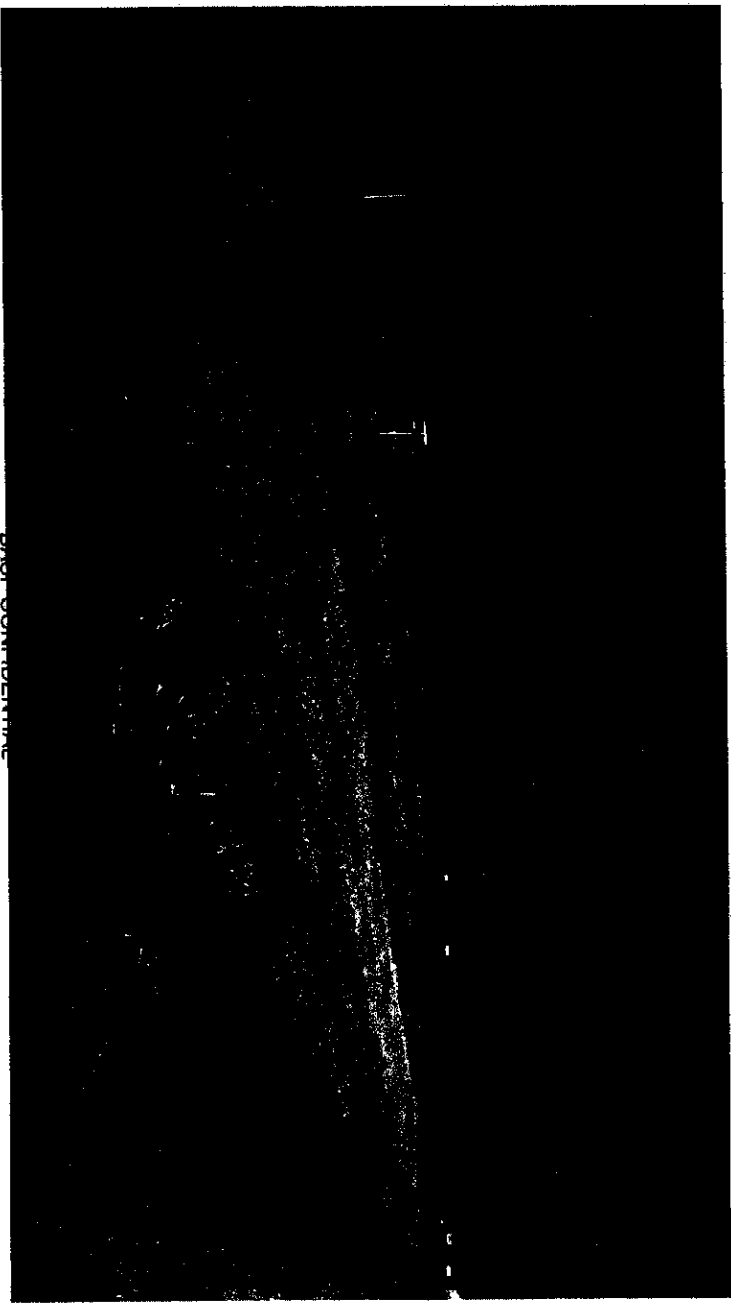


## **Concluding Our Work**

- Final Report Has Been Submitted to EPA
- Meeting to be scheduled to present data to EPA

# **Comparison of multiple sampling methods for evaluation of off field air born chemical movement – ‘2013**

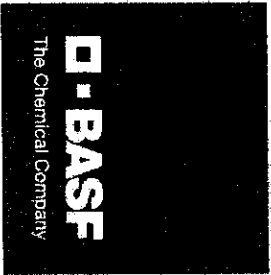
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## Introduction

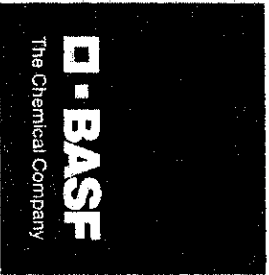
- This study is intended to document oversampling and poor correlation of 3D active air sampling when compared to mainstream techniques such as rotorod samplers and deposition collectors.
- Infield doppler instruments will be used in tandem with air samplers in an attempt to quantify the unnatural movement of particles to the samplers.
- This work is viewed as proactive work to counter claims by activists and errant researchers.
- Additionally it was deemed important that BASF generate data on our own product to put into perspective data generated by others on our product.



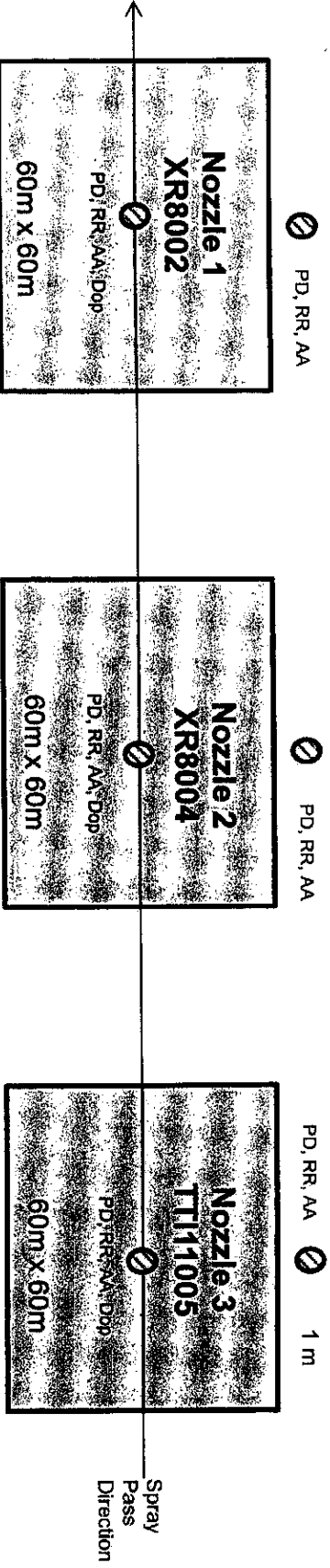
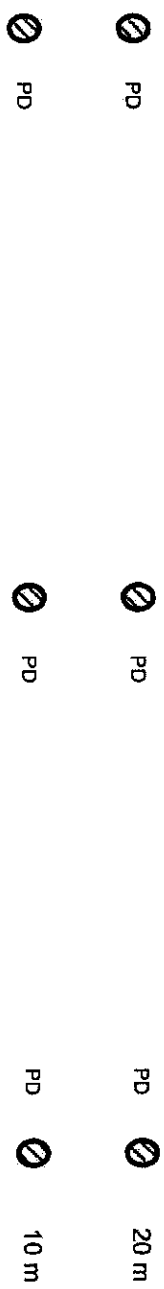
# Treatments (4 actives, 3 nozzles)

Treatment	Product	Rate	Target Volume GPA	Nozzle
1	Weedar	4 pt/ac	30	
2	Pursuit	6 fl oz/ac	30	XR8002, XR8004, TTI11005
3	Clarity	16 fl oz/ac	30	
4	Roundup Powermax	44 fl oz/ac	30	

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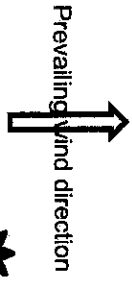


# Field Design



☉ Sampling Station

PD, RR, AA    ☉    UTC



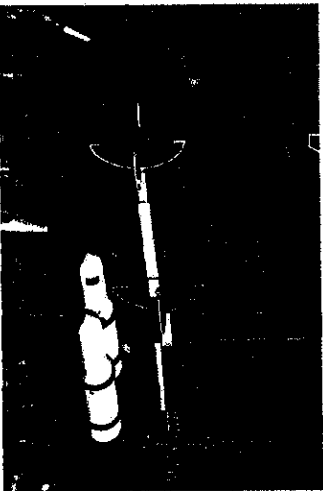
PD – Petri Dish      RR – Rotorod  
AA – Active Air      Dop. = Doppler

052108

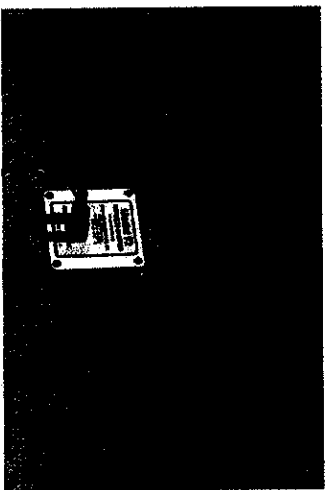
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# Sampling Methods Used in this Study

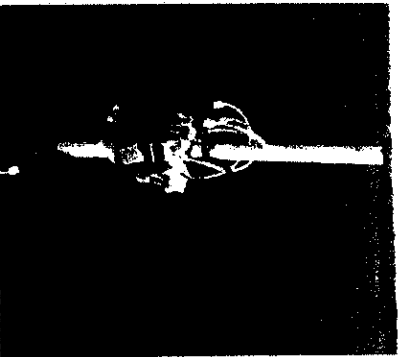
Doppler



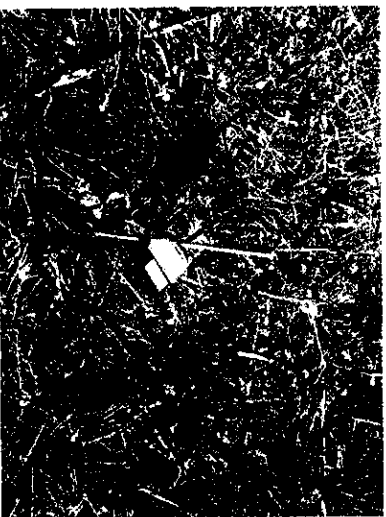
RotoRod



Active Air Sampling



Petri Dish

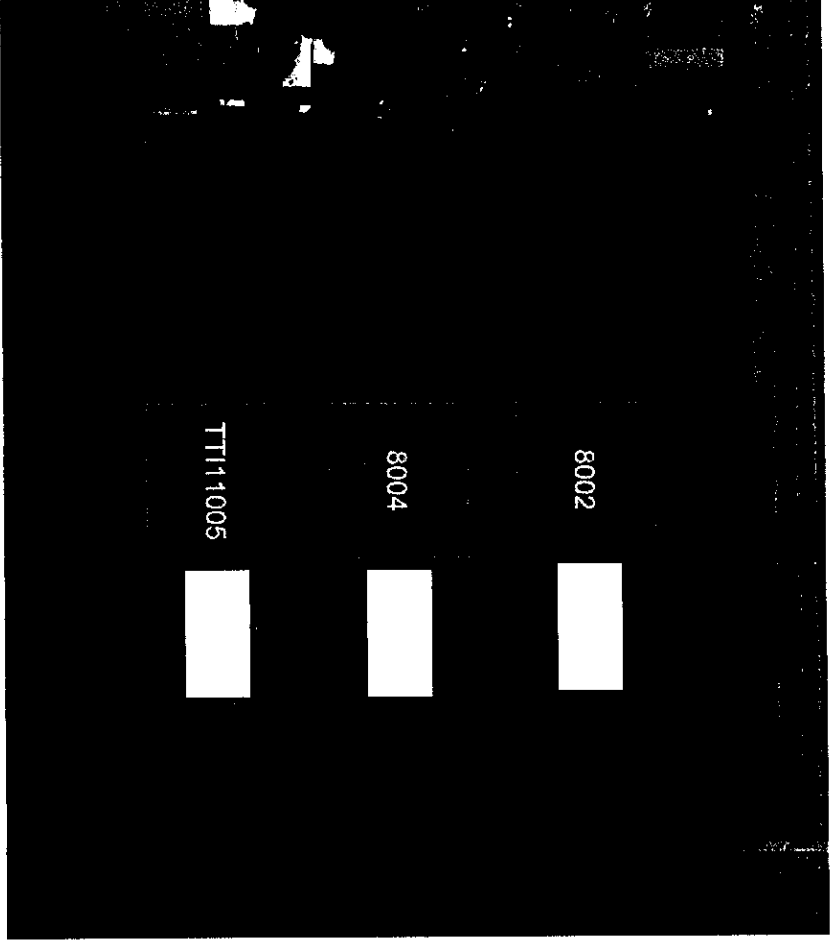


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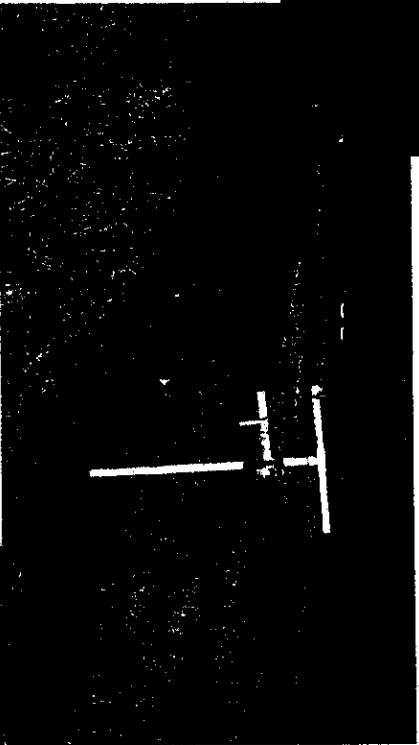
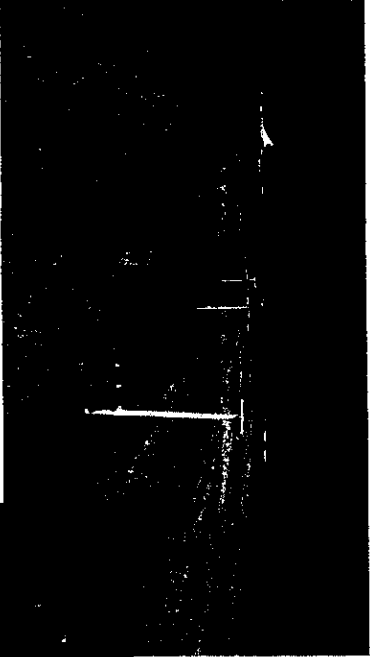
# In Field Plot Layout



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# Field Site Setup



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## Study Status

- All samples are at the lab
- Analytical Methods are operational
- Analysis is expected to begin soon

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