APPLICATIONS OF UAVs IN PLANTATION AGRONOMY

GEO SMART ASIA 2016

SMART AGRICULTURE, PLANTATION AND FISHERIES

18th October 2016

Khoo Hock Aun
Managing Director, Cosmo Biofuels Group/
Director, GROW Centre

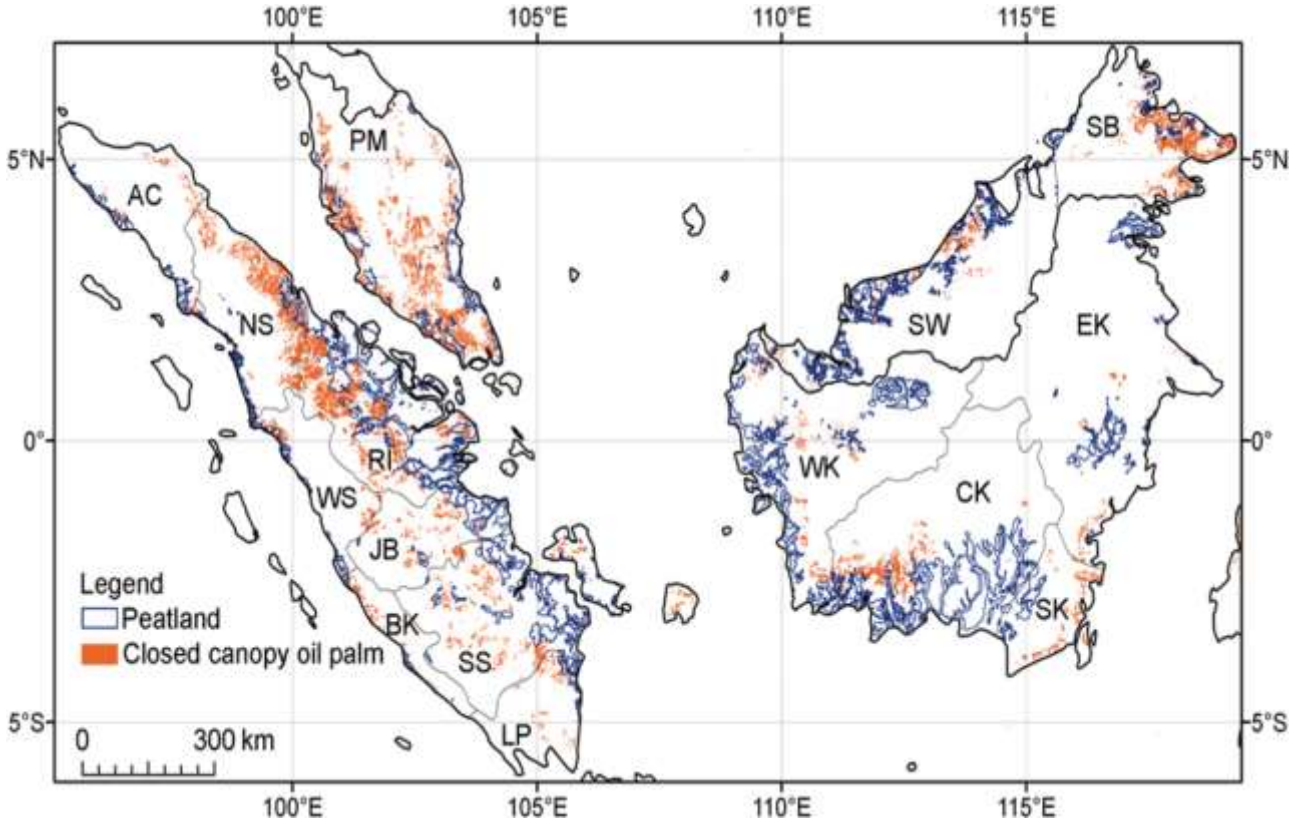
Aker

COSMO
BIOFUELS GROUP

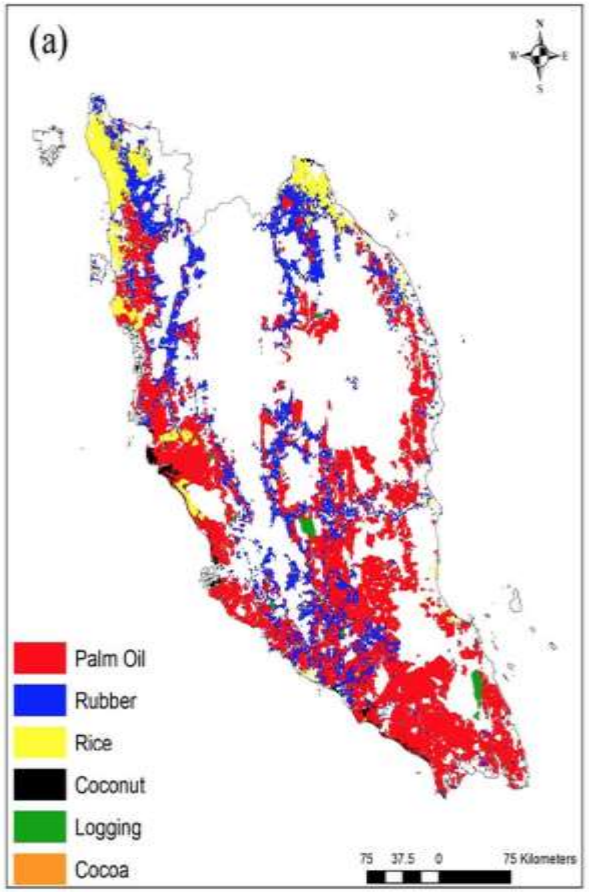
THE GROW CENTRE

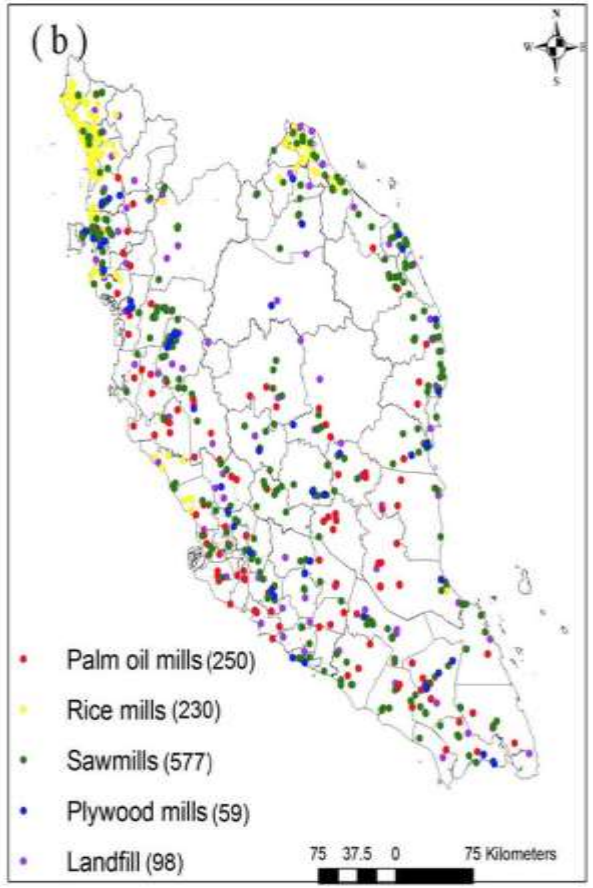
GREEN RENEWABLE ORGANIC WORLD CENTRE SDN BHD 1096665-K

Distribution Of Closed Canopy Oil Palm Plantations In The Lowlands Of Peninsular Malaysia, Borneo And Sumatra



Distribution of Plantation Crops and Processing Mills in Peninsular Malaysia





UAV Best Practices

Directed crop scouting

Drainage planning & remediation

Seed and spraying prescriptions

Yield prediction

Management zones

Software Platform

Flight logistics, image processing

Agronomy layering and in-season stress analytics

Mobile directed-scouting

Lead generation for input retailers

In-season regional intelligence

Unique Service Proposition:

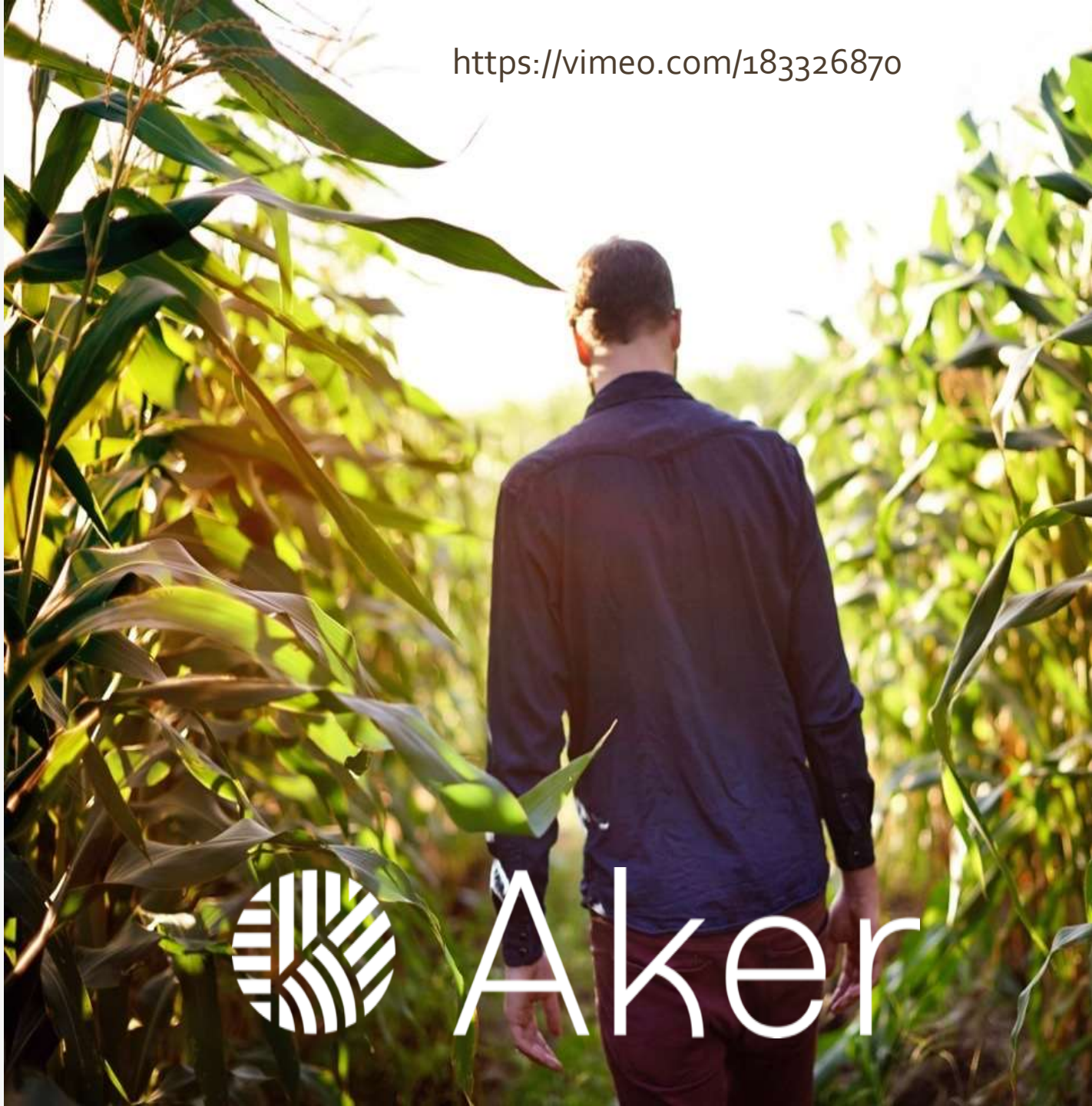
New Precision Crop Yield Protection Monitoring Service by Chicago based Aker

High resolution image collection, identification of crop stress and classification of cause to address in-season issues and better crop/land management.

Results are delivered via web SaaS dashboard, API and mobile app that include field plant health scouting zones, crop fertility and disease issues.

Results are dramatically a more accurate health impact that can be used for improve prescription and management zones.

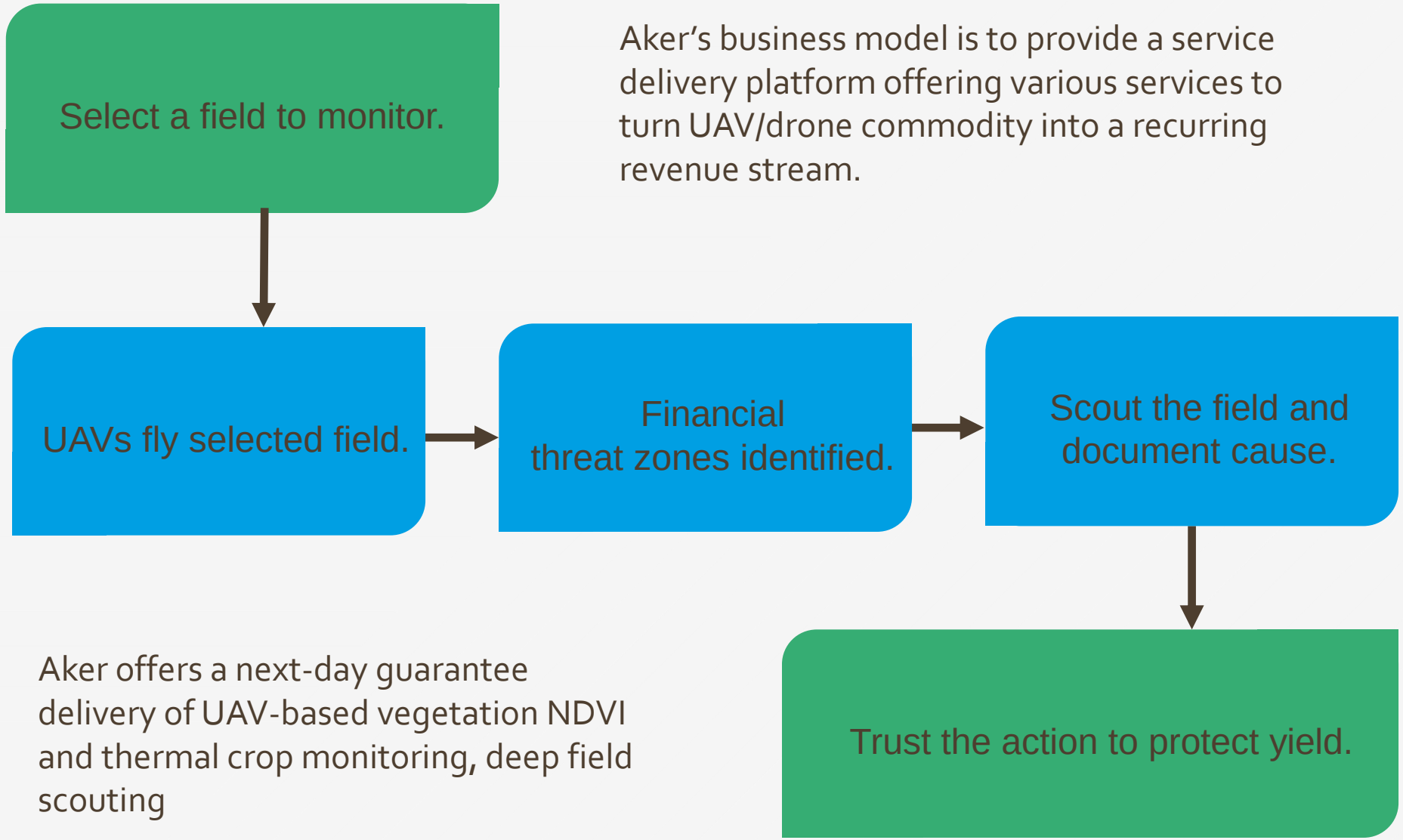
https://vimeo.com/183326870



How it works

The agriculture industry loses millions of dollars to crop disease, pests and poor field management.

Most fertilizer, herbicide and pesticide decisions are based on imperfect information, last year modeling, equipment failure and outdated (or low resolution) environmental data



Aker's business model is to provide a service delivery platform offering various services to turn UAV/drone commodity into a recurring revenue stream.

Aker offers a next-day guarantee delivery of UAV-based vegetation NDVI and thermal crop monitoring, deep field scouting

Directed Scouting Metrics

Scouting cost include 3 flights per season

Financial yield threat from crop scouting based on 100K+ acres benchmark in 2015 & 2016

Direct impact

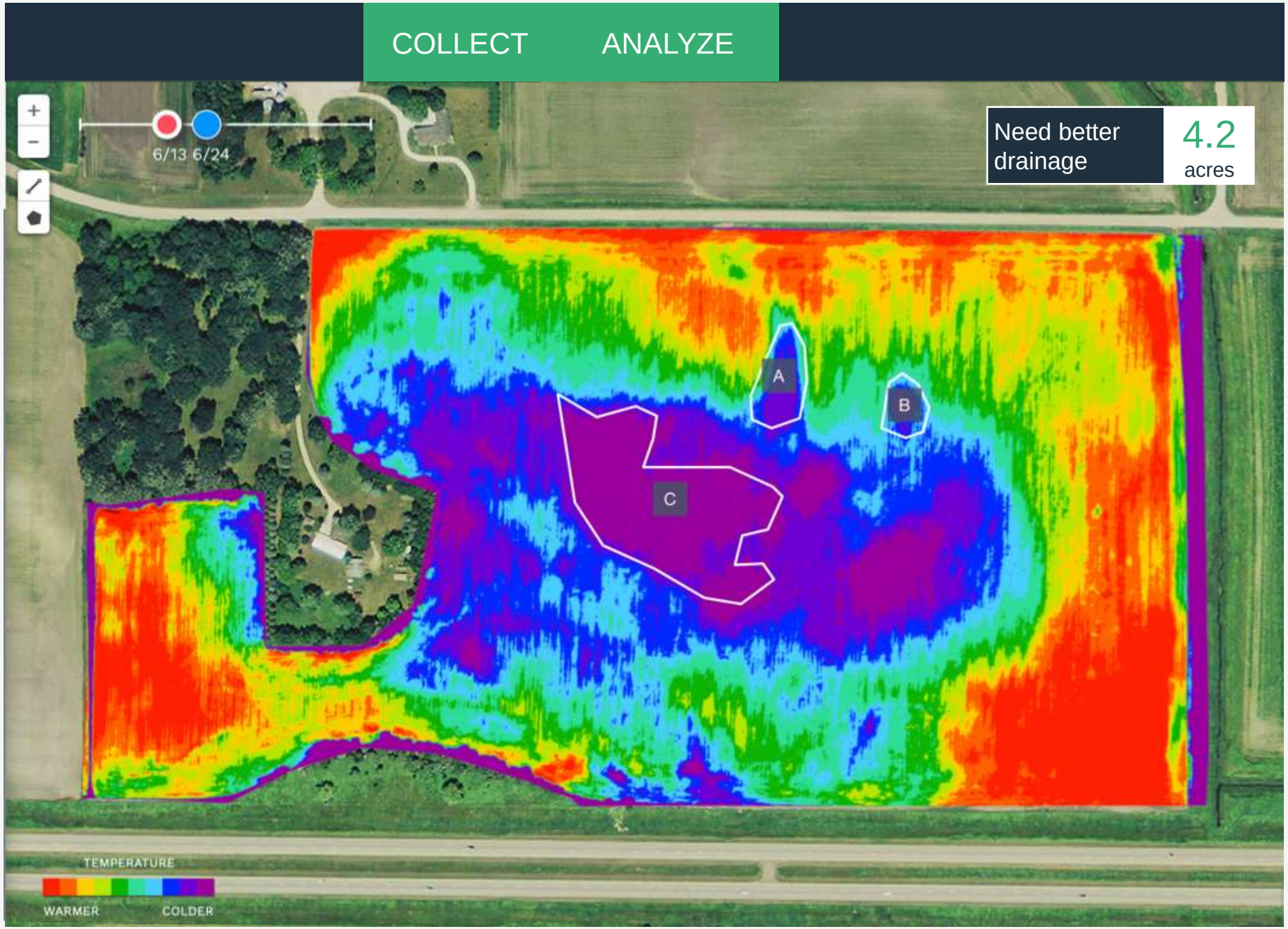
	Corn	Soy
Value/acre	$780	$547
Scouting cost/acre	$6.00	$6.00
Scouting zone	13%	11%
Yield Threat	15%	20%
Direct impact	$15.21	$12.04
ROI	**154%**	**101%**

Monitoring Services

Field H

Thermal – Jun 13
Bare / 64.34 acres

http://discover.aker.ag
u: demo@aker.ag
p: akeraker

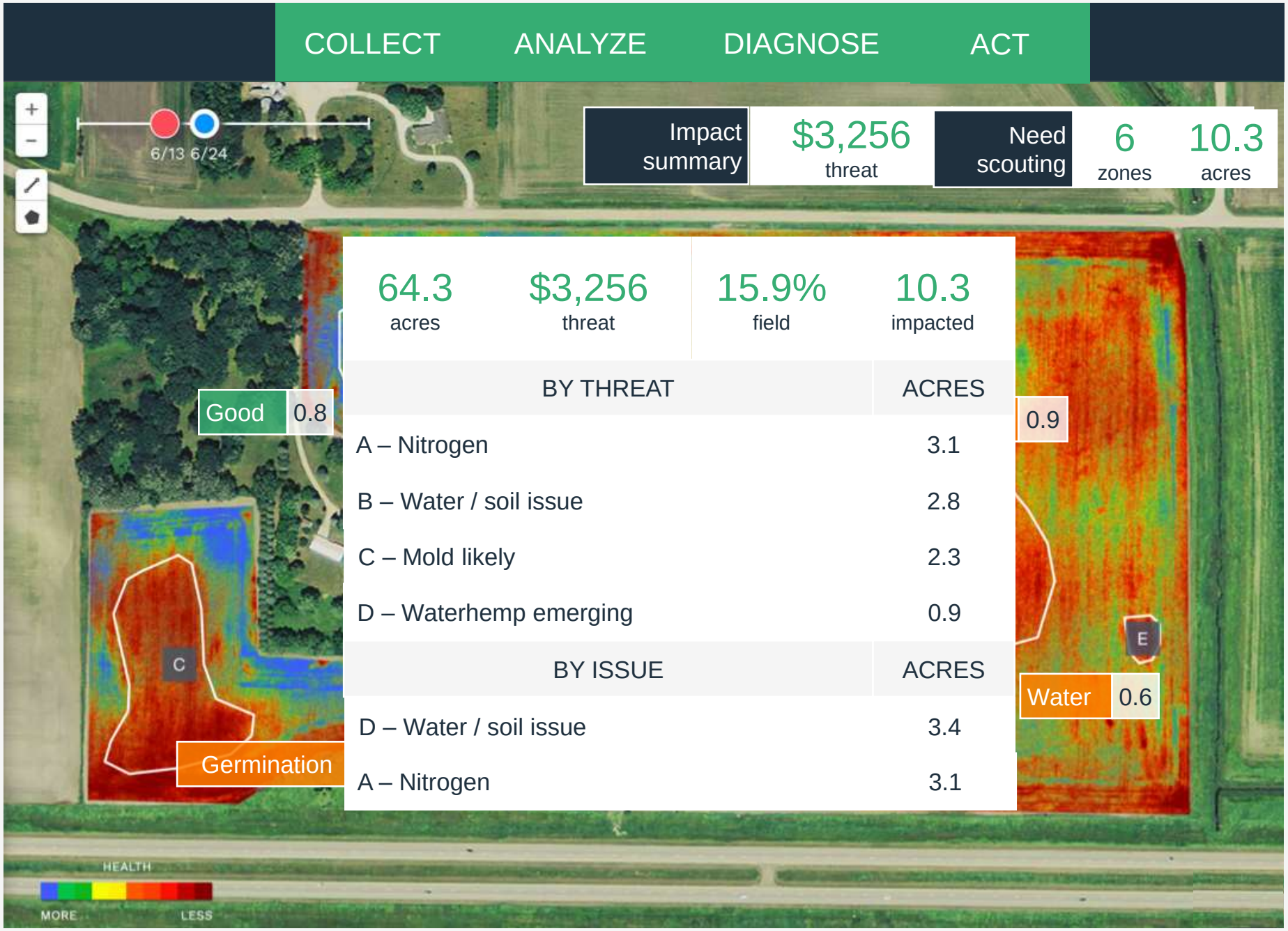


Monitoring Services

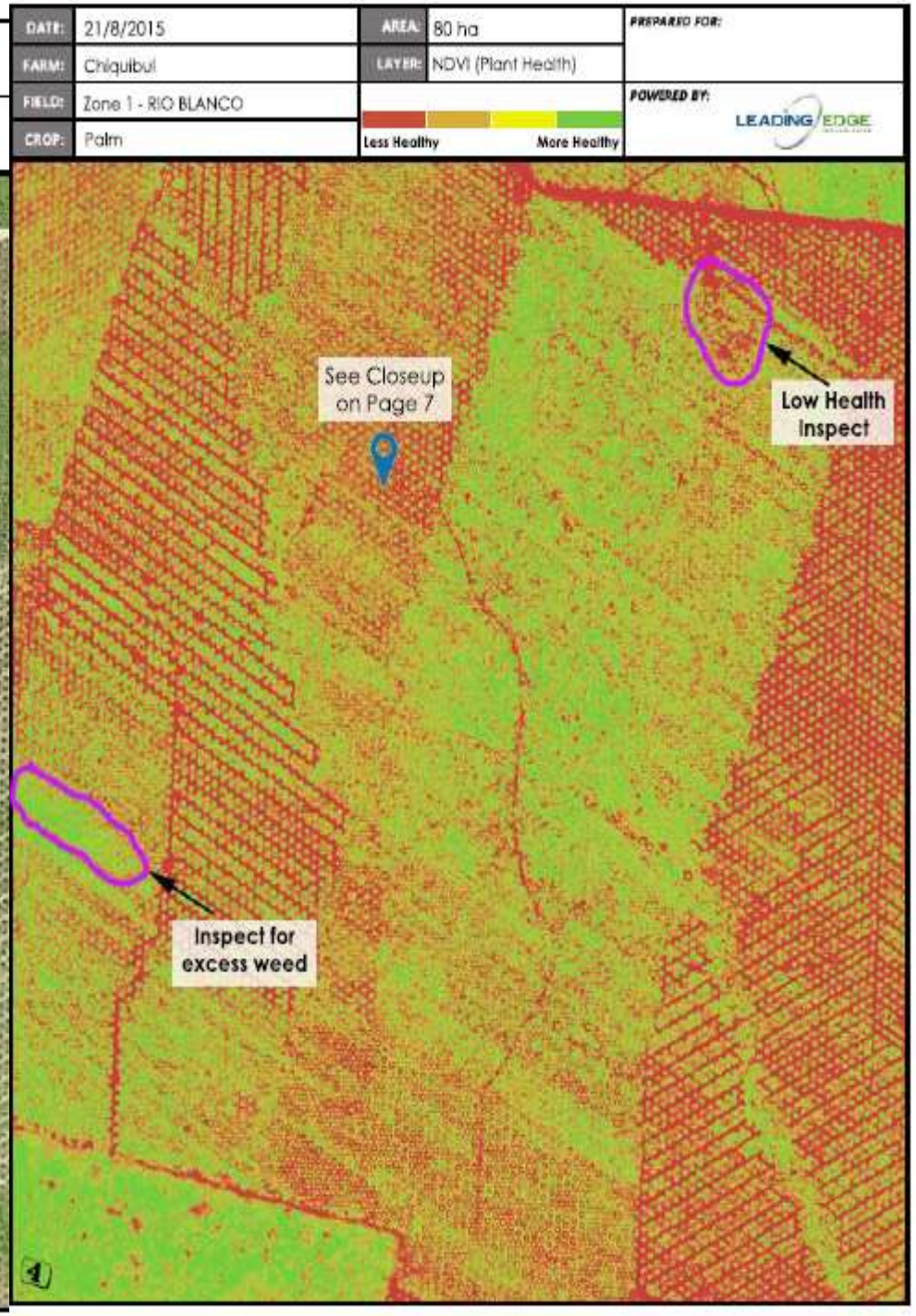
Field H

NDVI – Jun 24

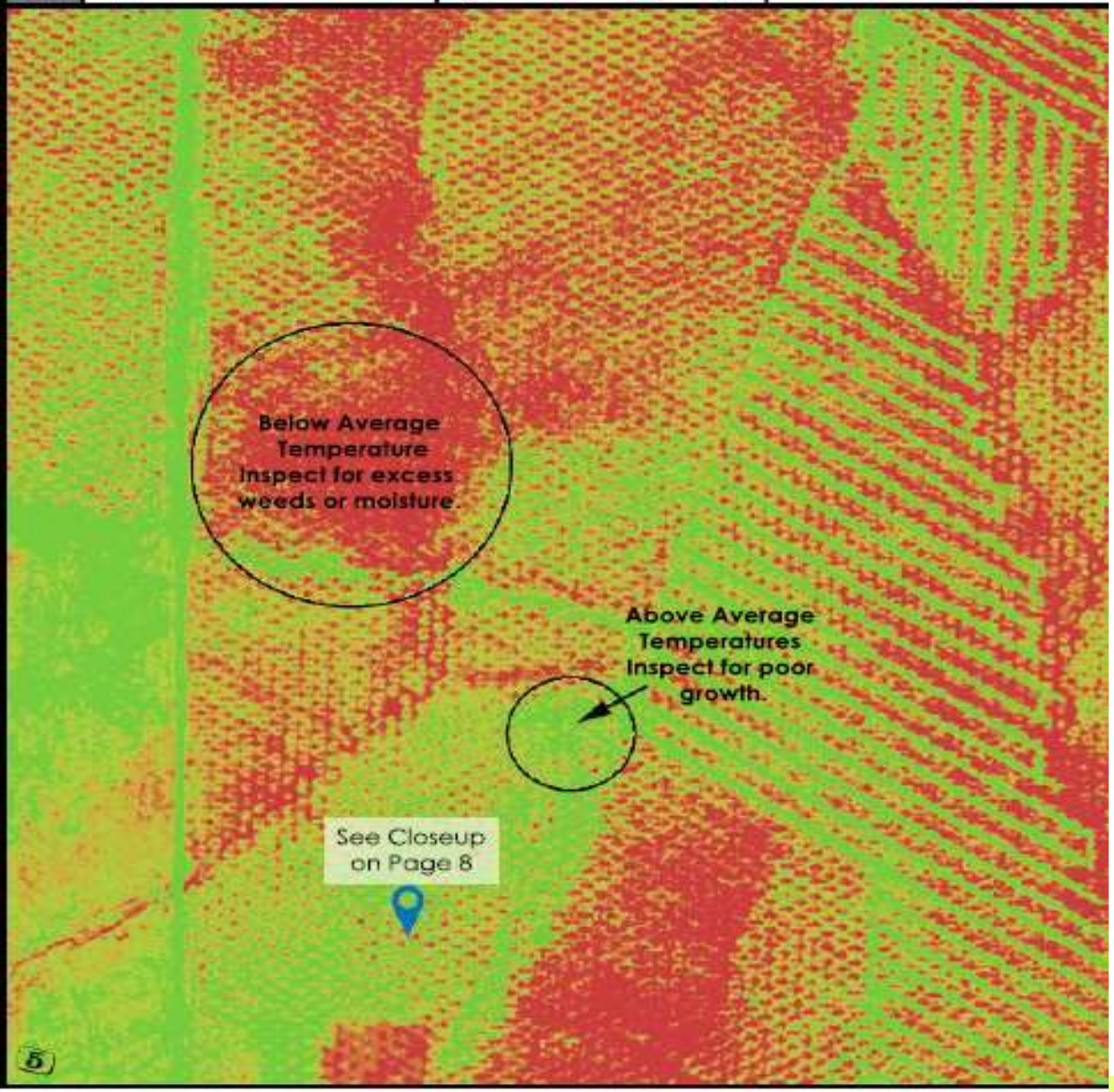
Corn / 64.34 acres



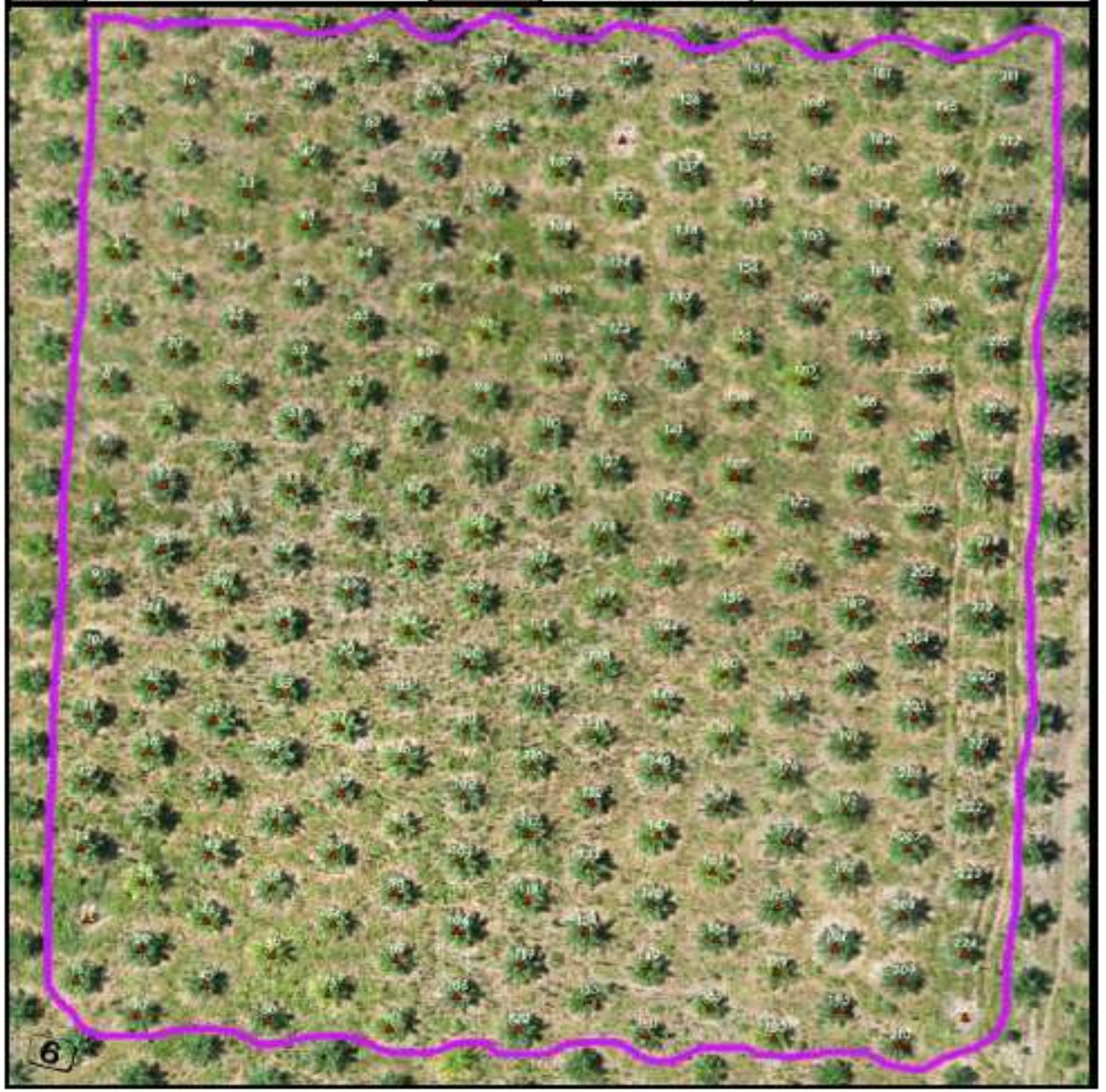
SAMPLE PLANT HEALTH REPORT FOR OIL PALM



DATE:	Aug 21, 2015	AREA:	42 ha	PREPARED FOR:	
FARM:	Chiquibul	LAYER:	Thermal		
FIELD:	Zone 1 - RIO BLANCO	Degrees (Celsius)		POWERED BY:	LEADING EDGE
CROP:	Palm	32	36 40 44		



DATE:	Aug 21, 2015	AREA:	1.6 ha	FOR:	
FARM:	Chiquibul	LAYER:	RGB Ortho (Closeup)		
FIELD:	Zone 1 - RIO BLANCO	DENSITY:	140 Palm / ha	BY:	LEADING EDGE
CROP:	Palm	RESOLUTION:	6 cm / px (0.06 m)		



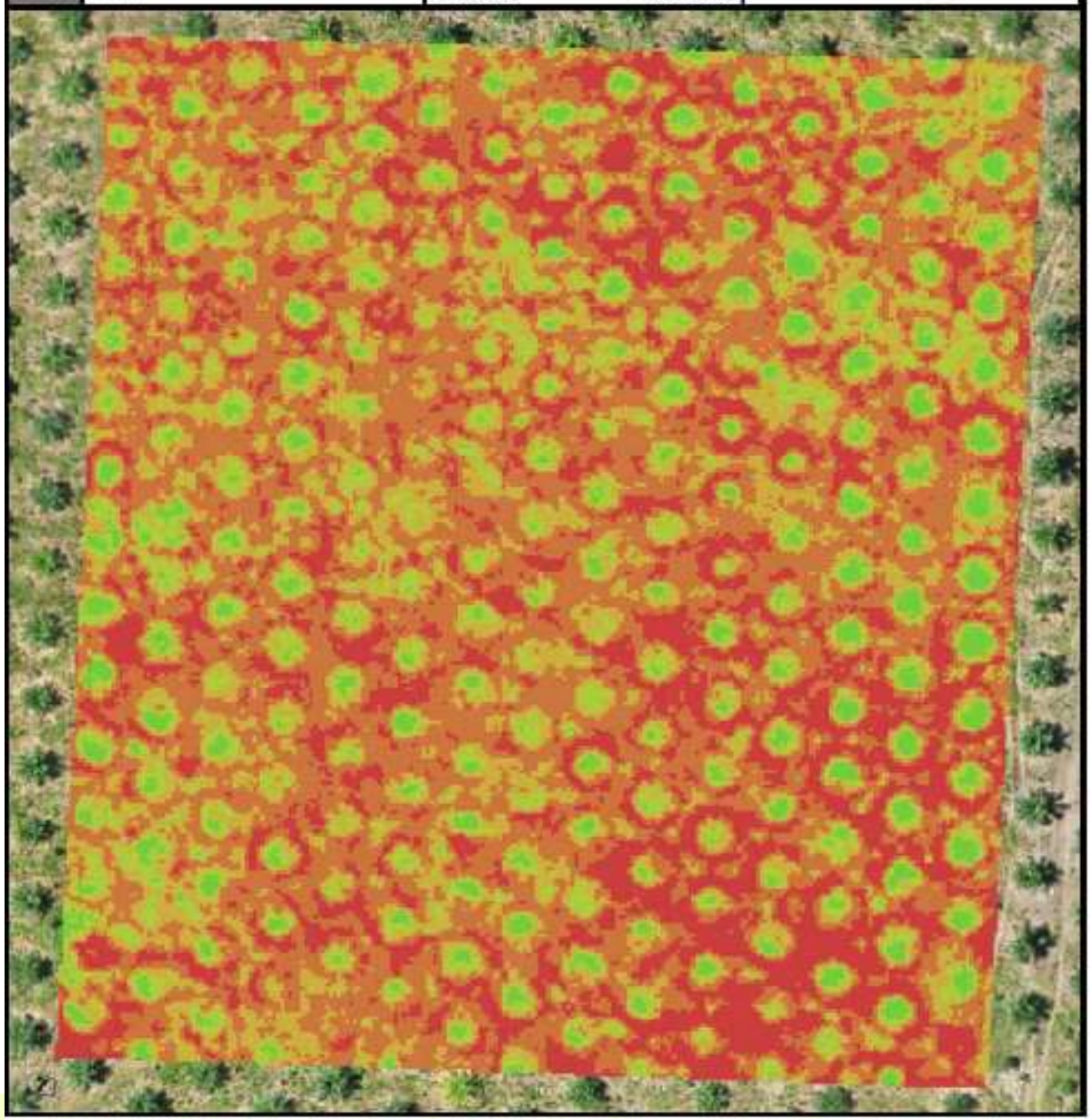
DATE:	Aug 21, 2015
FARM:	Chiquibul
FIELD:	Zone 1 - RIO BLANCO
CROP:	Palm

AREA:	1.6 ha
LAYER:	NDVI (Closeup)

Less Healthy — More Healthy

PREPARED FOR:

POWERED BY: LEADING EDGE



DATE:	Aug 21, 2015
FARM:	Chiquibul
FIELD:	Zone 1 - RIO BLANCO
CROP:	Palm

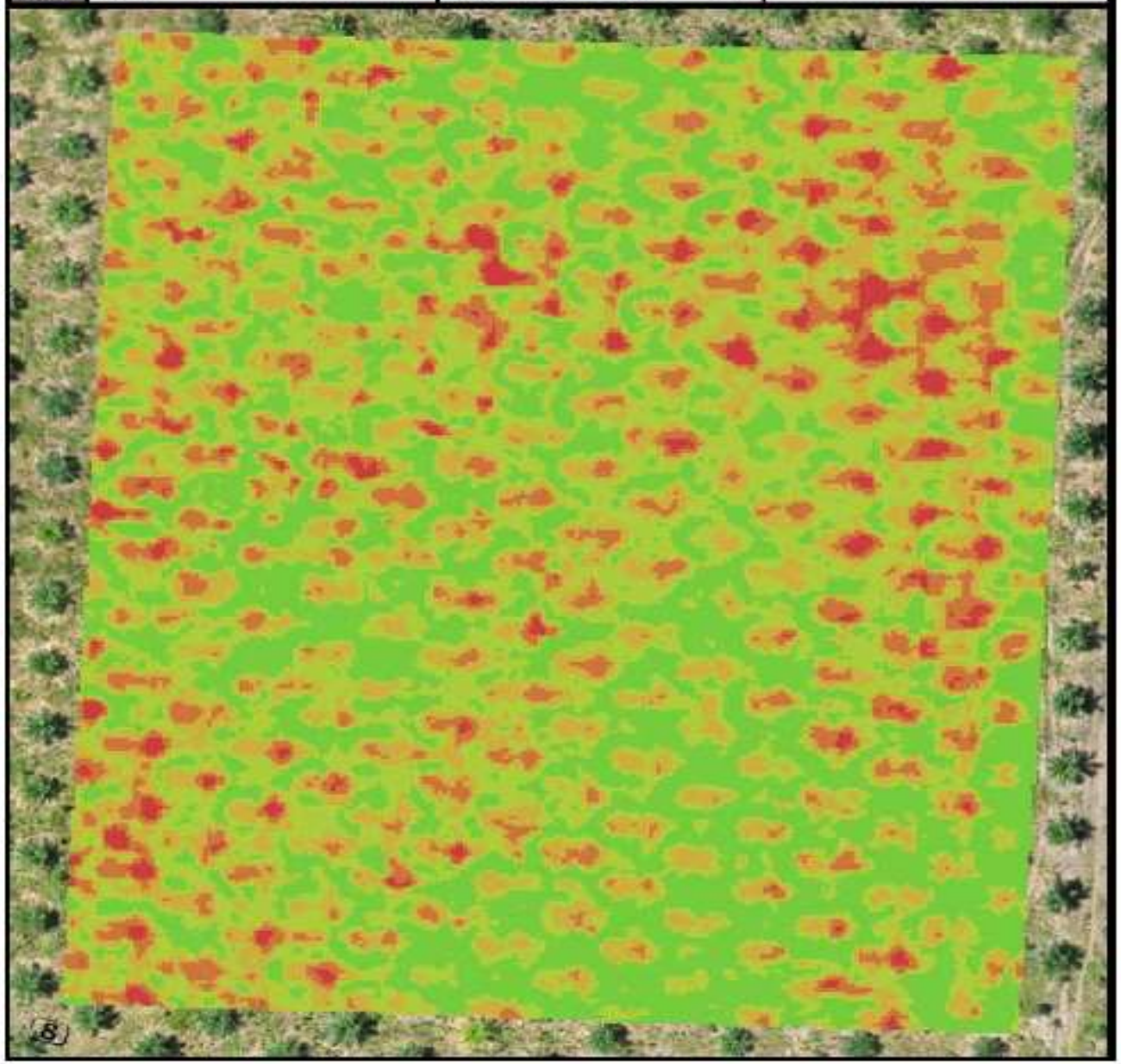
AREA:	1.6 ha
LAYER:	Thermal (Closeup)

Degrees (Celsius)

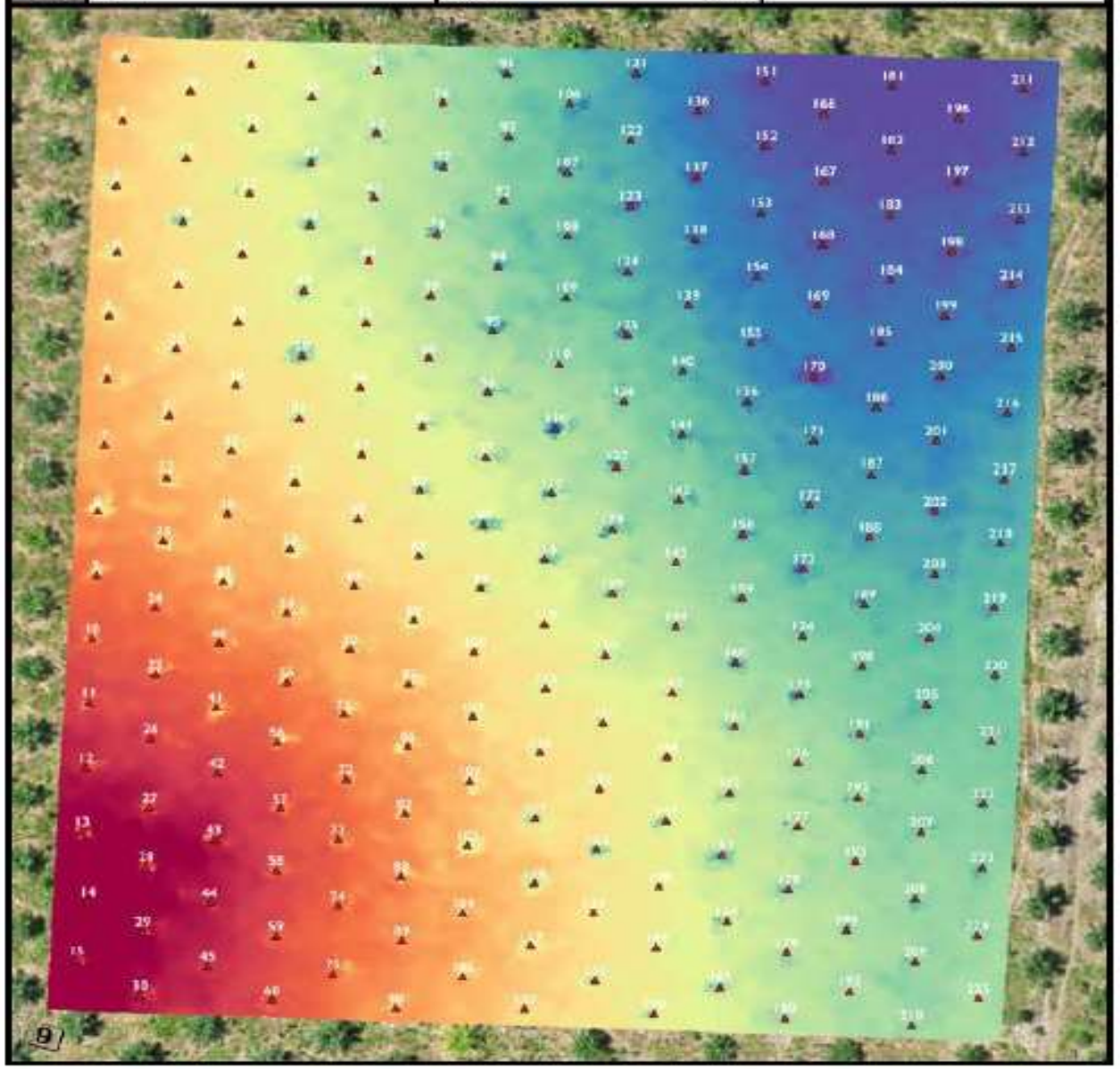
32 — 36 — 40 — 44

PREPARED FOR:

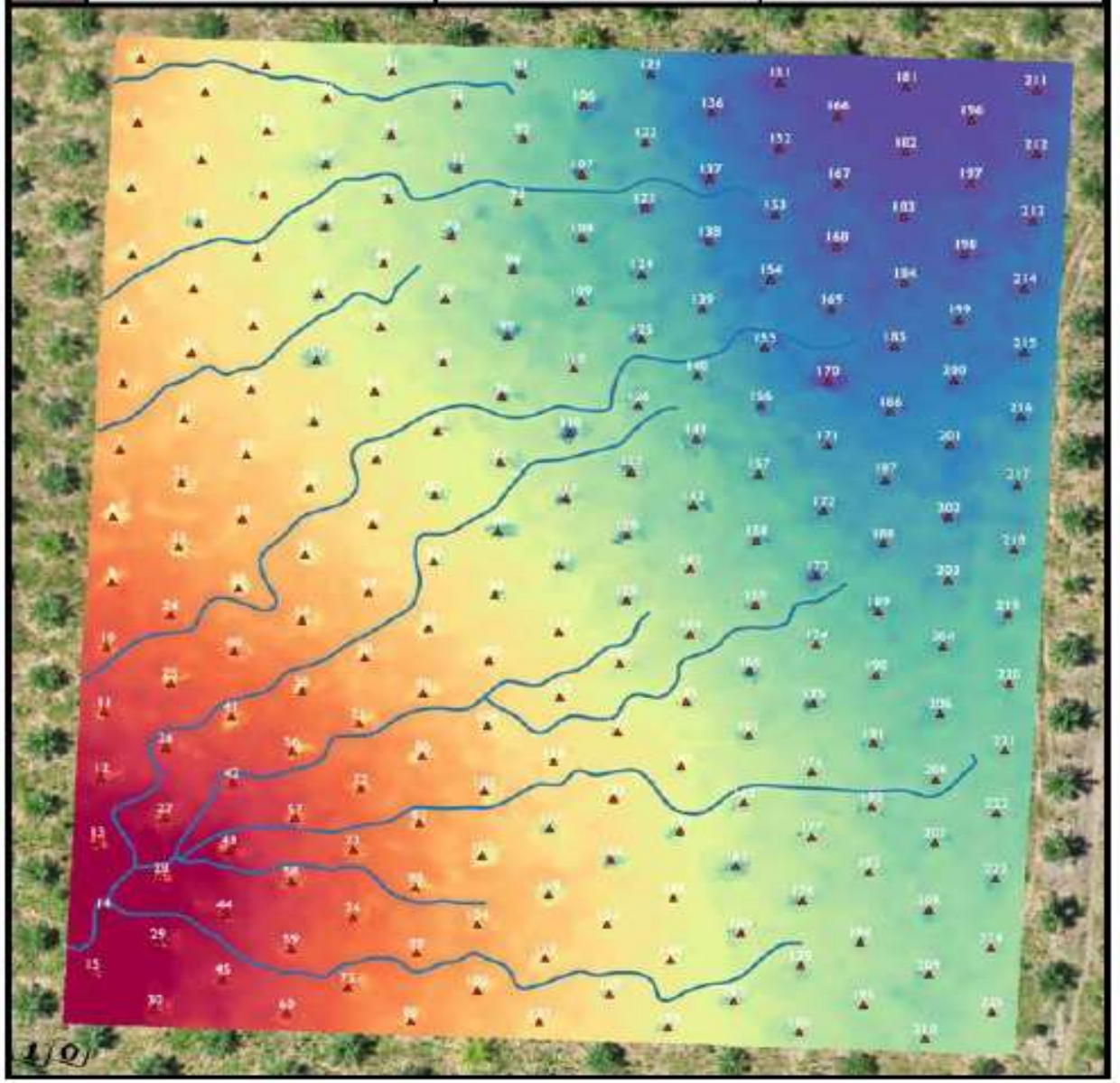
POWERED BY: LEADING EDGE



DATE:	Aug 21, 2015	AREA:	1.6 ha	PREPARED FOR:
FARM:	Chiquibul	LAYER:	Digital Surface Model	
FIELD:	Zone 1 - RIO BLANCO	Elevation		POWERED BY: LEADING EDGE
CROP:	Palm	189 m	202 m	



DATE:	Aug 21, 2015	AREA:	1.6 ha	PREPARED FOR:
FARM:	Chiquibul	LAYER:	Watershed	
FIELD:	Zone 1 - RIO BLANCO	Elevation		POWERED BY: LEADING EDGE
CROP:	Palm	189 m	202 m	



DATE:	21-Aug-15	AREA:	1.6 Ha	FOR:
FARM:	Chiquibul	LAYER:	Tree Count Data	
FIELD:	Rio Blanco	DENSITY:	140 Palm / Ha	
CROP:	Palm	Healthy Unhealthy Attention		BY: LEADING EDGE

Tree ID	Longitude	Latitude	Tree Height (meters)	Plant Health	Temperature (Celsius)	Tree Present
1	15.89943350	-90.19865336	3.114	0.57988	39.95429	Yes
2	15.89935541	-90.19865790	0.097	0.71626	39.87571	Yes
3	15.89927402	-90.19866595	2.717	0.73812	39.54838	Yes
4	15.89919028	-90.19866595	1.173	0.76914	38.71057	Yes
5	15.89911115	-90.19867628	1.426	0.61937	37.36312	Yes
6	15.89903081	-90.19867970	0.586	0.77494	38.30945	Yes
7	15.89894825	-90.19868430	0.415	0.67643	37.04525	Yes
8	15.89886687	-90.19869351	1.880	0.75415	39.28206	Yes
9	15.89878651	-90.19869577	2.535	0.69294	39.66802	Yes
10	15.89870620	-90.19870150	3.354	0.78740	38.34472	Yes
11	15.89862588	-90.19870607	2.499	0.72558	40.61785	Yes
12	15.89854444	-90.19871066	1.906	0.70393	36.82996	Yes
13	15.89846413	-90.19871639	0.831	0.75799	37.76170	Yes
14	15.89837474	-90.19871071	0.204	0.40298	37.82104	Yes
15	15.89830011	-90.19872443	0.425	0.76337	36.15129	Yes
16	15.89939125	-90.19858011	0.590	0.68792	40.74449	Yes
17	15.89930759	-90.19858588	0.352	0.70605	41.04425	Yes
18	15.89922838	-90.19859044	3.043	0.77113	37.92549	Yes
19	15.89914808	-90.19859732	0.295	0.60286	37.73205	Yes
20	15.89906774	-90.19860074	0.638	0.71473	40.16169	Yes
21	15.89898524	-90.19860996	3.098	0.74071	37.23576	Yes
22	15.89890827	-90.19861448	1.624	0.76431	38.14531	Yes
23	15.89882906	-90.19861904	2.225	0.74511	37.67444	Yes
24	15.89874434	-90.19862944	0.361	0.78854	38.62032	Yes
25	15.89866063	-90.19863060	0.899	0.69668	39.52259	Yes
26	15.89858031	-90.19863633	0.414	0.77288	37.31071	Yes
27	15.89849326	-90.19863869	3.521	0.77498	36.83451	Yes
28	15.89841853	-90.19864434	2.938	0.70061	38.66168	Yes
29	15.89833598	-90.19864894	2.386	0.70843	38.36994	Yes
30	15.89825565	-90.19865352	0.634	0.79832	36.76913	Yes
31	15.89942495	-90.19851042	0.275	0.74530	37.15673	Yes
32	15.89934345	-90.19851039	0.467	0.64011	38.00933	Yes
33	15.89926312	-90.19851497	0.246	0.69640	38.00507	Yes
34	15.89918509	-90.19852412	1.622	0.67471	37.69759	Yes
35	15.89910143	-90.19852990	0.286	0.67575	39.15397	Yes
36	15.89902109	-90.19853332	2.729	0.77074	38.57748	Yes
37	15.89893968	-90.19854021	1.652	0.76655	42.97058	Yes
38	15.89886160	-90.19854591	0.399	0.75289	38.20237	Yes
39	15.89877683	-90.19855170	2.848	0.79405	38.85641	Yes

DATE:	21-Aug-15	AREA:	1.6 Ha	FOR:
FARM:	Chiquibul	LAYER:	Tree Count Data	
FIELD:	Rio Blanco	DENSITY:	140 Palm / Ha	
CROP:	Palm	Healthy Unhealthy Attention		BY: LEADING EDGE

Tree ID	Longitude	Latitude	Tree Height (meters)	Plant Health	Temperature (Celsius)	Tree Present
40	15.89869875	-90.19855740	3.052	0.72022	38.96307	Yes
41	15.89861843	-90.19856197	2.163	0.80657	39.02943	Yes
42	15.89853581	-90.19856196	0.430	0.76392	40.54877	Yes
43	15.89845213	-90.19856658	3.107	0.71373	38.18367	Yes
44	15.89837182	-90.19857231	0.260	0.68712	40.06609	Yes
45	15.89829148	-90.19857573	0.298	0.73725	36.99445	Yes
46	15.89938275	-90.19844178	0.457	0.67531	38.52185	Yes
47	15.89930016	-90.19844408	2.562	0.72746	40.21625	Yes
48	15.89922204	-90.19844632	2.807	0.73184	38.01647	Yes
49	15.89913953	-90.19845438	2.169	0.81755	40.39034	Yes
50	15.89905696	-90.19845783	2.762	0.80360	38.75444	Yes
51	15.89897998	-90.19846236	0.413	0.68725	38.92149	Yes
52	15.89890079	-90.19846807	1.184	0.77876	38.53588	Yes
53	15.89881714	-90.19847500	1.151	0.60607	38.00480	Yes
54	15.89873570	-90.19847959	3.253	0.76349	41.95737	Yes
55	15.89864863	-90.19848079	2.521	0.74087	37.33472	Yes
56	15.89857399	-90.19849336	3.548	0.75679	39.69379	Yes
57	15.89849023	-90.19849106	0.951	0.73355	38.73701	Yes
58	15.89841215	-90.19849676	1.413	0.70277	40.31279	Yes
59	15.89832843	-90.19849792	1.023	0.61651	36.40292	Yes
60	15.89824812	-90.19850365	0.811	0.81331	38.50044	Yes
61	15.89941527	-90.19836634	0.201	0.74327	36.76289	Yes
62	15.89933603	-90.19836860	0.953	0.75562	38.84954	Yes
63	15.89925570	-90.19837317	1.518	0.69435	39.10778	Yes
64	15.89917541	-90.19838005	0.031	0.77250	39.68965	Yes
65	15.89909843	-90.19838458	0.246	0.66254	39.00188	Yes
66	15.89901703	-90.19839263	0.389	0.72441	39.06016	Yes
67	15.89893217	-90.19839150	0.634	0.72498	38.75950	Yes
68	15.89885409	-90.19839719	0.370	0.66899	39.05148	Yes
69	15.89876932	-90.19840298	2.681	0.71507	39.19099	Yes
70	15.89868901	-90.19840871	0.390	0.81779	40.90880	Yes
71	15.89860761	-90.19841676	3.029	0.73512	40.76599	Yes
72	15.89852609	-90.19841558	1.274	0.73126	38.46818	Yes
73	15.89845031	-90.19842586	1.543	0.69623	38.34845	Yes
74	15.89836547	-90.19842703	1.962	0.66970	38.63860	Yes
75	15.89827960	-90.19843399	0.533	0.64166	39.38351	Yes
76	15.89937302	-90.19829425	0.989	0.69744	40.76108	Yes
77	15.89929264	-90.19829421	3.416	0.73357	38.74598	Yes
78	15.89920901	-90.19830229	2.583	0.68755	37.92255	Yes

DATE:	21-Aug-15	AREA:	1.6 Ha	FOR:
FARM:	Chiquibul	LAYER:	Tree Count Data	
FIELD:	Rio Blanco	DENSITY:	140 Palm / Ha	
CROP:	Palm	Healthy Unhealthy Attention		BY: LEADING EDGE

Tree ID	Longitude	Latitude	Tree Height (meters)	Plant Health	Temperature (Celsius)	Tree Present
79	15.89913096	-90.19831029	0.232	0.72175	38.65263	Yes
80	15.89905174	-90.19831370	0.546	0.62373	37.95574	Yes
81	15.89896699	-90.19832179	2.226	0.69552	38.58707	Yes
82	15.89888890	-90.19832634	2.734	0.72868	40.89631	Yes
83	15.89880631	-90.19832863	1.151	0.73351	38.31141	Yes
84	15.89872490	-90.19833553	1.720	0.70738	39.38704	Yes
85	15.89864461	-90.19834241	1.253	0.77495	39.74656	Yes
86	15.89856648	-90.19834465	1.460	0.71120	38.16843	Yes
87	15.89848169	-90.19834928	1.695	0.67260	38.78094	Yes
88	15.89840250	-90.19835499	3.047	0.79997	37.10895	Yes
89	15.89832100	-90.19835497	0.460	0.77702	43.07208	Yes
90	15.89823625	-90.19836306	2.408	0.70400	38.19076	Yes
91	15.89941002	-90.19821990	2.458	0.65758	41.51477	Yes
92	15.89932963	-90.19821986	1.059	0.67727	39.07113	Yes
93	15.89924934	-90.19822674	0.239	0.58547	43.08579	Yes
94	15.89916681	-90.19823365	2.574	0.73139	39.42021	Yes
95	15.89908540	-90.19824055	2.440	0.66630	38.05595	Yes
96	15.89900845	-90.19824738	2.541	0.71902	38.03979	Yes
97	15.89892700	-90.19825082	0.948	0.70312	37.93477	Yes
98	15.89884442	-90.19825427	2.743	0.68398	38.23089	Yes
99	15.89876410	-90.19825884	3.456	0.77542	38.83776	Yes
100	15.89868382	-90.19826688	0.664	0.76376	39.21686	Yes
101	15.89860348	-90.19827030	1.702	0.67228	38.71013	Yes
102	15.89852204	-90.19827489	1.567	0.85796	38.98271	Yes
103	15.89844058	-90.19827832	2.910	0.82230	39.36990	Yes
104	15.89835470	-90.19828528	1.203	0.81044	38.83509	Yes
105	15.89827433	-90.19828640	0.483	0.69646	42.15100	Yes
106	15.89937004	-90.19815008	0.130	0.77081	42.35508	Yes
107	15.89928411	-90.19815358	2.418	0.65628	37.17126	Yes
108	15.89920486	-90.19815468	0.455	0.82884	39.51708	Yes
109	15.89912674	-90.19815691	0.583	0.71300	38.46419	Yes
110	15.89904312	-90.19816615	0.377	0.72562	40.22280	Yes
111	15.89896280	-90.19817072	3.327	0.68233	38.01751	Yes
112	15.89888361	-90.19817643	3.572	0.72138	40.16557	Yes
113	15.89879999	-90.19818567	1.888	0.68795	38.27426	Yes
114	15.89871851	-90.19818680	0.439	0.70172	40.64452	Yes
115	15.89863700	-90.19818677	1.165	0.71636	38.07913	Yes
116	15.89855672	-90.19819480	2.837	0.73047	39.05270	Yes
117	15.89847418	-90.19820056	2.981	0.64553	38.44348	Yes

DATE:	21-Aug-15	AREA:	1.6 Ha	FOR:
FARM:	Chiquibul	LAYER:	Tree Count Data	
FIELD:	Rio Blanco	DENSITY:	140 Palm / Ha	
CROP:	Palm	Healthy Unhealthy Attention		BY: LEADING EDGE

Tree ID	Longitude	Latitude	Tree Height (meters)	Plant Health	Temperature (Celsius)	Tree Present
118	15.89839159	-90.19820286	2.338	0.80961	40.00224	Yes
119	15.89831240	-90.19820857	0.523	0.73690	39.33250	Yes
120	15.89823324	-90.19821659	0.968	0.72434	41.58248	Yes
121	15.89940812	-90.19807341	0.443	0.53043	39.34104	Yes
122	15.89932336	-90.19808035	0.012	0.40425	39.23323	No
123	15.89924077	-90.19808265	1.737	0.73459	39.66882	Yes
124	15.89915933	-90.19808724	0.636	0.78482	39.00688	Yes
125	15.89907896	-90.19808835	3.056	0.79400	38.94130	Yes
126	15.89899528	-90.19809297	0.941	0.69169	38.75748	Yes
127	15.89891502	-90.19810216	1.449	0.77228	38.69655	Yes
128	15.89883696	-90.19810901	1.072	0.77172	38.27635	Yes
129	15.89875547	-90.19811014	1.440	0.74145	38.50138	Yes
130	15.89867742	-90.19811814	0.838	0.65878	38.65535	Yes
131	15.89859373	-90.19812161	0.424	0.75225	39.70072	Yes
132	15.89851007	-90.19812738	0.563	0.81455	40.65103	Yes
133	15.89843421	-90.19813190	3.171	0.70962	39.02520	Yes
134	15.89835277	-90.19813649	1.018	0.79546	40.47445	Yes
135	15.89826791	-90.19813535	2.310	0.68208	42.24432	Yes
136	15.89935921	-90.19800372	0.586	0.79872	39.18201	Yes
137	15.89927663	-90.19800717	1.095	0.82542	40.54078	Yes
138	15.89919851	-90.19800940	0.448	0.73635	37.89878	Yes
139	15.89911490	-90.19801864	0.487	0.77614	37.80542	Yes
140	15.89903237	-90.19802555	1.321	0.75755	41.40784	Yes
141	15.89895313	-90.19802780	0.528	0.73032	38.12021	Yes
142	15.89887280	-90.19803237	0.486	0.77835	40.01609	Yes
143	15.89879360	-90.19803693	0.214	0.62164	39.84181	Yes
144	15.89871323	-90.19803805	0.555	0.71935	40.57857	Yes
145	15.89862957	-90.19804382	0.400	0.69194	39.08979	Yes
146	15.89854926	-90.19804955	0.449	0.68212	40.72913	Yes
147	15.89846890	-90.19805181	0.559	0.64448	40.28647	Yes
148	15.89838529	-90.19806105	0.502	0.78467	39.26041	Yes
149	15.89830831	-90.19806557	0.618	0.66790	39.06083	Yes
150	15.89822462	-90.19806904	1.323	0.65076	44.51291	Yes
151	15.89939615	-90.19792591	0.345	0.68489	40.52755	Yes
152	15.89931467	-90.19792704	0.729	0.56010	40.06539	Yes
153	15.89923102	-90.19793396	0.167	0.65522	38.61935	Yes
154	15.89915071	-90.19793969	0.307	0.78614	39.45824	Yes
155	15.89906709	-90.19794777	0.220	0.65120	38.41567	Yes
156	15.89899347	-90.19795341	0.578	0.53057	39.13238	Yes

DATE:	21-Aug-15	AREA:	1.6 Ha	FOR:
FARM:	Chiquibul	LAYER:	Tree Count Data	
FIELD:	Rio Blanco	DENSITY:	140 Palm / Ha	
CROP:	Palm	Healthy Unhealthy Attention		BY: LEADING EDGE

Tree ID	Longitude	Latitude	Tree Height (meters)	Plant Health	Temperature (Celsius)	Tree Present
157	15.89890978	-90.19795687	0.570	0.76436	39.62136	Yes
158	15.89882833	-90.19796031	0.636	0.58641	39.29895	Yes
159	15.89874797	-90.19796258	0.525	0.68920	39.09774	Yes
160	15.89866658	-90.19797063	2.490	0.58441	40.22755	Yes
161	15.89858734	-90.19797288	0.638	0.65523	39.45937	Yes
162	15.89850369	-90.19797980	0.795	0.72126	40.34678	Yes
163	15.89842454	-90.19798898	2.059	0.74670	41.84238	Yes
164	15.89834077	-90.19798552	0.714	0.66127	40.94319	Yes
165	15.89825714	-90.19799360	0.737	0.57967	41.08517	Yes
166	15.89935400	-90.19786073	0.184	0.66058	38.19586	Yes
167	15.89926915	-90.19786075	0.480	0.74020	38.49445	Yes
168	15.89918993	-90.19786416	2.553	0.74289	37.99723	Yes
169	15.89911298	-90.19787099	0.397	0.70734	37.49473	Yes
170	15.89902374	-90.19787684	1.965	0.73382	38.15379	Yes
171	15.89894337	-90.19787796	0.440	0.73198	39.24041	Yes
172	15.89886418	-90.19788367	0.783	0.67430	38.69353	Yes
173	15.89878390	-90.19789170	0.860	0.70016	38.47745	Yes
174	15.89869908	-90.19789403	0.248	0.69890	40.44350	Yes
175	15.89862545	-90.19789851	1.187	0.70304	40.09315	Yes
176	15.89854064	-90.19790200	0.564	0.70076	40.00611	Yes
177	15.89846027	-90.19790311	0.408	0.70802	38.69056	Yes
178	15.89838004	-90.19791461	0.879	0.67762	40.59601	Yes
179	15.89829970	-90.19791803	0.480	0.68259	43.43563	Yes
180	15.89821824	-90.19792146	0.188	0.64476	38.21204	Yes
181	15.89938870	-90.19778180	1.497	0.75679	39.44734	Yes
182	15.89930723	-90.19778408	0.078	0.81052	38.53986	Yes
183	15.89922689	-90.19778751	0.098	0.65306	38.29880	Yes
184	15.89914427	-90.19778750	0.040	0.72339	37.75112	Yes
185	15.89906629	-90.19780011	0.243	0.65354	39.44792	Yes
186	15.89898374	-90.19780587	0.329	0.77820	39.39269	Yes
187	15.89890233	-90.19781277	0.243	0.71621	38.01498	Yes
188	15.89882311	-90.19781617	0.378	0.81804	38.62825	Yes
189	15.89873835	-90.19782312	0.214	0.70303	38.95601	Yes
190	15.89866024	-90.19782651	0.414	0.80638	39.40032	Yes
191	15.89857545	-90.19783114	0.473	0.81368	38.95568	Yes
192	15.89849623	-90.19783455	0.091	0.78658	40.08944	Yes
193	15.89841477	-90.19783798	0.169	0.70743	39.43088	Yes
194	15.89832784	-90.19784957	2.286	0.83250	40.37944	Yes
195	15.89825077	-90.19784718	0.145	0.55645	37.45395	Yes

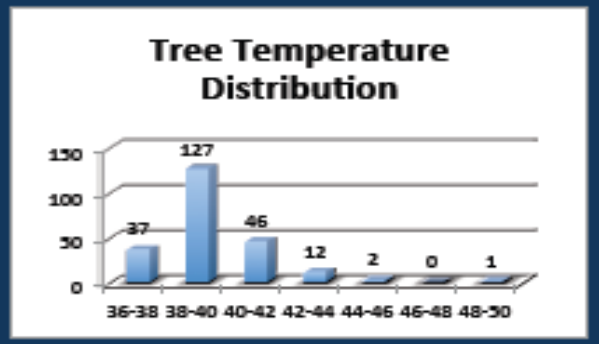
DATE:	21-Aug-15	AREA:	1.6 Ha	FOR:
FARM:	Chiquibul	LAYER:	Tree Count Data	
FIELD:	Rio Blanco	DENSITY:	140 Palm / Ha	
CROP:	Palm	Healthy Unhealthy Attention		BY: LEADING EDGE

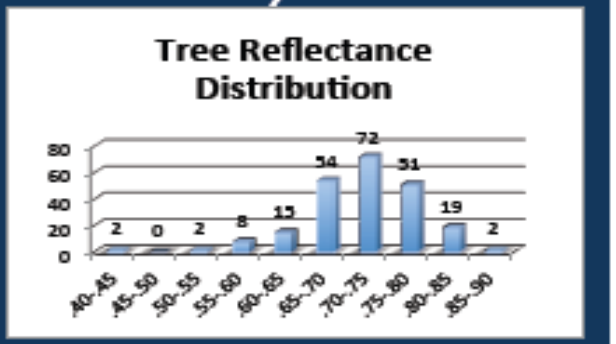
Tree ID	Longitude	Latitude	Tree Height (meters)	Plant Health	Temperature (Celsius)	Tree Present
196	15.89934644	-90.19770855	1.905	0.71599	38.43747	Yes
197	15.89926720	-90.19771080	0.474	0.67980	37.10407	Yes
198	15.89917910	-90.19771779	0.738	0.66773	37.38996	Yes
199	15.89909882	-90.19772583	0.178	0.74959	38.40005	Yes
200	15.89902299	-90.19773265	0.129	0.76637	37.58510	Yes
201	15.89894156	-90.19773839	0.238	0.77221	37.55614	Yes
202	15.89885451	-90.19774075	1.762	0.66189	37.54701	Yes
203	15.89877638	-90.19774299	0.026	0.63745	37.60811	Yes
204	15.89869497	-90.19774988	0.190	0.81783	38.20286	Yes
205	15.89861130	-90.19775450	0.420	0.78885	39.20449	Yes
206	15.89852987	-90.19776025	0.340	0.82108	40.10349	Yes
207	15.89845063	-90.19776250	0.137	0.74972	40.62921	Yes
208	15.89836700	-90.19777058	0.278	0.69168	42.35815	Yes
209	15.89828664	-90.19777169	0.113	0.64278	39.83286	Yes
210	15.89820744	-90.19777740	0.093	0.81284	40.35916	Yes
211	15.89938232	-90.19763422	2.789	0.75449	40.47921	Yes
212	15.89930307	-90.19763532	0.107	0.72485	37.91482	Yes
213	15.89921939	-90.19763994	0.134	0.74485	38.69180	Yes
214	15.89913580	-90.19765033	0.299	0.66463	41.62779	Yes
215	15.89905654	-90.19765143	0.032	0.64192	38.22541	Yes
216	15.89897512	-90.19765717	0.288	0.73391	38.94767	Yes
217	15.89889367	-90.19766176	0.141	0.76942	39.54757	Yes
218	15.89881336	-90.19766749	0.236	0.69378	38.49190	Yes
219	15.89873197	-90.19767554	0.125	0.86270	39.49499	Yes
220	15.89864712	-90.19767556	0.043	0.63038	42.85665	Yes
221	15.89856457	-90.19768132	0.115	0.74160	44.51022	Yes
222	15.89848656	-90.19769163	0.210	0.76819	42.80004	Yes
223	15.89840509	-90.19769391	1.019	0.71875	48.30793	Yes
224	15.89831921	-90.19770087	0.140	0.78161	43.37744	Yes
225	15.89823994	-90.19770081	-0.008	0.59567	42.05541	No

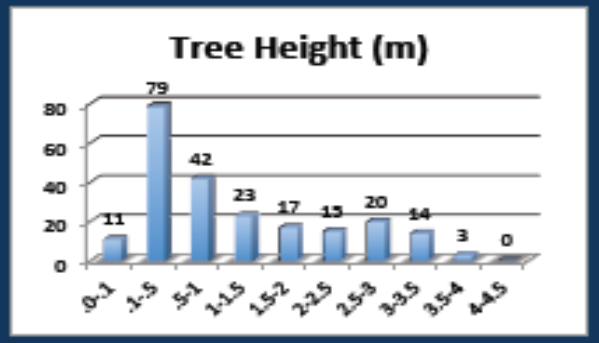
Tree Metrics Summary

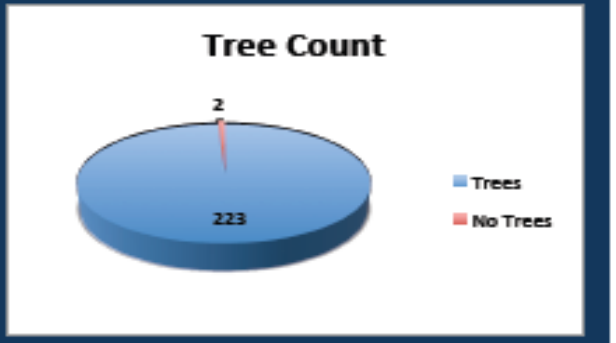
DATE:	21-Aug-15	AREA:	1.6 Ha	FOR:	
FARM:	Chiquibul	LAYER:	Tree Count Data		
FIELD:	Rio Blanco	DENSITY:	140 Palm / Ha		
CROP:	Palm			BY:	LEADING EDGE

Tree Metrics Summary









Missing Trees

Tree ID	Longitude	Latitude
122	15.8993234	-90.1980804
225	15.8982399	-90.1977008

2017 Retailer* Discount Program

*
COOP
Crop consultants
Independent retailer

- activation fee / season

$2,500 Training for 10 agronomist and integration

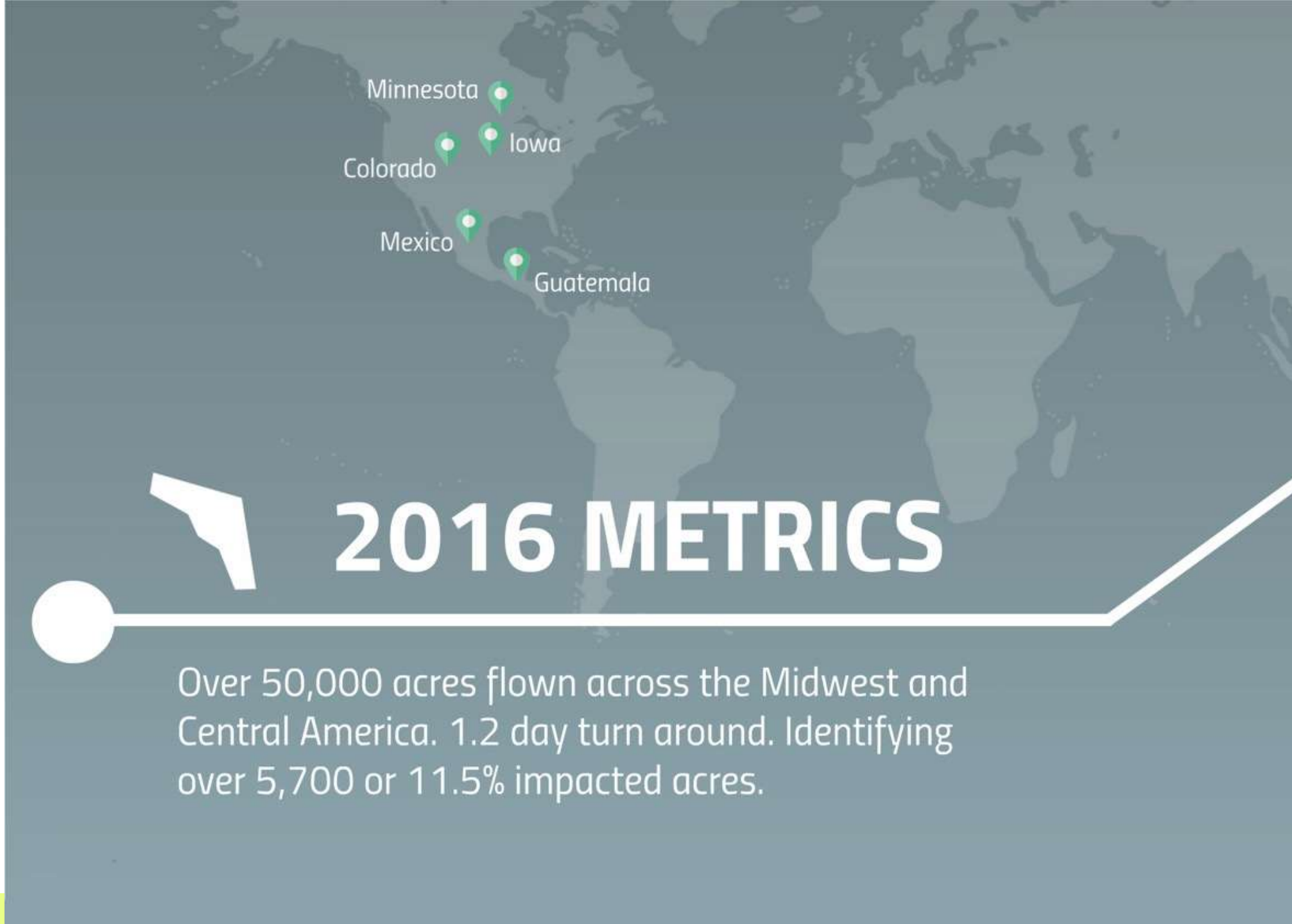
- managed volume discount

	ACRES	BASE
Tier 1	30,000	$2.00
Tier 2	25,000	2.25
Tier 3	15,000	2.50
Tier 4	10,000	2.75
Tier 5	5,000	3.00

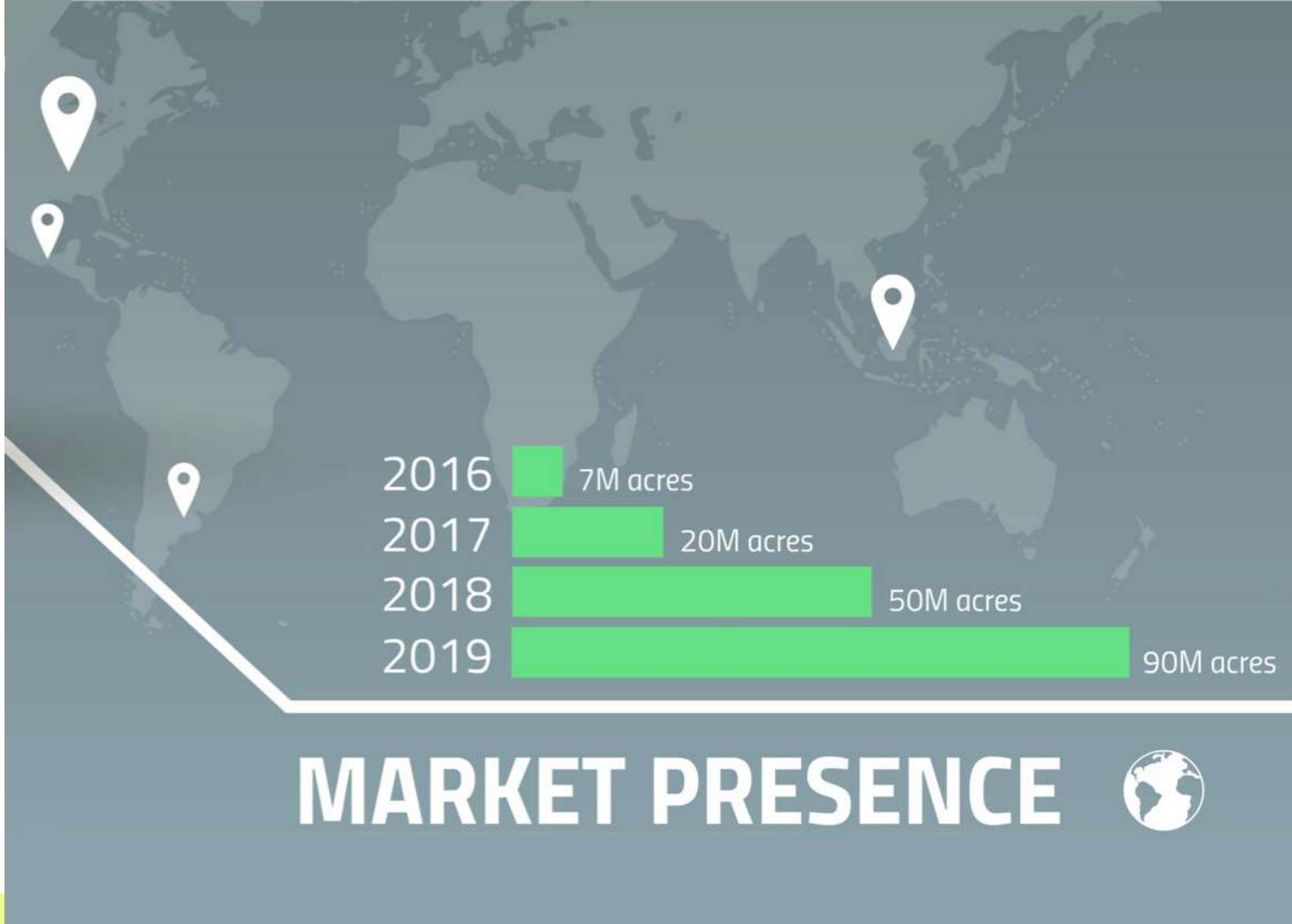
NDVI, Thermal, RGB sensors. 35% discount for same day additional flights. $250 minimum work order.

5% to 12% additional early order discount.

Aker Current Activities



Aker Projected Coverage



Aker Projected Financials

Competition

	AKER	MAVRX	PRECISION HAWK	TERRAVION	AIRSCOUT	RAPTOR MAPS	TRADITIONAL SCOUTING
UAV Flight Core Competency	**YES**	NO	YES	NO	NO	**YES**	NO
Bespoke Service	**YES**	**YES**	NO	NO	NO	**YES**	NO
High Resolution (> 6 cm/pixel)	**YES**	NO	YES	NO	NO	**YES**	NO
Seamless channel integration	**YES**	NO	NO	NO	NO	NO	**YES**
Agronomist recommendation	**YES**	YES	**NO**	NO	**YES**	NO	**YES**
24-Hour turnaround	**YES**	NO	NO	**YES**	NO	NO	**YES**
Channel Conflict - Retailer (commercial) - Supplier (research)	**NO**	YES	YES	YES	YES	YES	**NO**
Price Model	Usage	Project	Project	Usage	Project	Usage	Usage

What Customers Are Saying

This year's partnership with AKER has been a great addition to our research abilities. We tracked the scale of herbicide drift, used thermal imaging to monitor leaf deposition, track herbicide symptomology in real time and collect new data sets never before tried in our research area. With the ever changing logistics of research, the AKER team met every challenge brought to them, performed flights with amazing flexibility and quickly returned data back to our team within a matter of days. All of these factors, taken together, make the partnering of AKER the right choice for Winfield Product Development.

Ryan Edwards, PhD

Research Manager & Product Development

WINFIELD™

Thank You!

Khoo Hock Aun

+6016-301 4079

khoohockaun@gmail.com

THE GROW CENTRE

GREEN RENEWABLE ORGANIC WORLD CENTRE SDN BHD 1096665-K

COSMO BIOFUELS GROUP

Aker