Flow Rate Adjustment Worksheet

Customer Name:_____
Date:_____
Product:_____
Target Rate_____GPA
Planting Speed_____MPH
# of rows_____
Optimal Operating PSI_____PSI
Row Spacing_____Inches

1. Set up the Mobile Max to match the customer's planter setup with # of rows, row spacing, and vApply HD module and Flowsense locations.

2. From the Diagnose screen, enter a health check for a liquid product and enter the desired GPA and MPH
3. Once the pump is running, make sure Actual GPM and Commanded GPM match on 20/20 before continuing.

4. Perform bucket test for 1 minute total and compare Ounces Caught vs. Ounces Expected. (It is recommended to repeat this step 3 times and use an average of all tests.)
    a. Ounces Caught _____oz
    b. Multiply actual GPM from 20/20 ___GPM X 128= ____oz expected

5. If these values match, no flow rate adjustment is needed, continue to orifice sizing steps.

6. Calculate the % difference between caught value and measured value.
    a. (_____OZ Expected **-** _____OZ Caught)**/** _____OZ Caught **x** 100= _____%

7. Enter % Change calculated into the flow rate adjustment page.

vApply HD Flow Rate Adjustment_____%

Flowsense Flow Rate Adjustment =_____% x -1**=_____%**

Note- It is strongly recommended to run a bucket test (repeated 3 times) with the flow rate adjustment entered to verify accuracy.

Non-HD controlled orifice Verification Worksheet

Customer Name:_____
Date:_____
Product_____
Target Rate_____GPA
Planting Speed_____MPH
# of rows_____
Row Spacing_____Inches
Optimal Operating PSI_____PSI

1. Complete a flow rate adjustment for Flowsense before proceeding.
2. Set up Liquid Max stand to run customer's product through Flow Sense and orifice body and install charted orifice size.
    a. (____GPA X ____MPH X ___Application width)/5940=____GPM
    b. Customer's intended System Pressure ____PSI.
    c. _____Charted Orifice Size.

3. From the diagnose page, enter a manual test on Liquid Max and enter target ____GPA and ____MPH in tabs.
4. Use PWM% and bypass on Liquid max to set desired system pressure.
5. Measure actual GPM using Flow Sense _____GPM

6. Calculate the % difference between actual GPM and desired GPM.

    (_____GPM Desired**-** _____GPM Actual)**/** _____GPM Actual **x** 100=

        a. _____% difference.

7. Resize using % difference on charted orifice size by using calculation below.
    a. (1 + (___%difference/100)) x ___ charted orifice size=____adjusted size

8. Adjust Rate and speed to determine minimum and maximum GPM per orifice.

Results-

Adjusted Orifice Size	**___**
Target System Pressure	**___PSI**
Minimum GPM @ 10PSI	**___GPM**
Maximum GPM @ Customer's maximum system PSI	**___GPM**

Post vApply HD Orifice sizing Worksheet

Customer Name:_____
Date:_____
Product_____
Target Rate_____GPA
Planting Speed_____MPH
# of rows_____
Row Spacing_____Inches
Optimal Operating PSI_____PSI

Follow steps to find appropriate orifice size based on customer's rate and product.

1. Complete a flow rate adjustment for vApplyHD and Flow Sense(if applicable) before proceeding.
2. Find Target GPM per application point. (consider if each Furrowjet is 3 points, Dual Conceal is 2)
    a. (___GPA X ___MPH X ___Inch row width)**/** 5940= ___ Target GPM
    b. If more than 1 application point per row, divide target GPM by # of points. _____GPM/application point
    c. For some higher rates and thicker products, it may be necessary to oversize GPM from the orifice chart to find appropriate orifice size.
        In some instances, the percent increase could range from 10-30%+ (or more in edge cases) ____Oversized GPM
3. Use a target PSI that is **less** than Optimal System Pressure
    a. A good guideline is to divide System PSI by half.
        _____system PSI divided by 2=_____Adjusted PSI
4. Use Oversized Rate from step 2 and Adjusted PSI from step 3A to size orifice using manufacture's orifice chart
5. Verify on LiquidMax with Customer's product optimal orifice size.
    a. The system should be able to reach the customer's target GPM at with post vApply HD PSI above 10psi (30psi if running furrowjet) and below system pressure.
    b. Also make sure the ball valve position is well under 50 while running target GPM. This will ensure the vApply HD can still adjust flow hit target GPM.

Orifice Recommendation _____

Test Results
Maximum planting speed at customer's maximum target rate_____
Minimum planting speed at customer's minimum target rate _____
Maximum rate _____ @ AVG_____ mph
Minimum rate _____@ AVG_____mph

Orifice Plate Chart

	GPM						
	5 PSI	10 PSI	20 PSI	30 PSI	40 PSI	50 PSI	60 PSI
CP4916-008	0.003	0.004	0.006	0.007	0.008	0.009	0.010
CP4916-10	0.005	0.007	0.009	0.011	0.013	0.015	0.016
CP4916-12	0.007	0.010	0.013	0.016	0.019	0.021	0.023
CP4916-14	0.009	0.013	0.018	0.022	0.025	0.028	0.031
CP4916-15	0.010	0.015	0.021	0.025	0.029	0.032	0.036
CP4916-16	0.012	0.017	0.023	0.029	0.033	0.037	0.040
CP4916-18	0.015	0.021	0.030	0.036	0.042	0.047	0.051
CP4916-20	0.018	0.026	0.037	0.045	0.052	0.058	0.064
CP4916-22	0.022	0.031	0.043	0.053	0.061	0.068	0.075
CP4916-24	0.026	0.037	0.052	0.064	0.074	0.083	0.091
CP4916-25	0.028	0.040	0.056	0.068	0.079	0.088	0.097
CP4916-26	0.030	0.043	0.061	0.074	0.086	0.096	0.105
CP4916-27	0.032	0.046	0.064	0.079	0.091	0.102	0.111
CP4916-28	0.035	0.049	0.069	0.085	0.098	0.110	0.120
CP4916-29	0.038	0.054	0.076	0.094	0.108	0.121	0.132
CP4916-30	0.040	0.057	0.081	0.099	0.114	0.127	0.140
CP4916-31	0.043	0.062	0.087	0.107	0.123	0.138	0.151
CP4916-32	0.048	0.068	0.095	0.117	0.135	0.151	0.165
CP4916-34	0.052	0.074	0.104	0.127	0.147	0.164	0.180
CP4916-35	0.056	0.079	0.111	0.136	0.157	0.176	0.192
CP4916-37	0.061	0.086	0.122	0.149	0.172	0.192	0.211
CP4916-39	0.068	0.096	0.135	0.165	0.191	0.214	0.234
CP4916-40	0.072	0.102	0.144	0.177	0.204	0.228	0.250
CP4916-41	0.075	0.106	0.149	0.183	0.211	0.236	0.258
CP4916-43	0.082	0.116	0.163	0.200	0.231	0.258	0.283
CP4916-45	0.088	0.125	0.177	0.217	0.250	0.280	0.306
CP4916-46	0.095	0.135	0.191	0.234	0.270	0.302	0.331

	GPM						
	5 PSI	10 PSI	20 PSI	30 PSI	40 PSI	50 PSI	60 PSI
CP4916-47	0.097	0.138	0.194	0.238	0.275	0.307	0.337
CP4916-48	0.101	0.143	0.202	0.248	0.286	0.320	0.350
CP4916-49	0.104	0.148	0.209	0.255	0.295	0.330	0.361
CP4916-51	0.116	0.165	0.233	0.285	0.329	0.368	0.403
CP4916-52	0.118	0.168	0.237	0.290	0.335	0.375	0.410
CP4916-54	0.127	0.180	0.255	0.312	0.360	0.402	0.441
CP4916-55	0.133	0.189	0.267	0.326	0.377	0.421	0.462
CP4916-57	0.141	0.200	0.283	0.346	0.400	0.447	0.490
CP4916-59	0.153	0.217	0.306	0.375	0.433	0.484	0.530
CP4916-61	0.165	0.233	0.330	0.404	0.466	0.521	0.571
CP4916-63	0.174	0.246	0.347	0.425	0.491	0.549	0.601
CP4916-65	0.185	0.261	0.369	0.452	0.522	0.584	0.639
CP4916-67	0.196	0.278	0.392	0.481	0.555	0.621	0.680
CP4916-68	0.203	0.287	0.405	0.496	0.573	0.641	0.702
CP4916-70	0.216	0.306	0.433	0.530	0.612	0.684	0.750
CP4916-72	0.226	0.320	0.453	0.554	0.640	0.716	0.784
CP4916-73	0.233	0.330	0.467	0.572	0.660	0.738	0.808
CP4916-75	0.245	0.347	0.491	0.601	0.694	0.776	0.850
CP4916-78	0.272	0.385	0.544	0.667	0.770	0.861	0.943
CP4916-80	0.280	0.397	0.561	0.687	0.793	0.887	0.971
CP4916-81	0.290	0.411	0.581	0.711	0.821	0.918	1.01
CP4916-83	0.317	0.449	0.634	0.777	0.897	1.00	1.10
CP4916-86	0.332	0.470	0.664	0.813	0.939	1.05	1.15
CP4916-89	0.346	0.490	0.693	0.849	0.980	1.10	1.20
CP4916-91	0.369	0.523	0.739	0.905	1.05	1.17	1.28
CP4916-93	0.387	0.547	0.774	0.947	1.09	1.22	1.34
CP4916-95	0.404	0.572	0.808	0.990	1.14	1.28	1.40

	GPM						
	5 PSI	10 PSI	20 PSI	30 PSI	40 PSI	50 PSI	60 PSI
CP4916-98	0.442	0.625	0.884	1.08	1.25	1.40	1.53
CP4916-103	0.461	0.653	0.923	1.13	1.31	1.46	1.60
CP4916-107	0.518	0.733	1.04	1.27	1.47	1.64	1.79
CP4916-110	0.548	0.775	1.10	1.34	1.55	1.73	1.90
CP4916-115	0.605	0.855	1.21	1.48	1.71	1.91	2.09
CP4916-120	0.629	0.890	1.26	1.54	1.78	1.99	2.18
CP4916-125	0.693	0.980	1.39	1.70	1.96	2.19	2.40
CP4916-128	0.721	1.02	1.44	1.77	2.04	2.28	2.50
CP4916-132	0.774	1.10	1.55	1.90	2.19	2.45	2.68
CP4916-136	0.840	1.19	1.68	2.06	2.38	2.66	2.91
CP4916-140	0.894	1.27	1.79	2.19	2.53	2.83	3.10
CP4916-144	0.926	1.31	1.85	2.27	2.62	2.93	3.21
CP4916-147	0.953	1.35	1.91	2.33	2.70	3.01	3.30
CP4916-151	1.04	1.47	2.08	2.55	2.94	3.29	3.60
CP4916-156	1.10	1.55	2.20	2.69	3.11	3.47	3.80
CP4916-161	1.15	1.63	2.31	2.83	3.27	3.65	4.00
CP4916-166	1.21	1.72	2.43	2.97	3.43	3.84	4.20
CP4916-170	1.30	1.84	2.61	3.19	3.69	4.12	4.51
CP4916-172	1.36	1.92	2.71	3.32	3.84	4.29	4.70
CP4916-177	1.41	2.00	2.83	3.46	4.00	4.47	4.90
CP4916-182	1.47	2.08	2.95	3.61	4.17	4.66	5.10
CP4916-187	1.56	2.21	3.12	3.82	4.41	4.93	5.40
CP4916-196	1.73	2.45	3.46	4.24	4.90	5.47	6.00
CP4916-205	1.88	2.65	3.75	4.59	5.31	5.93	6.50
CP4916-218	2.11	2.98	4.21	5.16	5.96	6.66	7.30
CP4916-234	2.45	3.47	4.91	6.01	6.94	7.76	8.50
CP4916-250	2.83	4.00	5.66	6.93	8.00	8.94	9.80