

SharpShooter Sprayer Technology



Sprayer Technology Sales Training





Blended Pulse Systems and VariTarget Nozzles

“Theory of Operation Comparison”

Blended Pulse products by Capstan Ag Systems are

- **AIM Command** (factory option)
 - **SharpShooter** (retrofit version)
- Both Blended Pulse and VariTarget Nozzle systems are versions of a ***pre-orifice tip design***.
 - The pre-orifice changes to control flow
 - A singular exit orifice defines the droplet spectrum.

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Blended Pulse Systems and VariTarget Nozzles

“Theory of Operation Comparison”

VariTarget nozzles use a mechanical plunger to change the pre-orifice size in order to vary the flow.



- A larger speed range (2 to 20 mph) is possible with less of a pressure and droplet size change compared to a standard tip.
- One tip can address a larger rate range (5 to 40 GPA).
- ***However the complete speed range and rate range cannot happen concurrently.*** The speed and pressure range depends on the precise rate.
- VariTarget cannot “target” a precise VMD droplet size. It is still limited to a droplet size RANGE (Medium, Coarse, VC, etc)
- VariTarget requires different exit tips to change the droplet size range.
- Speed, rate, pressure and droplet size are still interdependent and cannot be controlled individually.

Blended Pulse Systems and VariTarget Nozzles

“Theory of Operation Comparison”

SharpShooter uses a *Blended Pulse Width Solenoid* to change the “effective orifice size” of the pre-orifice for flow control.

- The proper flow is managed at the pre-orifice so that rate and pressure set points are held constant in response to application challenges
- Speed, rate, pressure and droplet size can now be **individually** controlled independent of each other.
- A larger speed and rate ranges, at a constant pressure, are concurrently available compared to a standard tip and VariTarget
- A precise VMD droplet size can be targeted and maintained
- A standard tip is used as an exit orifice to control the droplet size and spectrum. The droplet size can be changed by “on-the-go” by the operator without changing the exit tip or changing speed.



Blended Pulse Systems and VariTarget Nozzles

“Practical Comparisons”

There are different modes of chemical action with the target pest.

- **Systemic** herbicides travels through the weed and kills the whole plant. (A few larger droplets will do)
- **Contact** herbicides attack only the surface of the pest, whether plant or insect. (More and smaller droplets to cover the surface are required)
- Thus each mode requires a different rate and different optimum VMD droplet size to provide the most effective coverage.
 - Systemic: Fewer, larger droplets
 - Contact: More smaller droplets

For a given GPA rate:

- VariTarget functions along a singular tip curve
- Blended Pulse Systems provides a family of tip curves; a tip curve envelope



Blended Pulse Systems and VariTarget Nozzles

“Practical Comparisons”

Example: RoundUp is a systemic mode of action

- The optimum droplet size may vary from a 300 VMD to a 450 VMD depending on the area of the country.
- Rates typical vary within a limited range precise to a geographic location.
 - Western Canada 3 to 5 GPA with 330 to 350 VMD droplets
 - US Plains 5 to 7 GPA is typical with 400 VMD droplets
 - MidWest and South 10 to 12 GPA with 400 VMD droplets
 - East 12 to 15 GPA with 400 VMD droplets

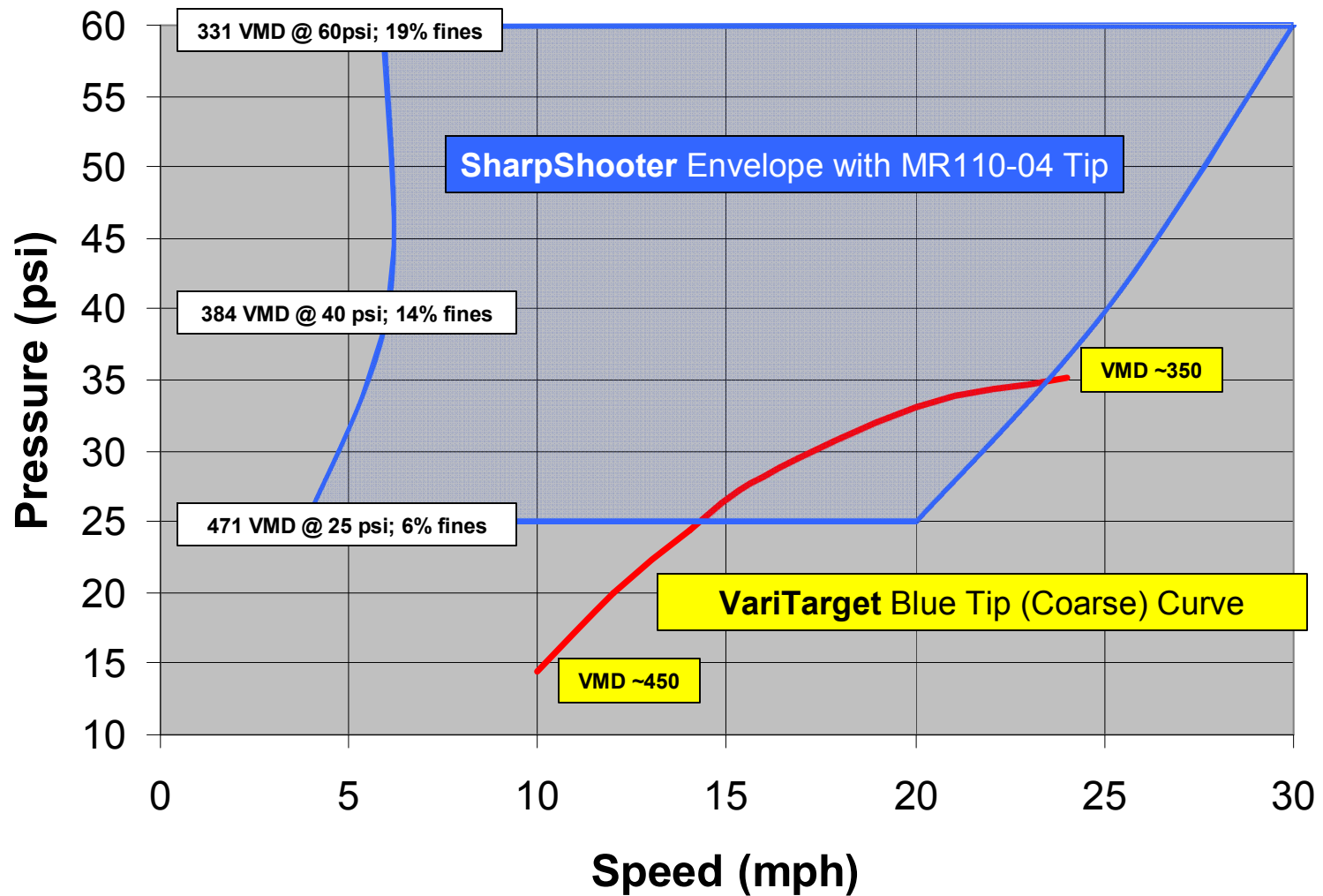
Compare Blended Pulse with the VariTarget
for a 5 to 7 GPA RoundUp Application in the US Plains

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SharpShooter vs VariTarget

RoundUp @ 5 GPA

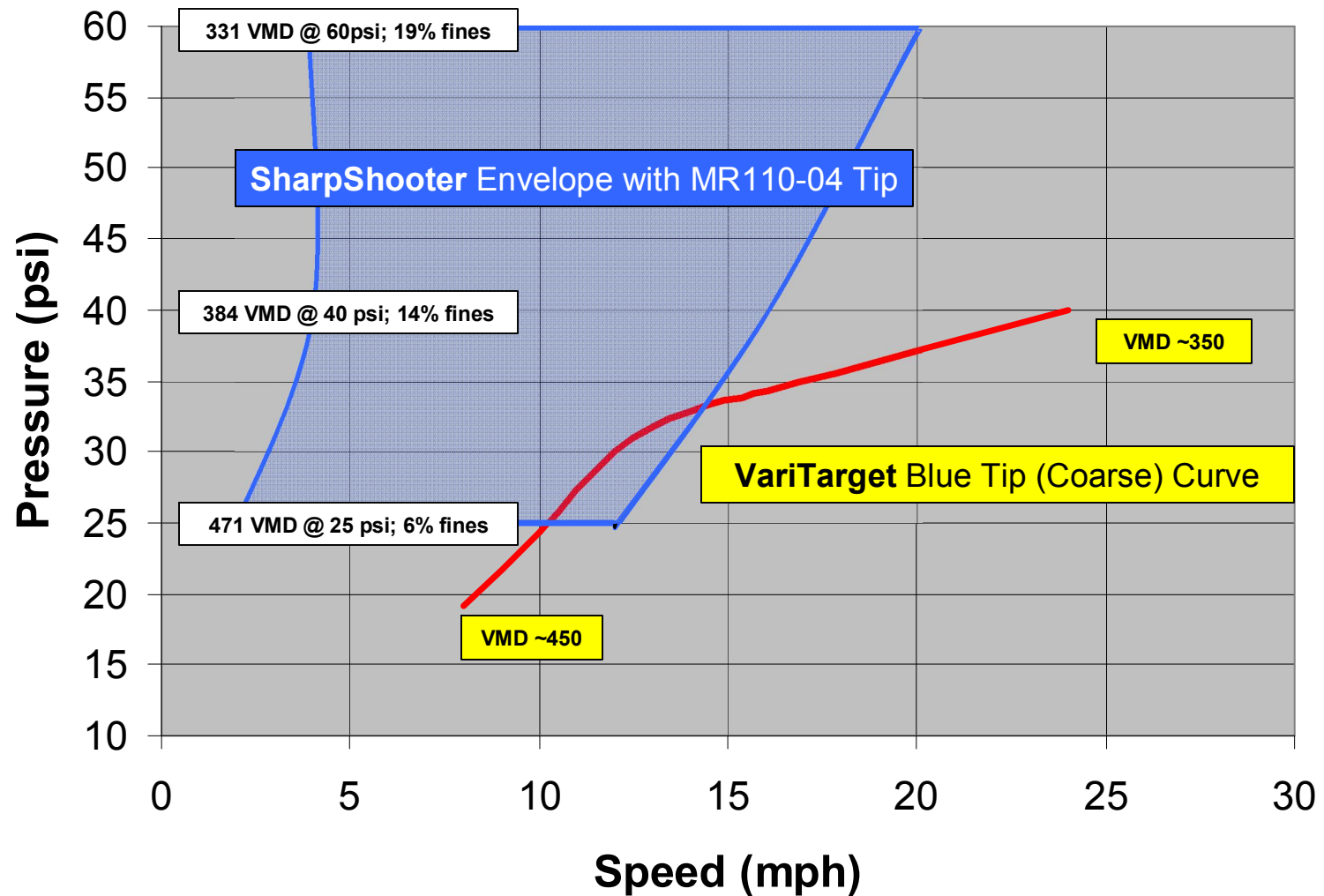


Comparison of 5 GPA RoundUp Application

Performance Item	SharpShooter	VariTarget
• Tip	MR110-04	Blue Tip (Coarse)
• Constant Pressure Control	Yes	No
• Operator Controlled Pressure	Yes	No
• Optimum Droplet Control	331 @ 60 psi from 7.0 to 28.1 mph	350 @ 35 psi at 24 mph only
• Consistent Coverage	Yes	No
• Speed Range Total	4.5 to 28.1 mph	10 to 24 mph
– @ 60 psi	7.0 to 28.1	Not possible
– @ 35 psi	5.4 to 26.6 mph	24 mph only
– @ 25 psi	4.5 to 18.0 mph	14 mph only
– @ 15 psi	Not Applicable	10 mph only
• Loss of Pattern Pressure	< 4.5 mph	< 10 mph
• Low speed Over-application	< 4.5 mph	< 10 mph
• Maximum Penetration Pressure	60 psi thru speed range	35 psi at 24 mph
• On-the-Go Drift Control	Yes, Operator Selected	No, Slow Down
• Immediate Nozzle ON/OFF	Yes	No
• Section Overlap Optimization	Yes	No

SharpShooter vs VariTarget

RoundUp @ 7 GPA



Comparison of 7 GPA RoundUp Application

Performance Item

- Tip
- Constant Pressure Control
- Operator Controlled Pressure
- Optimum Droplet Control

- Consistent Coverage
- Speed Range Total
 - @ 60 psi
 - @ 40 psi
 - @ 25 psi
 - @ 15 psi
- Loss of Pattern Pressure
- Low speed Over-application
- Maximum Penetration Pressure
- On-the-Go Drift Control
- Immediate Nozzle ON/OFF
- Section Overlap Optimization

SharpShooter

MR110-04
Yes
Yes
331 @ 60 psi
from 5.0 to 20.1 mph
Yes
3.2 to 20.1 mph
5.0 to 20.1mph
4.1 to 16.5 mph
3.2 to 12.9 mph
Not Applicable
< 3.2 mph
< 3.2 mph
60 psi thru speed range
Yes, Operator Selected
Yes
Yes

VariTarget

Blue Tip (Coarse)
No
No
~350 @ 40 psi
at 24 mph only
No
10 to 24 mph
Not possible
24 mph only
10 mph only
7 mph only
< 7 mph
< 7 mph
40 psi at 24 mph
No, Slow Down
No
No



Blended Pulse Systems and VariTarget Nozzles

“Practical Comparisons”

Example: RoundUp is a systemic mode of action

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 - Western Canada 3 to 5 GPA with 330 to 350 VMD droplets
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 - MidWest and South 10 to 12 GPA with 400 VMD droplets
 - East 12 to 15 GPA with 400 VMD droplets

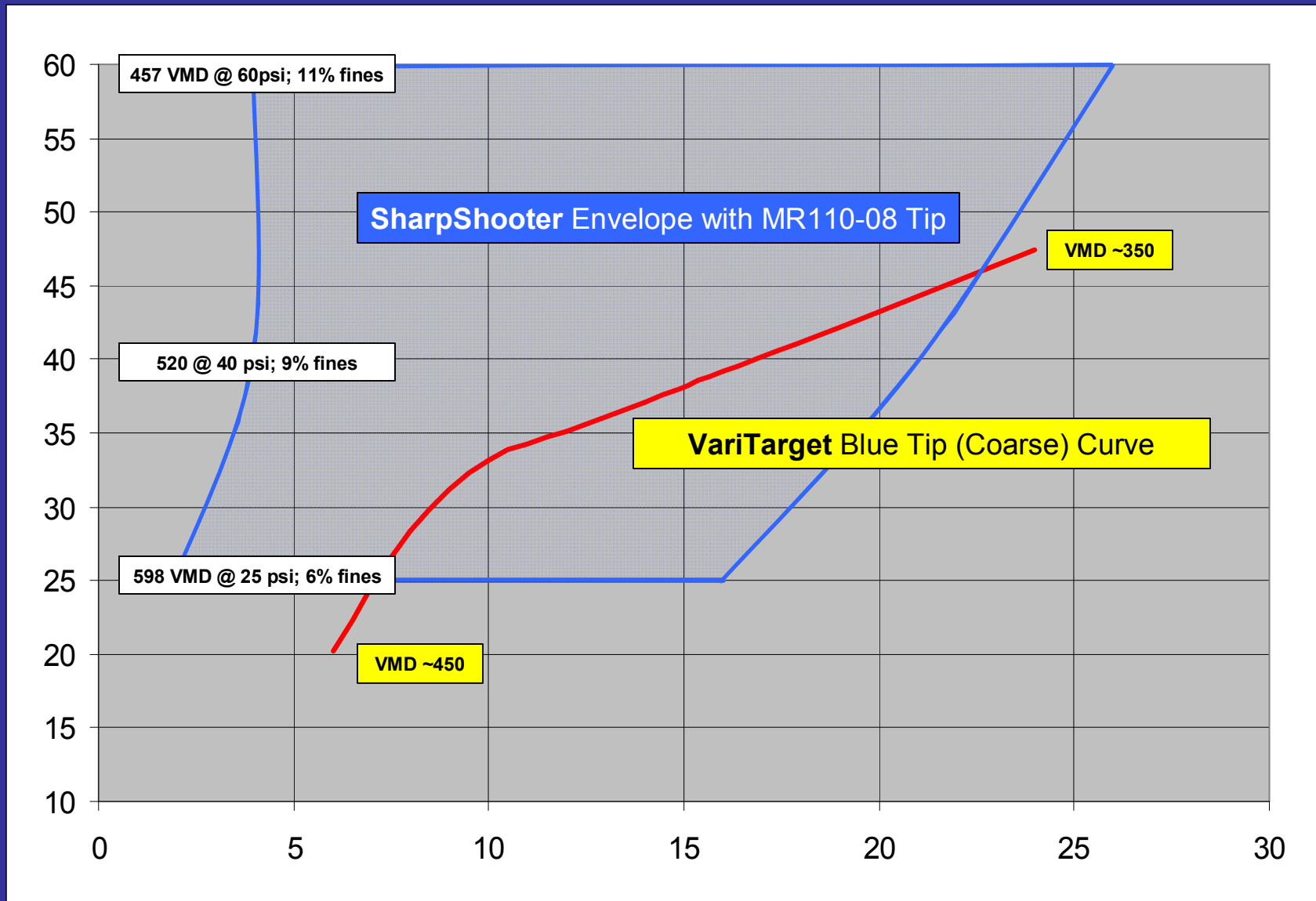
Compare Blended Pulse with the VariTarget
for a 10 to 12 GPA RoundUp Application in the US Plains

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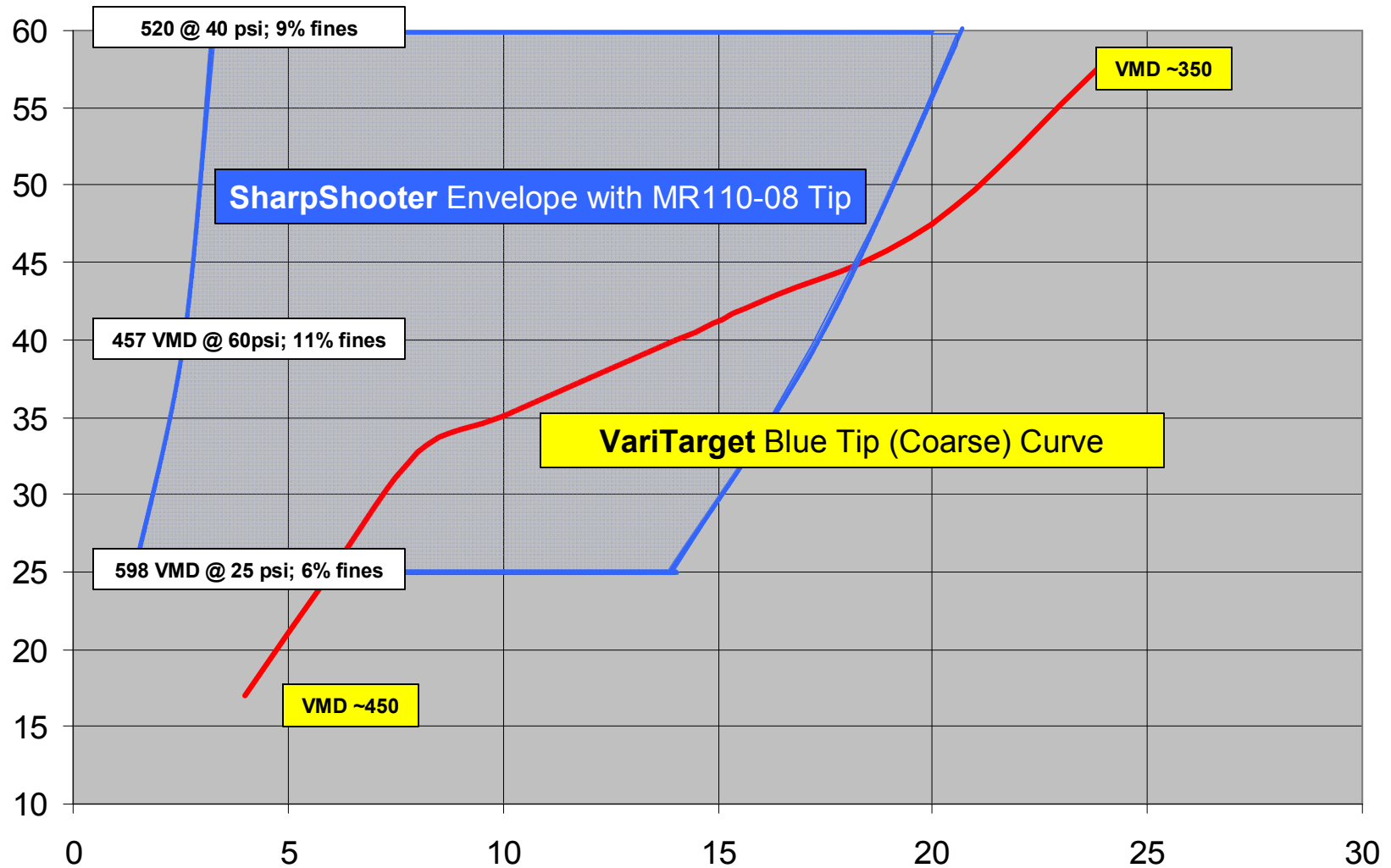
SharpShooter vs VariTarget

RoundUp @ 10 GPA



SharpShooter vs VariTarget

RoundUp @ 12 GPA





Blended Pulse Systems and VariTarget Nozzles

“Practical Comparisons”

Example: Fungicides, Insecticides and Contact Weed Herbicides represent a **contact mode** of action

- The optimum droplet size is typically around a VMD of 250 to 280 in most areas of the country.

(Note: Applications practices with smaller droplets are a limitation of the application technology and not from agronomic requirements)

- Rates typical vary within a limited range precise to a geographic location.

10 to 12 GPA with 250 VMD droplets

12 to 15 GPA with 280 VMD droplets

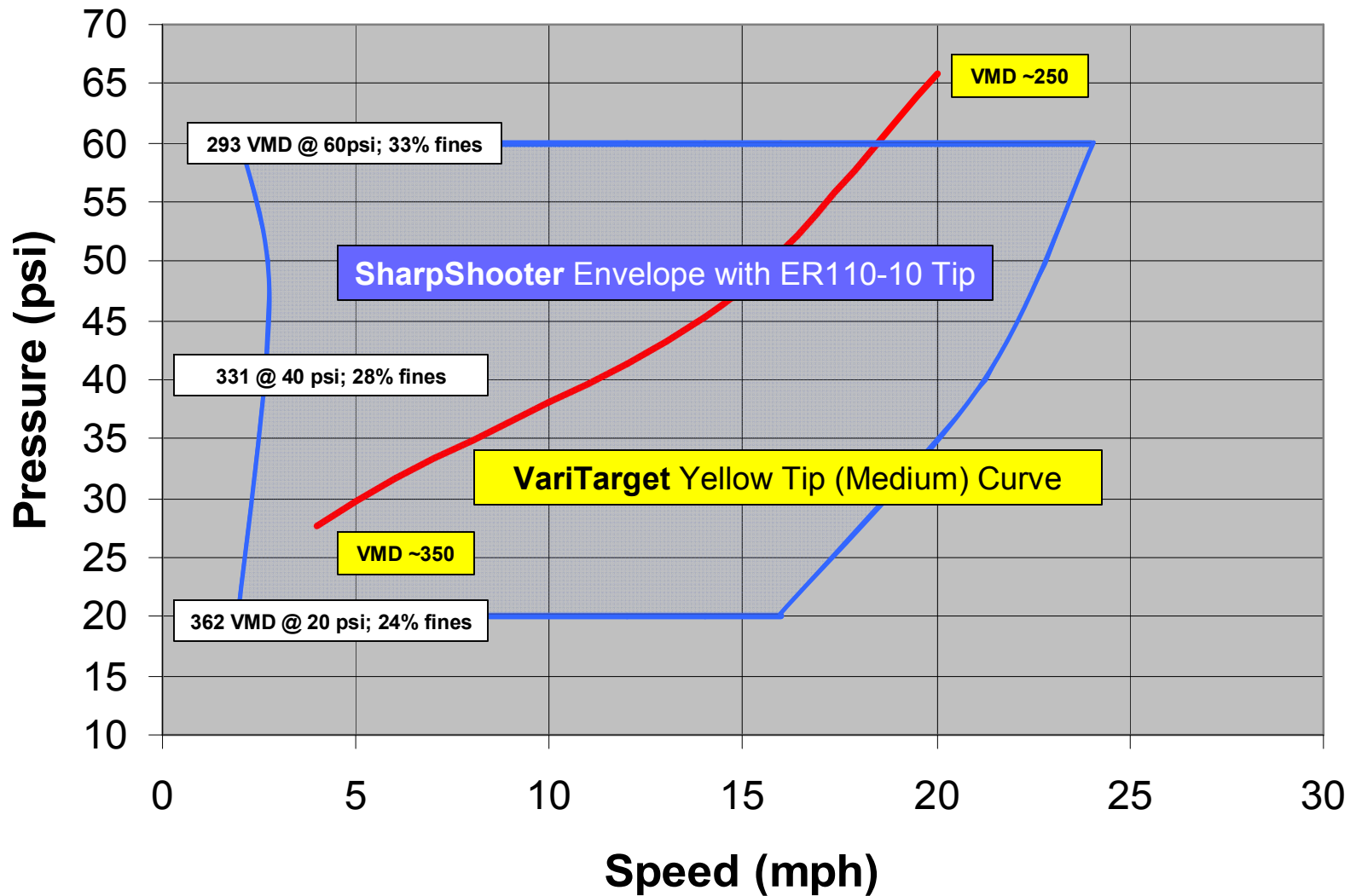
15 to 20 GPA with 280 VMD droplets

Compare Blended Pulse with the VariTarget
for a 12 to 15 GPA Fungicide Application in the US Plains

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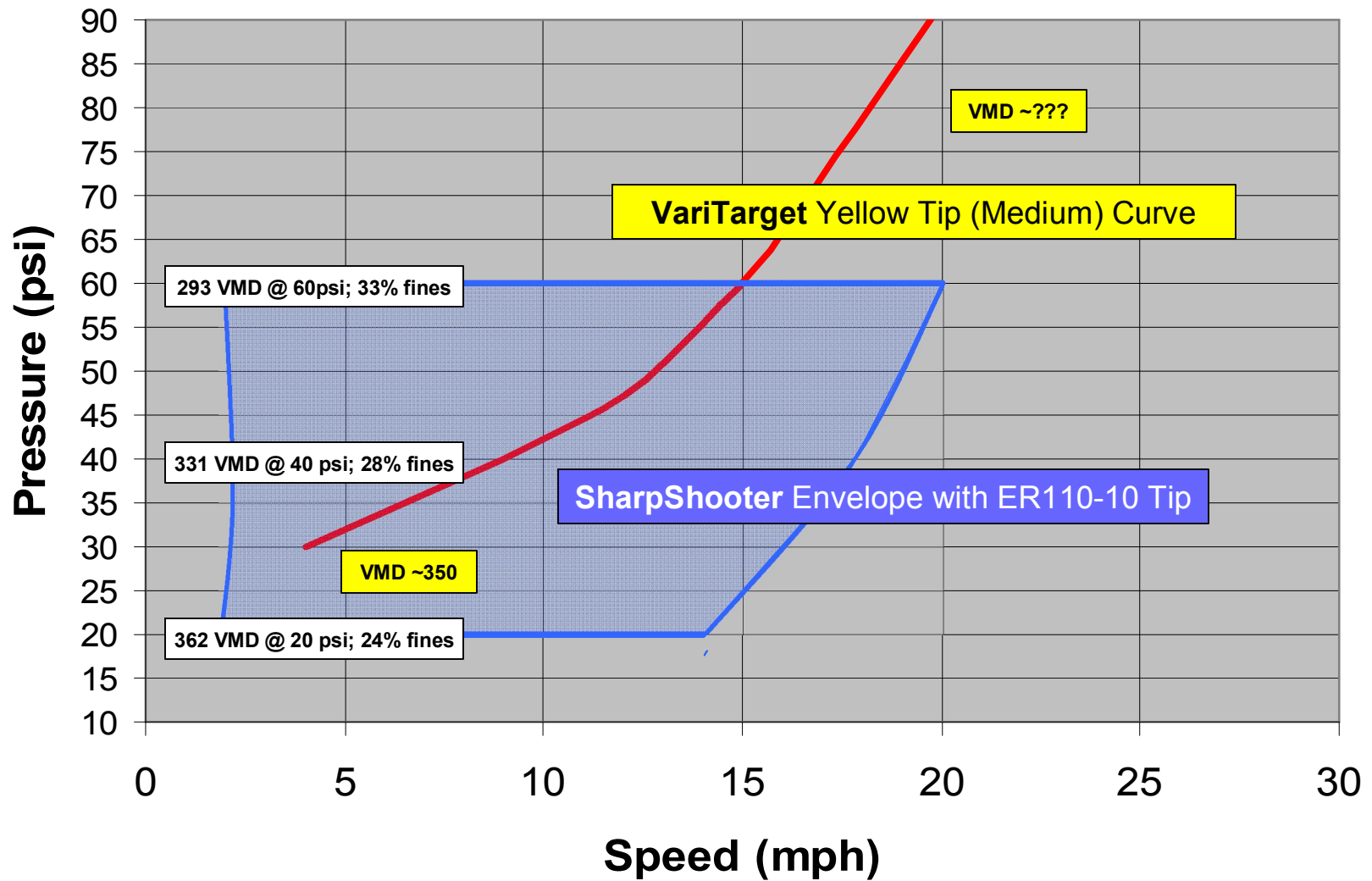


SharpShooter vs VariTarget Contacts @ 12 GPA



SharpShooter vs VariTarget

Contacts @ 15 GPA





Additional Considerations

SharpShooter

- Demonstrated 10 Year Life Cycle
- Reliable and Durable
(Proven since introduction in 1997)
- Over 95% repurchase history.
(Once customers have it they buy it again.)
- Performance unaffected by tip wear
- Instant ON/OFF
- Even and consistent coverage within a 6:1 speed range
 - Operates with a family of tips curves
 - Solves low-speed over-applications
- “On-Demand Drift” Control without reduction in speed
- 6:1 Speed range concurrent with rate range capability
- Rate range matches application practices
- Success is a result of credibility and customer satisfaction!

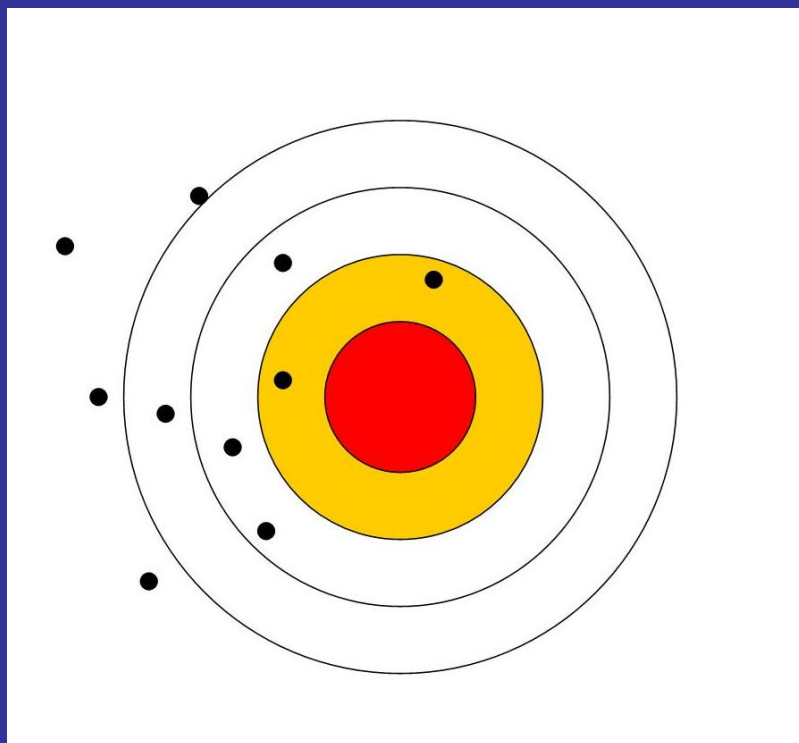
VariTarget

- More expensive over a 5 year period
(Wears like a tip and should be replaced as often as a tip...yearly.)
- Performance decreases with tip wear
- No Instant ON/OFF
- Even coverage only at optimum speeds
 - Still applies along a singular tip curve with droplets varying with speed
 - Still doesn't address low speed over-applications)
- Comparable drift control still requires reduction in speed
- 5:1 Speed range optimized with only specific rates
- 8:1 Rate range optimized with only specific speeds



Accuracy and Precision

“VariTarget with the Wrong Exit Tip”



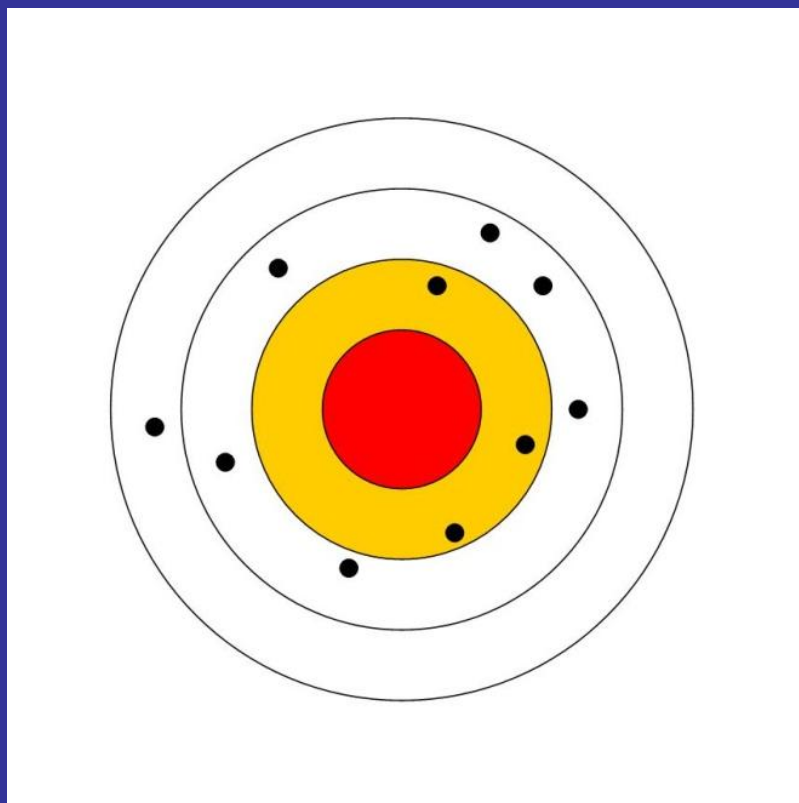
What we know.....

- Nothing in the red...not accurate
- Not a very tight group...not precise



Accuracy and Precision

“VariTarget with the Right Exit Tip”



What we know.....

- Still nothing in the red...average falls in the middle
- Still not tight group...not precise

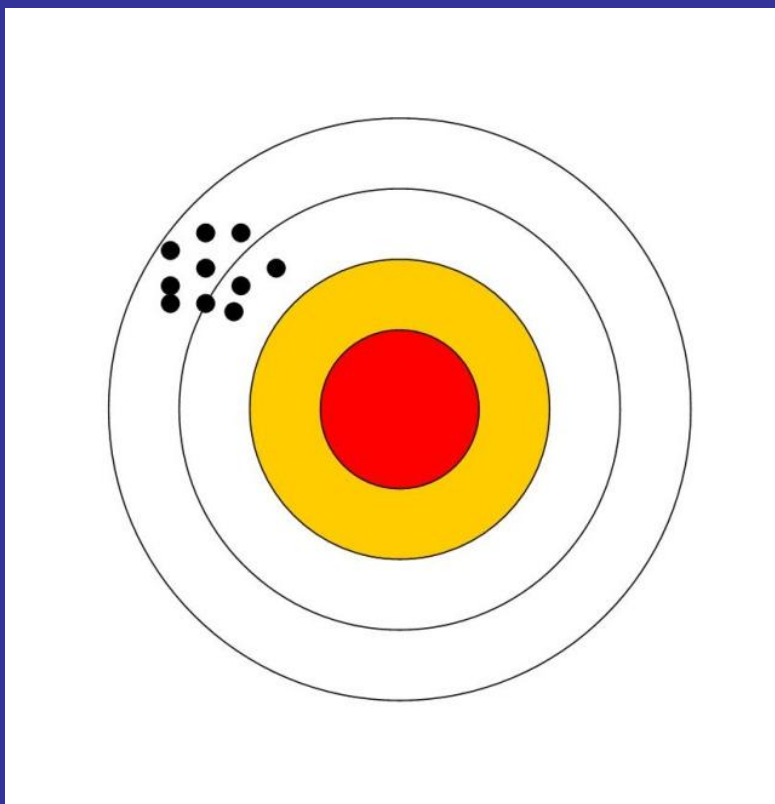
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Accuracy and Precision

“SharpShooter with the Wrong Tip”



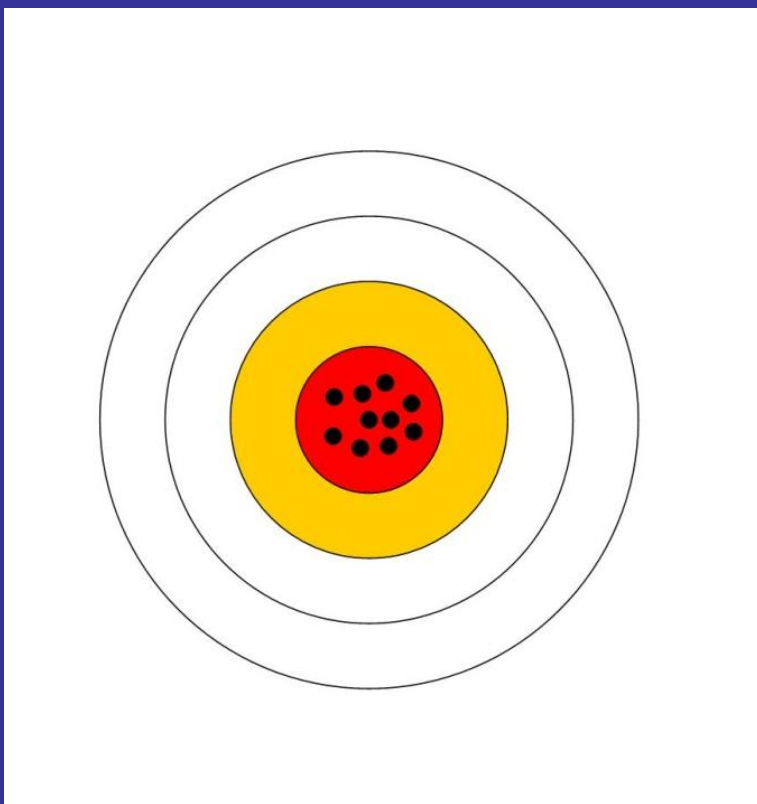
What we know.....

- Nothing in the red...not accurate
- Nice grouping!...precise



Accuracy and Precision

“SharpShooter with the Right Tip”



What we know.....

- Accurate...Everything is in the red
- Precise...Excellent grouping

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