Office of Indiana State Chemist

Dicamba Discussion

Developing a Measurement of Success for Dicamba Application

Indiana Pesticide Review Board Meeting
January 22, 2018

What are the Objectives of this Process?

- Develop a measure(s) of success for the safe and effective use of agricultural dicamba herbicides in Indiana in 2019 and beyond.
- Identify the data set(s) that may be used in the evaluation & measurement process.
- Others?

Federal Product Registration & Distribution Standards

- U.S. EPA risk vs. benefit product registration decision.
- Decision based on assumption of 100% use according to label.
- Use according to label should result in no unreasonable adverse effects.
- Distribution of misbranded products is illegal.
- Misbranded means inadequate label directions to prevent adverse effects from legal use.

State Product Registration & Distribution Standards

- The board may collect, analyze, and interpret information on matters relating to the registration and use of pesticides.

- Distribution of misbranded products is illegal.

- Misbranded means product labeling does not contain instructions for use that, if complied with, are adequate for protection of the public.

Federal & State Use & Application Regulation

Misuse = use in a manner inconsistent with labeling.

- "The label is the law."
- Assuming users & regulators can determine:
  - which label statements are enforceable &
  - how to prove/document/enforce those statements

State Use & Application Regulation

- May not allow drift from target site in sufficient quantities to cause harm to non-target site.
- Drift does not include volatility after application.
- Harm includes documented death, illness, stunting, deformation, discoloration & other detrimental effects.

Label Misuse Violations Can Be Either:

- Violations of label performance standards:
  - It either happened or it didn't.
  - Usually requires physical evidence or adverse effect to confirm.
  - No harm, no foul.
- Violations of label design standards:
  - Proof of violation does not require an adverse effect.
  - Compliance can't guarantee no adverse effect, but it may suggest that.
  - Usually requires applicator coop., honesty, & reporting accuracy to confirm.

- **OISC has historically relied on performance standard violations for drift.**

Dicamba Label Performance Standard

DO NOT allow herbicide solution to drip, physically drift or splash onto desirable vegetation because severe injury or destruction to desirable broadleaf plants could result.

Dicamba Label Design Standards

- No wind blowing toward sensitive crops/plants
- Wind limits 3-10 mph only
- No buffer observed
- No site survey performed
- No website visited
- Wrong nozzles used
- Wrong boom height used
- No application during inversion
- No annual training
- No applicator certification
- No application records kept
- Wrong spray ground speed
- Wrong tank mix partner(s)

So, with the regulatory framework established, what happened starting in 2017?

- EPA registered new dicamba formulations for use on DT soybeans.
- Promise of less driftable & volatilite than older dicamba formulations.
- Very active in non-target plants at very low exposure rates.
- New use pattern expanded the historic seasonal application timing.
- Adequate large scale field trials may not have been conducted prior.
- Labels were developed that were overly prescriptive & detailed.
- Labels were not evaluated for user comprehension or practicality.
- Labels were not evaluated for enforceability by the state regulator.

2018 Labels Became Even More Complex

- As the result of record 2017 off-target incidents & complaints
- RUP classification
- Mandatory dicamba-specific training for all users *(state training)*
- Mandatory detailed recordkeeping requirements, including weather
- Prohibit application near downwind sensitive crops
- Tried to clarify mandatory buffer requirements
- Reduced max. wind speed from 15 to 10 mph
- Beefed up tank cleaning requirements

2019 Labels Changed 3rd Time in Three Years

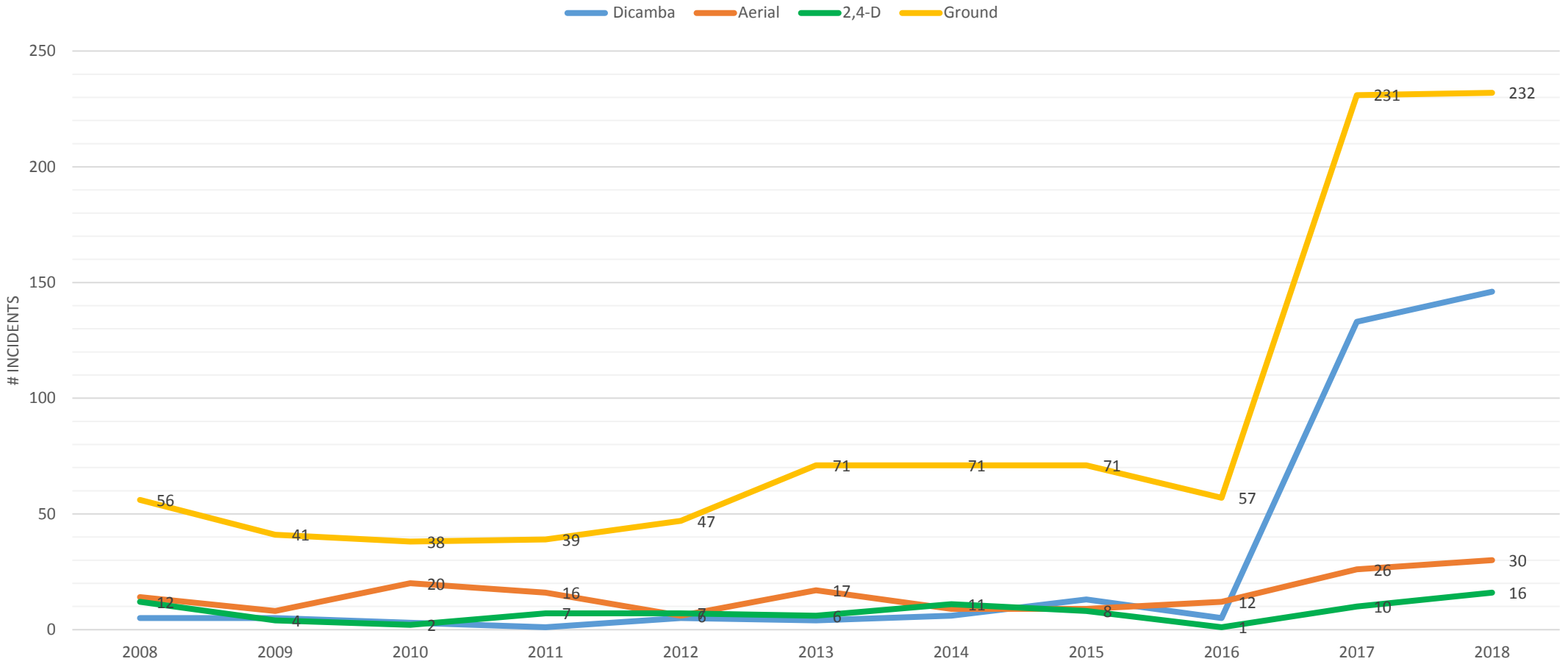
- As the result of another record complaint season in 2018
- Purchase & use only by certified applicators *(no supervision)*
- STOP application if wind shifts toward sensitive crops/plants
- No application 2 hours before sunset though 1 hour after sunrise
- No application after R1 growth stage OR 45 days after planting date
- Do not add adjuvants that lower the pH of spray mixture (below pH 5)
- Omni-directional 57’ buffers for endangered species protection
  - Posey & Harrison Counties only

What happened in Indiana in 2017 & 2018 ?

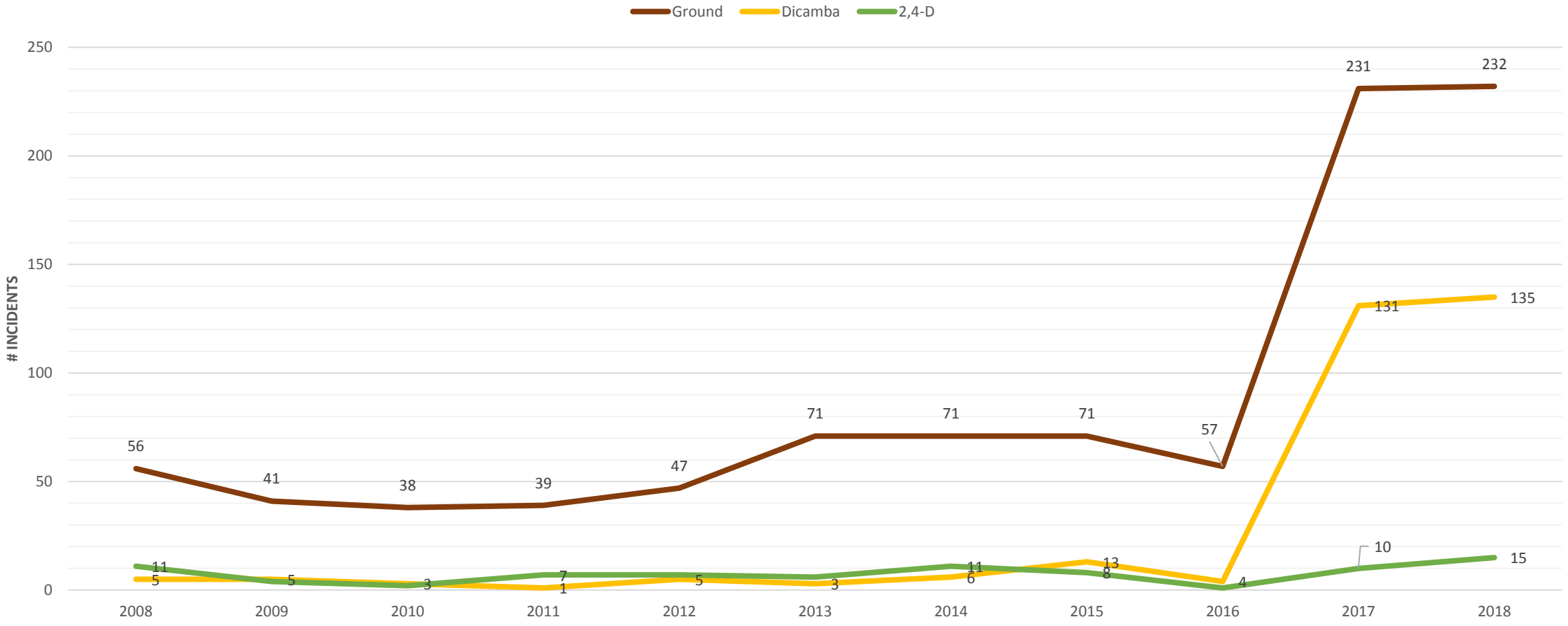
- 2017 ag ground application off-target (drift) complaints… 231
- 2017 dicamba drift complaints… 133
- 2017 percentage dicamba of total ag ground drift… 58%

- 2018 ag ground application off-target (drift) complaints… 232
- 2018 dicamba drift complaints… 146
- 2018 percentage dicamba of total drift… 62%

All Agricultural Drift Complaint Investigations



Ground Ag Drift Complaints *(measure?)*



2017 & 2018 OISC Dicamba Investigations

Who were the Applicators?

- Licensed private applicator… 62%...62%
- Licensed commercial applicator… 23%...36%
- No license… 15%...2%

2017 & 2018 OISC Dicamba Investigations

What were the Target Crops or Sites?

- Soybeans… 92%...93%
- Corn… 6%...6%
- Other… 2%...1%

2017 & 2018 OISC Dicamba Investigations

What is the Site of Off-target Exposure

- Soybeans… 92%...94%
- Melons… 1%...2%
- Tomatoes… 1%...0%
- Grapes… 0%...0%
- Garden… 2%...1%
- Ornamentals or trees… 3%...2%
- Other… 2%...1%

2017 & 2018 OISC Dicamba Investigations

Which Dicamba Products Were Applied?

- Engenia… 45%...56%
- FeXapan… 7%...5%
- Xtendimax…. 40%...32%
- Other dicamba… 8%...6%

2017 & 2018 OISC Dicamba Investigations

What was the Documented Route of Off-Target Exposure?

- Evidence of off-target exposure… 100%
- Particle drift… 23%...16%
- Application during an inversion… ?
- Volatilization… ?
- Undeterminable…77%...84%
  - *Insufficient evidence to document particle drift*

Evidence of Particle Drift Violations Include:

- Visual gradient drift pattern
- Chemical gradient drift pattern
- Residues of dicamba tank mix partner in visually impacted non-target field or site

2017 & 2018 Dicamba Complaint Violations

- Evidence of off-target symptomology… **100%...100%**
- Total dicamba complaints… **133…141** *(85% of 2018 finalized)*
- Documented drift *(performance std.)*… **23%...16%**
- Documented drift mgmt. violations *(design std.)* … **93%...87%**
- Total documented violations… **93%...87%**

- **Drift mgmt. violation ≠ cause of off-target movement**

Conclusions from 2017 & 2018 violation data

- OISC has been successful (so far) at:
  - documenting extremely high rates of violation of drift design standards
  - levying numerous civil penalties
  - revoking some applicator certifications

- OISC has been unsuccessful at:
  - documenting large numbers of drift performance standard violations
  - determining with forensic evidence the cause of off-target movement
  - significantly reducing # of incidents through training & enforcement

IPRB Dicamba Work Group Recommendations

- EPA didn't make federal registration decision until 10-31-18

- Work group recommended to OISC:
  - No application post-emergent to soybeans after **June 20, 2019**
    - based on 2017 & 2018 data could reduce off-target incidents by ~ 50%

  - The terms "neighboring" and "adjacent" used on the labels shall mean:
    - any non-dicamba tolerant soybeans within ¼ mile; and
    - any other sensitive crop or residential plant within ½ mile of the application site.

2017 & 2018 Dicamba Investigation Spray Dates

Application Date

- Before May 1… 2%
- May 1-7… 2%
- May 8-14… 1%
- May 15-21… 2%
- May 22-28… 6%
- May 29-June 4… 10%
- June 5-11… 12%

Application Date

- June 12-18… 13%
- June 19-25… 9%
- June 26-July 2… 11%
- July 3-9… 10%
- July 10-16… 7%
- July 17-23… 3%
- July 24-30… 1%

Industry Comments on IPRB Work Group Recommendations

- Indiana Farm Bureau
- Agribusiness Council of Indiana
- Indiana Soybean Alliance
- Individual growers, custom applicators & seed dealers
  - Letter writing & phone call campaign

Industry Comments Include:

- 2019 label changes should be given a chance to work first before taking state action.
- If there are no similar restrictions in other states, this will be a competitive disadvantage to IN growers.
- There are no other economically viable resistant weed control options.
- Double crop soybeans require later weed control applications.

Industry Comments Include:

- I prefer Xtend soybean yield genetics, why penalize me?
- More annual training of applicators is answer to reducing complaints.
- Products can be used without incident, if labels are strictly followed.
- Most 2017 & 2018 incidents involved non-DT beans with no yield impacts.

2019 OISC Compliance Strategy

- Increase monitoring & investigation intensity of incidents involving tomatoes, vegetables, grapes, melons, gardens, ornamentals, flowers, trees, & organic crops.

- Seek off-target monitoring & reporting assistance from outside sources (IDNR, PPPDL, CES, IDEM, Commodity Groups…)

- For complaints of exposure to soybeans, on-site confirmation of dicamba exposure symptomology, but no forensic attempt to document cause or misuse.

2019 OISC Compliance Strategy

- For insistent soybean exposure complainants, request a significant amount of upfront information & detail before initiating a misuse investigation.

- Utilize certification revocation for egregious & repeat label violators.

- Work with stakeholders to identify measurement(s) of success for safe & effective application in 2019 & beyond.

Issues to Consider Before 2019 Use Season

1. Do off-target exposure symptoms to non-DT soybeans without documentation of negative yield impacts qualify as “adverse effects” under federal misbranding standards?

2. Do exposure symptoms without yield impact qualify as “harm” under state drift rule or state misbranding standards?

3. Does drift include off-target movement from application during an inversion?

Issues to Consider Before 2019 Use Season

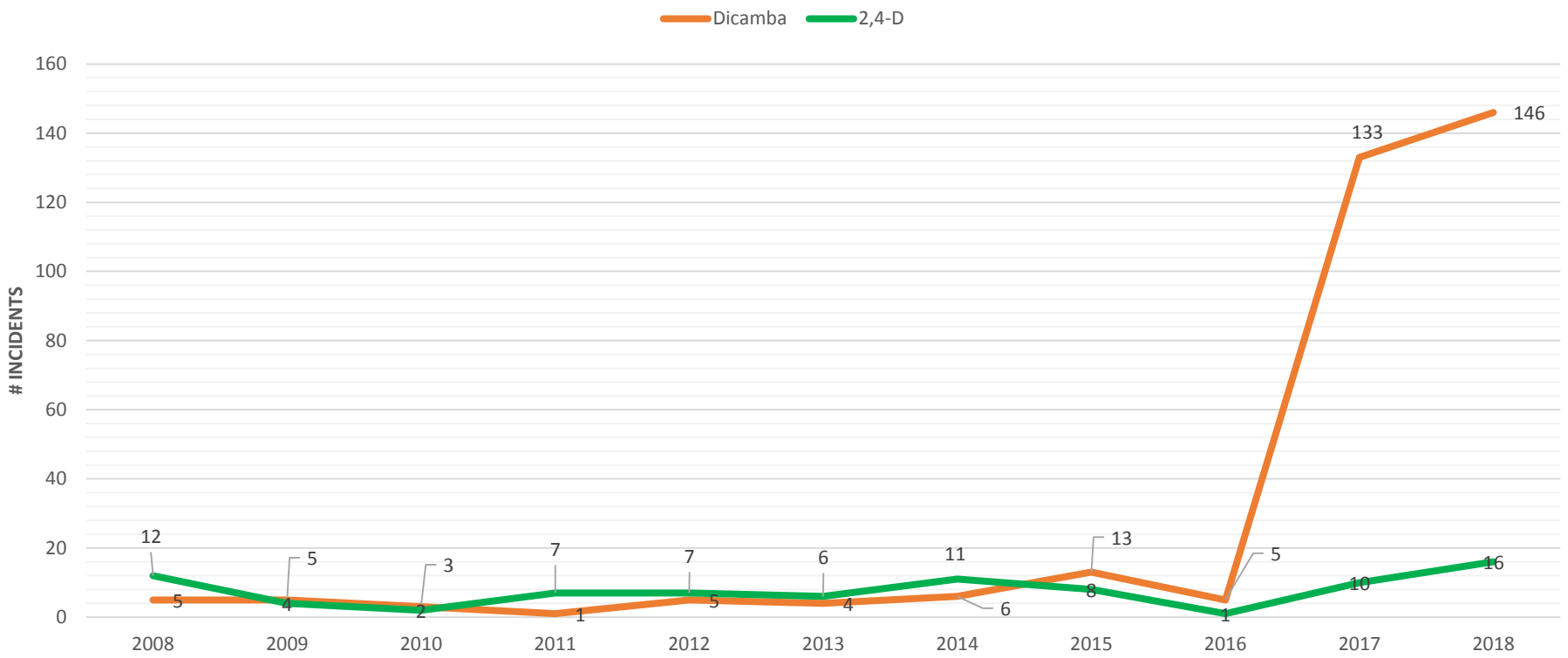
4. Should data other than off-target incident data be considered?

5. Should incident data for exposure to non-DT soybeans be considered independently from exposure data to others crops or plants?

6. Should violation rate be considered?

7. Is there a number or percentage of incidents that should define success?

2019 Measure of Success



Comments or Questions ?

Thank you !

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